



Clare County Development Plan 2023–2029

Volume 5 Clare Renewable Energy Strategy

Interim Version

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COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL



List of Acronyms

Abbreviation	Description
BER	Building Energy Rating
CSO	Central Statistics Office (Ireland)
CHP	Combined Heat and Power
CNG	Compressed Natural Gas
EMP	Energy Master Planning (Tool)
ESB	Electricity Supply Board
ETS	Emissions Trading System
EU	European Union
EV	Electric Vehicle
GHG	Greenhouse Gas (Emissions)
IEA	International Energy Agency
LEU	Large Energy User
LNG	Liquefied Natural Gas
LPG	Liquid Petroleum Gas
NECP	National Energy & Climate Plan
NEEAP	National Energy Efficiency Action Plan
NREAP	National Renewable Energy Action Plan
ORESS	Offshore Renewable Energy Support Scheme
RE	Renewable Energy
RES	Renewable Energy Strategy
RESS	Renewable Energy Support Scheme
SEAI	Sustainable Energy Authority of Ireland
WAM	With Additional Measures
WEM	With Existing Measures

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Executive Summary

The Clare County Renewable Energy Strategy (RES) outlines the renewable energy resource that is deliverable in County Clare. Its vision, consistent with that of the Clare County Development Plan 2023-2029, is to position the County as the national leader in renewable energy generation, supporting energy efficiency and conservation, with an accessible modern telecommunications infrastructure, achieving balanced social and economic development and assisting Ireland's Climate Action Plan.

The first and existing renewable energy strategy for County Clare 2014 examined all renewable energy options for the County, and set an ambitious vision for Clare to be a leader in the sector, achieving and surpassing national targets. In 2021, a progress review was carried out, providing up to date information on the energy and carbon emissions in the County. This RES enables a review of progress against the original targets.

Across the world, the response to climate change has focussed efforts on reducing greenhouse gas emissions in the energy sector. New targets are being set at EU and National level, with ambitious renewable energy requirements. This RES sets a path for Clare for the year 2030, and revises the original RES in relation to policy, targets and new technology options.

Energy and Emission Performance in 2020

The headline figures from the progress review are:

- Energy Demand has grown by 5.5% from 2010 – 2020
- Carbon Emissions have reduced by 15% in the same period.
- Electricity Generation : The total electricity demand in Clare in 2020 was 722 GWh and the total renewable electricity generated in Clare was 721 GWh. (Primarily Wind and Hydroelectric Power).
- There has been less progress with renewable heat and renewable transport energy, with Clare reflecting national trends and failing to meet targets.

Progress and Outlook for specific sectors.

	Progress to date	Outlook to 2030
Biomass and energy Crops	Clare has a significant resource and only a fraction of this potential has been developed to date. Growth in forestry and bioenergy is a national objective.	There is room for further agricultural diversification to create locally grown, low carbon fuels, and to use agricultural residues for biomethane production.
Renewable Heat	Despite a strong focus on biofuels and district heating in the existing RES, and some success with biomass boilers (e.g. Áras an Chontae) there has been limited progress in terms of large scale projects. The biomass market and supply chain did not recover from the economic downturn.	Improved government supports are now in place. Momentum is also building for district heating. This should be an area of focus into the future.
Wind Energy (onshore)	Significant progress (153MW installed). Still fell short of original target of 500MW installed capacity.	A coherent Wind Energy Strategy (WES) has been useful. A review of the WES will enable future growth to be managed (to be

		undertaken when new wind energy guidance is issued).
Solar Energy	In the first RES focus was on small scale/ rooftop installations. There has been reasonable progress in this area. Technology has improved and costs have fallen, meaning 'utility scale' projects are now proposed throughout Ireland, including in Clare.	This sector has the potential to add significant amount of renewable electricity. New targets are included for both solar farms and rooftop solar projects.
Marine Renewables	Projects relating to tidal and wave energy are being developed. No installed capacity. Overall the sector has been slower to develop internationally than first envisaged.	Clare has a strong wave and tidal resource and is in a good position to develop this. Emerging projects will be encouraged and supported.
Offshore Wind	Activity in this sector was previously focussed on the Irish Sea. Advances in the technology for floating wind turbines is opening prospects for significant offshore wind farms off the coast of Clare.	A number of projects are under development, with a view to implementation post 2030. This gives Clare a chance to plan for the necessary onshore facilities, protecting the environment and maximising local social and economic benefit.
Energy Storage	The first RES identified potential for pumped hydro electric schemes. Despite creating a favourable planning framework, this potential has not been developed. In the interim, battery technology and other forms of storage have advanced rapidly, with several permissions in place in Clare.	As the electricity grid is transformed towards 80% renewable energy, there will be a need for more energy storage projects, with a range of technologies. Using green hydrogen created from renewable electricity is a promising way to transform, store and transport energy and it has significant potential.
Renewable Transport	Progress in this area has been in line with national growth. Blending of biofuels, and a growth in EVs, has increased the share of renewable energy in transport. This sector is one where Ireland needs to make significant progress.	Accelerating the uptake of EVs, combined with greater use of biofuels and new technologies for heavy goods vehicles and public vehicle fleets, is required in Clare.
Community Owned Energy Generation, Distribution & Storage	Community ownership of energy assets was not envisaged in the first RES. However the EU directives on Clean Energy and Electricity have encouraged greater citizen / community activism.	Installation of individual and community scale renewable energy projects will make a significant contribution to Ireland's and Clare's renewable energy and carbon targets.

Community Energy

With significant support from Government, through the Sustainable Energy Authority of Ireland, there is growing momentum behind community energy. Clare is one of the leading counties for community engagement, with 22 'Sustainable Energy Communities' already established. Growth in community owned and operated renewable energy projects is anticipated. This momentum will be developed further in the period to 2030, helping to make the 'energy citizen' concept a reality.

Targets to 2030

The table below sets out the renewable energy resource targets for County Clare to 2030. It indicates that a sustainable balance of renewable energy resources is planned, ensuring that there is no over reliance or over concentration on any single technology. Details of the technologies are contained in the chapters listed.

Table 1.1: Renewable Energy Resource Targets for County Clare for 2030

Chapter	Renewable Energy Resource	County Clare	
	Accessible - Planned	GWh/y	MW
Thermal			
8	Forest wood fuel & Wood Process by-product	64.2	14.7
8	Energy Crop (SRC-Miscanthus)	87.5	20.0
12	Geothermal	34.0	15.0
10	Micro-Thermal	175.7	92.8
Sub Total		361.4	142.4
AD-CHP*thermal			
8, 14	AD - Grass Silage	20.1	2.5
8, 14	AD - Animal wastes	15.8	2.0
14	Municipal Organic MSW	25.1	3.2
10	Micro CHP	2.0	0.5
8, 12	Biomass CHP	230.0	29.2
Sub Total		293.0	37.4
Electric			
6	Onshore wind	1,590.0	550.0
9	Offshore wind		
7	Solar	226.0	300
11	Hydro	468.0	89.0
9	Wave	59.1	20.4
9	Tidal	66.1	20.0
10	Micro Gen - elec	7.2	2.1
8, 10	CHP electric	261.5	29.2
Sub Total		2,677.9	1010.7
13	Transport	204.0	29.1
Overall Total Renewable Target		3536.3	1,219.6
<i>(Of which Community and Citizen owned elements)</i>		<i>459.1</i>	<i>110.3</i>

Note:

Targets are not caps and are not intended to limit the potential for creation of renewable energy. Targets may be carried forward into subsequent renewable energy strategies if they have not been met within the lifetime of this strategy. It is not a requirement that targets for particular renewable energy technologies will be met by a single project.

This Strategy outlines the potential for a range of renewable resources, including bio-energy and anaerobic digestion, micro renewables, geothermal, solar, hydro, energy storage, onshore and offshore wind, wave and tidal energy. It acknowledges the significant contribution they can make to County Clare being more energy secure, less reliant on traditional fossil fuels, enabling future energy export and meeting assigned targets.

The targets set out in Table 1.1 are supported by a suite of objectives which seek to give certainty to potential investors and developers of renewable energy in the County. Underlying the Renewable Energy Strategy is the need to increase energy efficiency and conservation and to promote the development of micro renewable technologies. An aim of the Renewable Energy Strategy is to raise awareness of micro technologies and their advantages, together with the benefits of being more energy efficient. This Strategy recognises the importance of not only generating and supplying energy in the County by renewable means but balancing this with more energy efficient practices.

Having a strong renewable energy sector will make Clare a preferred location for investment in industry and innovation. Energy innovation can also drive employment and enterprise, enabling economic and social benefits in the County.

Chapter 1 Introduction and Vision

1.0 Introduction

The demand for energy at a global, national and local level is constantly increasing. There is a challenge to not only meet and manage this growing demand, but to do so in a secure, sustainable and efficient manner. Phasing out of fossil fuels and associated green house gas (GHG) emissions as the world seeks to address global warming. In light of this, emphasis is being placed on energy conservation, energy efficiency and the development of alternative sources of energy, namely renewable energy.

Renewable energy developments can bring economic, social and environmental benefits, such as job creation, decreased import dependency and reduced greenhouse gas emissions. However, there are also challenges associated, such as landscape and visual impacts, the availability of supporting infrastructure and competition for land-use. As a result, it is vital that clear policies and objectives are in place for renewable energy developments to ensure that they are suitably located, economical and sustainable.

Renewable energy is defined as energy developed from sources that are constantly replenished through cycles of nature and, unlike fossil fuels, are not finite. There is an abundance of renewable energy sources in Clare:

- Wind
- Solar
- Biomass (wood, waste, energy crops)
- Marine Renewables
- Microgeneration of Renewables
- Renewable Heat
- Renewable Transport
- Waste-to-Energy

Clare County Council wants to ensure that County Clare has the necessary land use and strategy framework in place to maximise its significant renewable energy resource, to provide a degree of certainty to future investors and local communities and to inform and guide the planning process for future renewable energy development. The delivery of this Strategy will be dependent on County Clare building on its existing high quality energy infrastructure. The vision of this Renewable Energy Strategy is as follows:

VISION

A County Clare that is the national leader in renewable energy generation which supports energy efficiency and conservation, and which achieves balanced social and economic development throughout the County and assists in achieving national climate change mitigation targets.

1.1 Strategic Aims

The strategic aims of this Strategy are:

- (a) To support the attainment of and to exceed in County Clare, where possible, the National targets and commitments to renewable energy.
- (b) To identify/highlight the opportunities for various renewable energy technologies and resources and identify broad areas suitable for their development in full compliance with the requirements of all environmental legislation including the

requirements of the Strategic Environmental Assessment Directive, Habitats Directive, Birds Directive and Water Framework Directive.

- (c) To provide an evidence-based strategy founded on understanding the local feasibility and potential for renewable and low carbon technology, predicated upon optimising the County's natural and socio economic, advantages and key assets, core skills, and nearby research institutes.
- (d) To maximise the opportunities for renewable energy development whilst safeguarding the environment and existing residential amenities.
- (e) To safeguard, where appropriate, areas with potential for renewable energy projects and to guide renewable energy development to preferred locations.
- (f) To set out policies and objectives for the main renewable sectors subject to Strategic Environmental Assessment (SEA) and Appropriate Assessment requirements.
- (g) To provide guidance on energy efficiency and conservation.
- (h) To promote research and development, and to foster a supportive environment for innovation and demonstration of new and emerging renewable energy systems and technologies in County Clare; to encourage collaboration between private companies, public sector, education sector and communities.
- (i) To provide a clear development management framework.

1.2 Why a Renewable Energy Strategy?

As the technology for generating renewable energy continues to develop rapidly, so too does the need for clear planning policy and objectives that are sufficiently robust and flexible for planners to respond to continuing development challenges, to ensure appropriate and sustainable development and to give a greater level of certainty to investors / developers in renewable energy technology.

It is acknowledged that Clare has the natural resources needed to maximise energy generation by renewable means. Its geographical location on the Shannon Estuary and its Atlantic coastline, coupled with a strong wind resource, undulating topography and a significant grid network, present opportunities for both on-shore and off-shore wind, wave and tidal energy, and energy storage systems. County Clare is also ideally placed to maximise the potential of bio-energy – a strong woodland resource combined with significant heat demand centres at Ennis, Shannon and Kilrush, provide a viable opportunity for combined heat and power technology in particular.

This Renewable Energy Strategy provides the necessary framework to maximise the County's renewable energy potential and to assist it in becoming an energy secure, low carbon county to meet renewable energy targets with the potential to export excess energy. This Renewable Energy Strategy aims to ensure that County Clare is an exemplar in promoting and facilitating renewable energy generation.

1.2.1 Scope of the Strategy

This Renewable Energy Strategy sets out clear objectives and targets for the above technologies and provide a development management framework that enables County Clare to position itself as a front runner in facilitating appropriately located and sustainable renewable energy technology. The Strategy sets out the Council's objectives until 2030 - a key date for Ireland to meet assigned national and European targets for renewable energy generation but also has a perspective to the longer term target of Ireland having a net zero emissions society by 2050.

This Strategy provides a valuable tool for future investors by setting out clear Council policy in relation to renewable energy generation in County Clare – type, location,

parameters, key planning issues etc. – and provides a comprehensive suite of data relating to the County’s natural resources, including off-shore wind, geothermal, solar, tidal etc. The Strategy also informs and assists the development management process in the assessment of renewable energy proposals.

The Clare County Wind Energy Strategy will form part of the Clare County Development Plan 2023-2029. Chapter 6 provides a summary of its key objectives, which are referenced for the purposes of completeness and are stated as fact in so far as they have already been adopted.

1.2.2 SEA and SEA Alternatives

The SEA process seeks to document the preparation and adoption of the Renewable Energy Strategy process where key decisions are reached, and consider the environmental impact on the policy path chosen.

Key considerations by Clare County Council in the development of each alternative strategy were identified and incorporated in the description of each alternative. The key considerations include:

- Community acceptance of energy infrastructure
- Economic impact and job creation
- Energy security and climate change
- Energy infrastructure capacity/ development
- Land use change
- Ecological and environmental impact
- Landscape characteristics

The objective of this Strategy is to meet all of County Clare’s energy needs from 100 % renewable resources. In preparing a renewable energy strategy one must decide on the renewable energy resource to be harnessed and the scale or proposed outcome of the successful delivery of such a strategy. The alternatives are:

- Alternative 1 Do nothing
- Alternative 2 Focus on energy efficiency and conservation
- Alternative 3 Mixed technologies
- Alternative 4 Single technology
- Alternative 5 Combined technologies and efficiency in demand

1.6.1 Overview of Alternatives

Full details of the over view of alternatives is set out in the SEA Environmental Report. The following is a short summary of that overview.

Alternative	Description
Alternative 1 Strategic	
Alternative 1A- Do Nothing (Business as Usual)	<p>This alternative would mean that the RES is not incorporated into the CDP. It would remain as a strategic document that would not impact on land use policy.</p> <p>For the do-nothing alternative the level and scale of renewable energy projects will be almost entirely determined by external policy at regional / national level and external market forces.</p> <p>It was considered that this alternative may have moderate community acceptance, moderate impact on energy infrastructure and land use change and it could perform poorly in terms of job creation and energy security and climate change.</p>
Alternative 1B- National Renewable targets	<p>Under this option Clare would achieve its share the national targets across renewable energy sectors (See Table 2.1 RES). More aggressive decarbonisation of heat and transport in particular are required.</p> <p>This alternative would not challenge Clare in relation to renewable electricity, but still represents a significant challenge in heat and transport sectors.</p>
Alternative 1C - Maximise Renewable Resources	<p>This option would mean the RES would go beyond the national targets to achieve greater decarbonisation, linked to enterprise and industrial development by creating a stable and reliable low-carbon energy environment. Similar to alternative 1B above, but with:</p> <p>More large-scale renewable electricity projects both onshore and offshore; more rapid decarbonisation of heat and transport; more emphasis on energy conversion and energy systems integration – e.g. using battery storage, hydrogen electrolyzers, and pumped hydro energy storage systems.</p> <p>This alternative represents a more forward looking and enterprise oriented approach to renewable energy. It would require more innovation and a willingness to accept greater levels of change in both onshore energy systems and a welcome for large scale off-shore renewables projects.</p>
Alternative 2 Temporal/Prioritisation	
Alternative 2A Onshore Priority	<p>This option would prioritise the development of onshore RE infrastructure including solar, wind, hydro, biofuels etc. As tried and trusted approaches it involves less risk and uncertainty.</p>

Alternative	Description
Alternative 2B Marine (offshore) RE Priority	This option would prioritise the development of offshore RE infrastructure and primarily focus on off-shore wind farms in combination with smaller wave and tidal installations tidal.
Alternative 2C Combination of Onshore + Planning for offshore	This option would prioritise the development of onshore RE infrastructure only including solar, wind, hydro, biofuels etc. in the short-medium term, but would plan for much more extensive offshore renewable energy in the long term (post 2030).
Alternative 3 Modal	
Alternative 3A Mixed use technology as per the existing RES	This alternative identifies a combination of familiar technologies identified in the first RES to support the renewable energy needs for County Clare under the under the 3 main target headings of Electricity (E), Heat (H) and Transport (T).
Alternative 3B Expanded Modal Scope	This alternative revises the mix of potential technologies that can deliver the RES targets, including new approaches to energy storage and conversion.
Sectoral and/or Temporal Prioritisation	
Consideration of Utility Scale Sector	This option would rely on RE infrastructure being generated from large commercial scale installations (e.g. wind, solar, biomass) supplying the electricity grid from commercial or industrial organisations.
Consideration of Community and Household Sector	From a Community perspective this option could include e.g. community owner solar, wind projects and from the Household sector could include microgeneration of renewable energy in households, with some feed-in of excess energy to the grid.
Consideration of Utility Sector and Community and Household Sector Combined	This option would consider a combination of both utility scale and commercial and household.

Overarching Objectives for Environmental Protection for all aspects of this strategy:

RES 1.1 Proposed SEA Mitigation Measures (apply to all renewable energy development)

- A. Any proposals for renewable energy infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.
- B. The EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool should be applied to inform decision-making in terms of infrastructural/siting considerations as well as consideration of environmental sensitivities.
- C. To ensure that renewable energy development proposals support and enhance the connectivity and integrity of habitats in the Renewable Energy Strategy (RES) area by incorporating natural features into the design of development proposals; and to work with infrastructure providers to co-develop infrastructural management plans to enhance biodiversity.
- D. To require any Renewable Energy project to be in compliance with the objectives and requirements of the Habitats Directive, specifically Article 6(3) and where necessary 6(4), Birds, Water Framework (including the implementation of the 3rd Cycle RBMP), and all other relevant EU Directives and all relevant transposing national legislation.
- E. To require project planning for any renewable energy project to be fully informed by ecological and environmental constraints at the earliest stage of project development and any necessary assessment to be undertaken, including assessments of disturbance to species and habitats, as required. Any ecological assessment shall also be required to consider ecological connectivity and potential supporting habitats to European Sites.
- F. To require the preparation and assessment of all planning applications for renewable energy projects to have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report, SEA Environmental Report and Strategic Flood Risk Assessment Report of the County Clare County Development Plan 2023-2029 and SEA of the Renewable Energy Strategy.
- G. Ensure that no renewable energy projects are permitted that give rise to significant cumulative, direct, indirect or secondary impacts on the integrity of European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any

other effects, (either individually or in combination with other plans, programmes, etc. or projects) (Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be: a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place).

Chapter 2 Legislation and Policy Context

The context for the Renewable Energy Strategy is set in a hierarchy of International, European and National legislation and policy which has informed the preparation of this Strategy. The following list is not exhaustive, but the main legislation and publications informing this strategy are set out below.

2.1 International Context

Kyoto Protocol

The **Kyoto Protocol** was a landmark international agreement to which 192 countries including Ireland agreed to limit worldwide greenhouse gas (GHG) emissions. The protocol was adopted and ratified in 1997 under the **United Nation Framework Convention on Climate Change (UNFCCC)**.

The Paris Agreement

Building on this, the United Nations Climate Change Conference of the parties (COP) serves as the formal meeting of the UNFCCC. The 12th December 2015, at COP21, marked the date that a legally-binding global agreement on climate change was agreed under the **Paris Agreement**. On this day, all governments agreed to a long-term goal of keeping the increase in global average temperature to well below 2°C above pre-industrial levels, and to aim to limit the temperature increase to 1.5°C. The Paris Agreement does not set a date for a peak in emissions, nor for the achievement of carbon neutrality. These targets are binding at global level but there is nothing binding for countries involved and countries can use 'sinks' such as forests to achieve these targets. The key points from COP21 include:

- Governments have agreed to 'pursue efforts' to limit warming to 1.5 °C above pre-industrial levels and parties are bound to prepare and regularly update pledges to curb emissions.
- Aim to peak in emissions as soon as possible and a long-term global goal for net zero emissions in the second half of the century. Countries can use 'sinks' such as forests to do this.
- Introduction of a review mechanism to take stock of country efforts every five years. Each pledge must be 'a progression' and 'as ambitious as possible'.
- Introduction of a mechanism to recognise and address the financial losses vulnerable countries face from climate change.
- Legal obligation on developed countries to continue to provide climate finance to help developing countries adapt to climate change and transition to clean energy.
- A "facilitative, non-intransitive and non-punitive" system of review will track countries progress.
- Establishment of a "global goal" on adaptation of "enhancing adaptive capacity", strengthening resilience and reducing vulnerability to climate change.

Additionally, *inter alia*, the Paris Agreement aims to increase the ability of countries to deal with the impacts of climate change and provides for an enhanced transparency framework for action and support. At COP25 in 2019, countries aimed to finalise the 'rulebook' for implementing the Paris Agreement and to develop guidelines on how international carbon markets will work (Article 6 of the Paris Agreement). Other focus areas were adaptation to climate impacts, loss and damage suffered by developing nations

due to climate change, finance for decarbonization and more. It was also widely seen as one of the most fractious and ultimately disappointing in terms of the progress it made. While the nations did agree to bring improved emissions reduction plans to COP26 in 2020, there was disagreement on the robustness of rules for setting up an international carbon market (Article 6).

COP26 was delayed by one year due to the Covid-19 pandemic and took place in November 2021 in Glasgow. The Glasgow Climate Pact (GCP), finalised at the end of the conference commits the Parties to an increased ambition and strengthening of emissions target to 2030 in order to align implementation to the 1.5 degrees goal of the Paris Agreement. Furthermore, a series of commitments were made to various mitigation and conservation efforts, including a deforestation pledge, a methane abatement pledge, and an agreement to end overseas financing of oil and gas projects. Increased funding support for developing nations was also agreed through the Adaptation Fund. A key achievement of COP26 was the finalising of the 'Paris Rulebook' which will allow for the full delivery of the Paris Agreement and will hold countries accountable for their emissions targets commitments. This also includes Article 6, which establishes a robust framework for countries to exchange carbon credits through the UNFCCC.

Ireland's commitment to the Paris Agreement is reflected in the ambition of the RES.

The United Nations 2030 Agenda for Sustainable Development

The 2030 Agenda for Sustainable Development is a blueprint for sustainable development for the future. At its core, are 17 Sustainable Development Goals (SDG). These recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve oceans and forests. Along with SDGs, there are targets and indicators and the Division for Sustainable Development Goals (DSDG) evaluates the systemwide implementation of the 2030 agenda. As a member of the United Nations, Ireland must display a commitment to implement the global goals. Specific SDGs that are applicable to the RES include:

- SDG 7 – Affordable and Clean Energy
- SDG 8 – Decent Work and Economic Growth
- SDG 9 – Industry, Innovation and Infrastructure
- SDG 11 – Sustainable Cities and Communities
- SDG 12 – Responsible Consumption and Production
- SDG 13 – Climate Action
- SDG 14 – Life Below Water

2.2 European Context

The **European Green Deal** is the European Commission (EC) strategy to make the EU more sustainable by 2050, recognising climate change and degradation of the natural environment as critical threats. It has an action plan, and operates across nine policy areas, three of the key areas of relevance to the RES being *clean energy*, *sustainable mobility* and *climate action*.

In 2011, the EC had developed long-term goals through the *Roadmap for moving to a competitive low carbon economy in 2050*, which states the EU's target of reducing greenhouse gas emissions by 80-95% below 1990 levels by 2050. Ultimately the long-term goal of the EU is the decarbonisation of the power sector leading to a significant requirement for an increase in the contribution of renewables to the grid. As such, European goals and targets to tackle climate and energy have been set in the form of the **EU Climate and Energy Packages**. The **EU 2030 Climate and Energy Framework** continues on from the base set out from the preceding 20-20-20 Agreement, and sets new

targets and measures to make the EU's economy and energy system more competitive, secure and sustainable. It sets out binding targets relating to GHG emissions, renewables and energy efficiency to be met by each Member State by 2030 as follows:

- At least 40% cut in greenhouse gas emissions (from 1990 levels);
- At least 32% share for renewable energy; and
- At least 32.5% improvement in energy efficiency.

In Europe, the current policies and national measures in place, if fully implemented, are expected to achieve a 45% emissions reduction by 2030. As part of the Green Deal, the EC proposed in September 2020, to increase the 2030 GHG emissions reduction target to at least 55% compared to 1990. The Green Deal consists of the following eight legislative texts which cover:

- Energy Performance of Buildings Directive (EPBD) (2018/844/EU);
- Recast Renewable Energy Directive (2018/2001/EU);
- Energy Efficiency Directive (2018/2002)
- Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action;
- Electricity Directive (EU) 2019/944;
- Regulation (EU) 2019/943 on the internal market for electricity;
- Regulation (EU) 2019/941 on risk-preparedness in the electricity sector; and
- Regulation (EU) 2019/942 establishing an EU Agency for the Cooperation of Energy Regulators.

Achieving this target requires action across all sectors. Proposals for European climate policy will need to be revised in order to achieve the 55% emission cuts by 2030. The areas to be considered include:

- EU Emissions Trading System (ETS);
- Energy Efficiency;
- Renewable Energy;
- Road transport CO₂ emissions;
- Agriculture, Land Use, Land Use Change and Forestry (LULUCF); and
- Effort Sharing.

The **2020 EU Effort Sharing Decision** commits Ireland to reducing emissions from those sectors that are not covered by the ETS (e.g. agriculture, transport, residential, non-energy intensive industry, commercial services and waste) to 20% below 2005 levels. The **Effort Sharing Regulation for 2030 (Regulation 2018/842)** sets binding annual GHG emissions targets for these sectors for the period 2021-2030. Under this regulation, Ireland must reduce its GHG emissions by 30% on 2005 levels by 2030 (or by 26.8 Mt CO₂eq).

The **Renewable Energy (RES) Directive (2009/28/EC)** established the basis for the achievement of the EU's 20% renewable energy target by 2020. Each Member State was set a binding renewable energy target, to contribute to the achievement of the overall EU goal. Ireland's overall target was to achieve 16% of gross final consumption from renewable sources by 2020. In 2019, energy from renewable sources accounted for 12%

of all energy used.¹ The provisional energy balance from 2020 indicates energy from renewable sources grew by 8.5% in 2020.² It also shows that energy use fell 12.4% in 2020, a reduction of 4.6 million tonnes of CO₂. This means that CO₂ emissions from fossil fuels used for energy were the lowest since 1993 and were 31% below 2005 levels. Oil products used for transport accounted for the largest reduction in energy use, attributable to the public health travel restrictions. The 2020 final energy balance is due to be published in September 2021.

The revised **Renewable Energy Directive (EU) 2018/2001 (recast)**, sets a target of at least 32% for renewable energy, at EU-wide level, with a review clause by 2023 for a potential upward revision of the EU level target. The **revised Energy Efficiency Directive (EU) 2018/2002** sets a target of at least 32.5% for energy efficiency, at EU-wide level. The EU Governance of the Energy Union and Climate Action Regulation³ sets the overall framework for the achievement of the EU climate and energy 2030 targets.

In this regard, the projected time horizon for the RES to 2030 and beyond is in line with EU policy and targets and will facilitate the derivation of the long-term objectives and targets aligned to EU goals.

The land use, land use change and forestry (LULUCF) sector is also increasingly being recognised as playing a large role in how GHG emissions are reported; this sector considers emissions and removals from six categories including forest land, cropland, grassland, wetland, settlements and other land. The LULUCF sector is a net carbon sink within the EU but increasing anthropogenic activities in this sector can contribute to both emissions and removals of carbon dioxide (CO₂). Due to the complexities on emissions reporting for this sector, emissions and removals from LULUCF were not counted towards the EU's 20% by 2020 GHG emissions reduction target, but count in part towards the EU's Kyoto Protocol and UNFCCC limitation of emissions and reduction commitments. **Regulation (EU) 2018/841** on the inclusion of GHG emissions and removals from LULUCF was therefore adopted in May 2018 as part of the 2030 Climate and Energy Framework. Under the regulation, Member States must ensure that GHG emissions from LULUCF are offset by at least an equivalent removal of CO₂ from the atmosphere in the period 2021-2030.

Maritime Spatial Planning (MSP) Directive (2014/89/EU)

The directive requires EU countries to draw up maritime spatial plans by March 2021. It sets out a common approach to the planning of maritime areas. The new framework seeks to promote the sustainable:

- Growth of maritime economies, known as the EU's Blue Economy;
- Development of marine areas;
- Use of marine resources.

A marine spatial plan was prepared by the DHLGH and published in June 2021.

¹ Data and Insights-SEAI Statistics, SEAI (2021)| [Accessed 02/06/2021]

² SEAI Data and Insights-SEAI Statistics, SEAI (2021) | [Accessed 02/06/2021]

³ Regulation (EU) 2018/1999 of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

2.3 National Context

The **National Policy Position on Climate Action and Low Carbon Development (2014)** sets a fundamental national objective to achieve the transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050. In 2015, the government White Paper ***Ireland's Transition to a Low Carbon Energy Future, 2015-2030*** set the overall high-level framework for energy policy in Ireland out to 2030.

Table 2.1 Carbon Reduction Targets at EU and National Level

CO ₂ Target	Target 2020	Target 2030	Target 2050
National	20% reduction (2005)	51% reduction (2018/20)	Climate Action Bill (2021, 2023), commits to Ireland becoming Carbon Neutral by no later than 2050.
European	20% reduction (1990)	40% reduction (1990) - likely increased "the Commission proposes to raise to at least 55% (1990)"	Carbon-Neutral

The **Climate Action and Low Carbon Development Act (2015)** provides for the approval of plans by the government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy, as well as to establish the Climate Change Advisory Council. The **Climate Action and Low Carbon Development (Amendment) Act (2021) was enacted in July 2021** and aims to support the country's transition to achieve a climate neutral economy by 2050. It sets out legally binding, clear targets and commitments to meet the national, EU and international climate goals and obligations. Key elements contained within the bill, include:

- Places on a statutory basis a 'national climate objective', which commits to pursue and achieve no later than 2050;
- Embeds the process of carbon budgeting into law;
- Actions for each sector will be detailed in the Climate Action Plan, updated annually;
- A National Long Term Climate Action Strategy will be prepared every five years;
- Government Ministers will be responsible for achieving the legally-binding targets for their own sectoral area with each Minister accounting for their performance towards sectoral targets and actions before an Oireachtas Committee each year;
- Strengthens the role of the Climate Change Advisory Council, tasking it with proposing carbon budgets to the Minister;
- Provides that the first two five-year carbon budgets proposed by the Climate Change Advisory Council should equate to a total reduction of 51% emissions over the period to 2030, in line with the Programme for Government commitment;
- Expands the Climate Change Advisory Council from eleven to fourteen members, and provides that future appointments to the Council provide for a greater range of relevant expertise and gender balanced;
- Introduces a requirement for each local authority to prepare a Climate Action Plan, which will include both mitigation and adaptation measures and be updated every

- five years. Local authority Development Plans will also align with their Climate Action Plan; and
- Public Bodies will be obliged to perform their functions in a manner consistent with national climate plans and strategies, and furthering the achievement of the national climate objective.

Furthermore, the revised Climate Bill proposes to ban oil and gas extraction. This would end the prospecting of fossil fuel and the future development of oil and gas fields in Ireland. A separate ban is proposed on the processing of imported fracked gas in liquefied natural gas (LNG) terminals and is to come under separate legislation.

The **Governance of the Energy Union and Climate Action Regulation (EU) 2018/1999**⁴ requires Member States to develop a **National Energy and Climate Plans (NECP)**. Ireland submitted a draft Plan to the EC in December 2018. In accordance with the Regulation, the EC and Ireland engaged in an iterative process and finalised the **NECP 2021-2030** in 2019. The aim of the NECPs is to provide an integrated policy framework for the period up to 2030 to ensure regulatory certainty and a coordinated approach among Member States. The final NECP set an ambitious target for RES-E for 70% by 2030.⁵

Climate Action Plan

Ireland's **Climate Action Plan (DCCAE, 2019)** outlined the challenges across key sectors including electricity, transport, built environment, industry and agriculture and introduced a co-ordinated approach towards ambitious decarbonisation targets which would enable Ireland to meet its EU targets to reduce its carbon emissions by 30% between 2021 and 2030 and lay the foundations for achieving net zero carbon emissions by 2050 (now superseded by revised targets of 51% reduction by 2030, see Bill of 2021 above). The **Interim Climate Actions 2021** was also published on 23 March 2021. It contains 250 climate actions for delivery, broken down into 561 measures. Responsibility for their delivery is split across 13 Government Departments and over 35 Agencies. **Interim Climate Actions 2021** formally replaces the Annex of Actions published under the Climate Action Plan 2019. The First Progress Report demonstrates a 78% delivery rate for Q1 2021, with 78 of the 100 measures due delivered on schedule. The need to overcome any delays in climate action implementation is clear, with further scientific and policy developments underscoring the need for urgent climate action.⁶

The **Climate Action Plan 2021 (DECC, 2021)**, required under the Climate Action and Low Carbon Development (Amendment) Act 2021, was published in November 2021 and provides a sectoral roadmap to delivering the national climate objective. This Plan replaces the Climate Action Plan (2019) and commits €125 billion of capital investment in low-carbon technologies and infrastructure up to 2030. The Plan identifies 475 actions across all sectors and commits to a more ambitious delivery of renewable energy as well as a focus on the Built Environment and Transport objectives. The plan also includes a commitment to deliver a just transition and includes supports and actions to maximise

⁴ Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

⁵ Houses of the Oireachtas (March 2019) Report of the Joint Committee on Climate Action. *Climate Change: A Cross-Party Consensus for Action*.

⁶ Interim Climate Actions 2021 - Progress Report, Government of Ireland (2021) [Accessed 02/06/2021]

citizen engagement with the Plan including the establishment of the National Dialogue on Climate Action (NDCA)⁷.

The **Climate Action Plan 2023 (DECC, 2022)** is the second annual update to Ireland's Climate Action Plan (2019). It builds on the previous climate action plans and is the first plan to implement economy-wide carbon budgets and sectoral emissions ceilings agreed in July 2022. The updated Climate Action Plan focuses on how to achieve the required system change across society and the economy. The plan requires, by 2030, a 75% reduction in electricity sector emissions, 45% reduction in commercial/public buildings emissions, a 40% reduction in residential buildings emissions, 50% reduction in transport sector emissions, 35% reduction in industry emissions and 25% reduction in agricultural emissions. The plan requires a large-scale deployment of renewables and includes an acceleration of the delivery of onshore wind to 9GW, solar energy to 8GW and offshore wind to at least 5GW. In addition, the plan outlines support for at least 500MW of local community-based renewable energy projects and increased levels of micro-generation and small-scale generation.

The **Governance of the Energy Union and Climate Action Regulation (EU) 2018/1999** requires Member States to develop a **National Energy and Climate Plans (NECP)**. Ireland submitted a draft Plan to the EC in December 2018. In accordance with the Regulation, the EC and Ireland engaged in an iterative process and finalised the **NECP 2021-2030** in 2019. The aim of the NECPs is to provide an integrated policy framework for the period up to 2030 to ensure regulatory certainty and a coordinated approach among Member States. The final NECP set an ambitious target for RES-E for 70% by 2030.⁸

Project Ireland 2040

The **National Planning Framework (NPF)** and the **National Development Plan (NDP)** are at the top of the spatial planning hierarchy in Ireland and are the Government's high-level plan for the future development of Ireland, with a particular focus on strategic growth and infrastructure; together they make up "**Project Ireland 2040**".

Number eight of the ten National Strategic Outcomes (NSO's) in Project Ireland 2040, is to facilitate a *Transition to a Low Carbon and Climate Resilient Society*. The capital investment priorities arising from this strategy represent a major change in Ireland's delivery of climate-action objectives to achieve sufficient reductions in carbon emissions during the period to 2030. Investment priorities include:

- Upgrading of 45,000 homes a year from 2021;
- An additional 3,000-4,500 MW of renewable energy;
- Full rollout of the Renewable Heat Support Scheme;
- Transition to low-emission (including electric) buses for the urban bus fleet; and
- A target of 500,000 electric cars by 2030.

Project Ireland has committed to an investment of €22 billion towards climate action over the coming decade, with the National Development Plan (NDP) allocating a further €8.6 billion for investments in sustainable mobility. The **Climate Action Fund** was also launched in 2018, with €500 million supporting the delivery of projects up until 2027.

⁷ Climate Action Plan 2021 – Securing Our Future | <https://www.gov.ie/en/publication/55fde-climate-action-important-publications/#climate-action-plans>

⁸ Houses of the Oireachtas (March 2019) Report of the Joint Committee on Climate Action. *Climate Change: A Cross-Party Consensus for Action*.

The Clare Renewable Energy Strategy (RES) is cognisant of these targets set out under Project Ireland 2040. In particular, decarbonising the various sectors e.g. electrification of transport, can only be achieved if there is a proportional increase in electricity generated from renewable sources to offset increased demands on the sector. This will include new offshore wind farms but also increased penetration of onshore wind and solar energy.

Alongside Project Ireland 2040, the government published a climate action investment strategy, **Investing in the Transition to a Low-Carbon and Climate-Resilient Society 2018-2027 (June 2018)**.

The **2020 Programme for Government (PfG)** contains a number of key policy commitments on climate change, including a legal target of an average of a 7% reduction in carbon emissions per annum from 2021 to 2030 achieving a 51% reduction in CO₂. A future proposal is for a target of net zero emissions by 2050. It outlines the potential for at least 30GW of offshore floating wind power which could be deployed in the deeper waters of the Atlantic.

National Marine Planning Framework

A related plan is Ireland's **National Marine Planning Framework [NMPF]** which represents Ireland's first step in developing marine spatial planning in Ireland. A marine spatial plan is required under the **Maritime Spatial Planning Directive (2014/89/EU)** and was prepared by the DHLGH and published in June 2021. The NMPF will stand as a parallel framework to the terrestrial NPF in order to fully align spatial planning. The RES has regard to the objectives of the NMPF and the associated environmental assessments as they relate to coastal, transitional and marine areas.

Part 5 of the Planning and Development (Amendment) Act 2018 re-transposes the Maritime Spatial Planning Directive (2014/89/EU) in legislation and contains a number of measures that are additional to those required by the Directive and include:

- Adoption of the National Marine Planning Framework (NMPF) by both Houses of the Oireachtas;
- Review and replacement of the NMPF every 6 years;
- Obligation for marine regulatory bodies to secure the objectives of the NMPF when making policies, plans, or granting consents; and
- Enforcement powers for the Minister if the foregoing obligations are not being fulfilled.

Renewable Electricity Support Scheme

The **Renewable Electricity Support Scheme (RESS)** is a key deliverable on Ireland's transition to its low carbon future. The RESS aims to provide support to renewable electricity projects in Ireland with a focus on cost-effectiveness, and targets the delivery of a broader range of policy objectives, including:

- An enabling framework for community participation through the provision of pathways and support for communities to participate in renewable energy projects;
- Increasing technology diversity by broadening the renewable electricity technology mix (the diversity of technologies);
- Delivering an ambitious renewable electricity policy to 2030; and
- Increasing energy security, energy sustainability and ensuring the cost effectiveness of energy policy.

The RESS will provide financial support to renewable electricity projects in Ireland, and will provide for a RES-E ambition of up to a maximum of 55% by 2030, subject to

determining the cost-effective level which are set out in the NECP 2021-2030. The first RESS auction (RESS-1) took place concluded in 2020.⁹ The final auction results were published by EirGrid 2020. Of the eighty-two successful projects (63 solar and 19 wind), two on-shore wind projects are located in Clare. Seven community energy (five solar; and two wind) projects have been successful in RESS 1. These projects are located across three provinces in counties Clare, Kilkenny, Galway, Mayo, Wexford and Cork. The projects will be owned in the majority by communities and the revenues from operation will be cycled back into those communities. The RESS-2 auction was launched by Government in October 2021 and applications will open in December 2021 with final auction results to be announced in June 2022. The RESS-2 design is broadly similar to RESS-1 with additional technology diversity to include the coupling of battery storage with renewables and a stipulation projects participating in the community led sector must be 100% community owned.

Wind Energy Development Guidelines (WEDG's)

The **Wind Energy Development Guidelines [WEDG's] (2006)**, issued under Section 28 of the Planning and Development Act [PDA] 2000 (as amended) set out advice to planning authorities on planning for wind energy through the development plan process and in determining applications for planning permission. The guidelines aimed to ensure consistency of approach throughout the country in the identification of suitable locations for wind energy development. In December 2019, the then-named Department of Housing, Planning and Local Government (DHPLG) published **Draft Revised WEDG's (2019)** which aim to establish clearer guidance to facilitate the achievement of wider renewable energy targets while considering community, spatial planning, energy policy, environmental, technological and industry issues that need to be balanced. The "preferred draft approach" focuses on several key aspects including:

Sound/ Noise;

Visual Amenity Setback;

Shadow Flicker;

Consultation Obligations;

Community Dividend; and

Grid Connections.

The Government are currently working on a new set of revised guidelines due to be published in 2024. Once finalised, the Revised WEDG's will be issued under the PDA and will apply to planning applications and considerations for future wind energy development proposals.

Offshore Renewable Energy Plan (OREDPP)

Ireland's Offshore Renewable Energy Plan (OREDPP) establishes a framework for the sustainable development of Ireland's offshore renewable energy potential. Under the OREDPP, Ireland is developing a suite of world class test infrastructure to encourage the development of our offshore renewable energy potential.¹⁰ The plan, published in 2014 by

⁹ Renewable Electricity Support Scheme (RESS), Government of Ireland (2021) | <https://www.gov.ie/en/publication/36d8d2-renewable-electricity-support-scheme/> (Accessed 01/06/2021)

¹⁰ Offshore Renewable Energy Development (OREDPP) – Interim Review, DOECC (2018) | <https://www.gov.ie/en/publication/e13f49-offshore-renewable-energy-development-plan/> (Accessed 02/06/2021)

the Department of Communications, Energy and Natural Resources (now the Department of the Environment, Climate and Communications (DECC)) commits to an interim review in 2017, with a full review to be carried out in 2020. The interim report indicates that the OREDP is generally still fit for purpose given the low level of activity to date, anticipated activity out to 2020, and the state of play of technology development.¹¹ In 2022, the Government began the process of developing a second Offshore Renewable Energy Plan (OREDP-II), due to be published in 2023.

In October 2021 the Government launched the first consultation on the Offshore Renewable Energy Support Scheme (ORESS-1) with the aim to engage stakeholders before the launch of the scheme which will see three auctions deliver up to 5 GW of off-shore wind energy projects.

2.3.1 Specific targets for Renewable Energy in Electricity, Heat and Transport

Article 4 of the **Renewable Energy Directive (2009/28/EC)** required Ireland to adopt a **National Renewable Energy Action Plan (NREAP)**. Ireland's plan was submitted to the Commission in 2010 and established that the 16% RES target in 2020 would be delivered by achieving three modal targets as follows:

- 40% renewable share of electricity use (RES-E);
- 12% share of renewable heat (RES-H); and
- 10% renewable share of transport energy (RES-T).

Progress to date in Ireland, renewable energy represented 13.6% of gross final consumption in 2021. The RES-E share in 2009 of 13.7% has risen to 38.1% in 2021. This trend suggests a circa 3% increase per annum and continuing at pace. The RES-H share was 6.17% in 2021, compared to the 12% target, while the RES-T share was 8.9 % in 2019 compared to the 10% target. A new methodology for the calculation of RES-T is in place since 2021 and Ireland's RES-T share was 4.3% versus a target of 14% by 2030. Transport has the largest share of energy consumption in Ireland but the smallest share of renewable energy. Ireland's overall renewable energy contribution was 13.5% in 2020 and 13.6% in 2021 versus a target of 16%. **Table 2.** shows the renewable energy targets by mode in Ireland.

Looking ahead to 2030, the proportion of energy from renewable sources will have to dramatically increase to meet EU targets under the **Renewable Energy Directive 2018/2001/EU**¹², which is part of the **EC's Clean Energy for All Europeans Package**, and which are to be incorporated as part of Member States' NECPs. The Renewable Energy Directive is currently being further revised to accelerate the take-up of renewables and deliver the urgent emission cuts that are required to meet the EU's increased climate ambitions. It is expected this EU target will be further increased to 45% by 2030 from the current target of 32%. While the national target has not yet been finalised, **Table 2.2** below presents a possible set of targets across electricity, heat and transport sectors, following the 'With Additional Measures' projection set out in the NECP 2021-2030.

Table 2.2 National Renewable Energy Targets

¹¹ Offshore Renewable Energy Development (OREDP) – Interim Review, DOECC (2018) | <https://www.gov.ie/en/publication/e13f49-offshore-renewable-energy-development-plan/> (Accessed 02/06/2021) (Accessed 02/06/2021)

¹² Renewable Energy Directive, EU Science Hub (2019) | <https://ec.europa.eu/jrc/en/jec/renewable-energy-recast-2030-red-ii> (Accessed 02/06/2021)

RES Target	Ireland 2019 (%)	Target 2020 (%)	Possible Target 2030 (%) ¹³
Overall RES Target	12	16	34.1
RES-E	36.5	40	80
RES-H	6.3	12	24
RES-T	8.9	10	13.4

2.3.2 Further Policies and Targets

In 2018, the Government published the statutory **National Adaptation Framework (NAF)** which sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. Under the Framework, Government Departments are required to prepare **Sectoral Adaptation Plans (2018/2019)** for key sectors. Local Authorities will also be preparing Adaptation Strategies and the Framework provides a basis for local authorities and key sectors to assess their key climate risks and vulnerabilities while enabling climate resilience actions to be mainstreamed into all local, regional, and national policymaking. The **Climate Change Adaptation Plan for the Electricity and Gas Networks Sector** was published by DCCAE in February 2018. It is a high-level plan which outlines the initial research and analysis on the likely effects of climate change on these sectors and sets out possible actions to develop resilience.

The **National Policy on Alternative Fuels Infrastructure for Transport 2017-2030** was published by DTTAS reiterating the cornerstones of Irish transport policy which includes key goals such as reducing reliance on fossil fuels and reducing transport emissions. Utilising alternative fuels is a key aspect of this and for contributing to decarbonisation of the electricity sector. It outlines the main fuel options that could provide alternatives to oil in transport namely: electricity, hydrogen, biofuels, and natural gas, in the forms of compressed natural gas (CNG), liquefied natural gas (LNG), and liquefied petroleum gas (LPG). Ireland set an initial target in 2008 of converting 10% of its passenger and light commercial vehicle stock to electric vehicles by 2020 (roughly equivalent to 230,000 vehicles).

As the uptake of EVs was lower than anticipated, this target was revised to 50,000 in Ireland's **third National Energy Efficiency Action Plan (NEEAP)** published in 2014. The target for EV uptake was revised to 20,000 electric vehicles by 2020 by this framework, which is reflected in **NEEAP 4**. In line with the ambition of the NDP, the EV stock reached approximately 500,000 by 2030.¹⁴

The **amending EU Directive on Energy Efficiency (2018/2002)** sets a collective EU efficiency target of at least 32.5% for 2030, with the NECP 2021-2030 aiming to contribute to this through a suite of measures including in the public sector and in buildings, among others.

The use and specification of biofuels in the transport sector is dictated by the **Renewable Energy Directive (2009/28/EC)** and the **Fuel Quality Directive (2009/30/EC)**. Under Article 3(4) of the Renewable Energy Directive, Ireland is committed to ensuring

¹³ Table 5, National Energy and Climate Plan 2021-2030, DOECC (2021) https://ec.europa.eu/energy/sites/ener/files/documents/ie_final_necp_main_en.pdf [Accessed 04/06//2021]

¹⁴ National Energy Projections to 2030, SEAI | <https://www.seai.ie/publications/National-Energy-Projections-to-2030.pdf> [Accessed 04/06//2021]

that at least 10% of energy consumption in the transport sector is achieved from renewable sources by 2020.

In 2015, new rules came into force that amended these Directives to reduce the risk of indirect land use change and to prepare the transition towards advanced biofuels. The amendment:

- Limits the share of biofuels from crops grown on agricultural land that can be counted towards the 2020 renewable energy targets to 7%.
- Proposes a specific sub-target of at least 0.5% for advanced biofuels in road and rail energy from 2021, rising to 3.6% in 2030.
- Requires that biofuels produced in new installations emit at least 60% fewer GHGs than fossil fuels.
- Introduces stronger incentives for the use of renewable electricity in transport.

2.4 Regional Context

Each of the three regional assembly areas has a **Regional Spatial and Economic Strategy (RSES)**: Eastern & Midland, Southern, and Northern & Western. One of the principle functions of the RSES's is to practically support and advance the delivery of the national policy objectives contained in the National Planning Framework (NPF) at the regional level, and to inform lower-level planning (such as County Development Plans).

The three regional assemblies will bring forward the NPF in a manner which best reflects the challenges and opportunities of their respective regions. It has been anticipated by the NPF that each of the three regional assemblies will begin to fill out the national policy objectives, in some cases giving them geographic or temporal context and in other cases elaborating on project concepts. The RSES's will support the delivery of the NPF removing the top-down perception and replacing it with a shared responsibility and understanding.

The Southern Region's Strategy is to build a low carbon, climate resilient and sustainable society. It contains the following key relevant Regional Policy Objectives (RPOs) in relation to Renewable Energy outlined in detail:

RPO 95 - Sustainable Renewable Energy Generation

- It is an objective to support implementation of the National Renewable Energy Action Plan (NREAP), and the Offshore Renewable Energy Plan and the implementation of mitigation measures outlined in their respective SEA and AA and leverage the Region as a leader and innovator in sustainable renewable energy generation.

RPO 96 - Integrating Renewable Energy Sources

- It is an objective to support the sustainable development, maintenance and upgrading of electricity and gas network grid infrastructure to integrate renewable energy sources and ensure our national and regional energy system remains safe, secure and ready to meet increased demand as the regional economy grows.

RPO 97 - Power Stations and Renewable Energy

- It is an objective to support the sustainable technology upgrading and conversion of power stations in the Region to increase capacity for use of energy efficient and renewable energy sources.

RPO 98 - Regional Renewable Energy Strategy

- It is an objective to support the development of a Regional Renewable Energy Strategy with relevant stakeholders.

RPO 99 - Renewable Wind Energy

- It is an objective to support the sustainable development of renewable wind energy (on shore and offshore) at appropriate locations and related grid infrastructure in the Region in compliance with national Wind Energy Guidelines

RPO 100 - Indigenous Renewable Energy Production and Grid Injection

- It is an objective to support the integration of indigenous renewable energy production and grid injection.

RPO 101 - International Hub for Energy Innovation

- It is an objective to support continued innovation and research in the energy sector and to develop a role as an international hub for energy innovation.

RPO 102 - Energy Research Funding

- It is an objective to support initiatives for energy research funding within our Region to accelerate diversification away from fossil fuels to green energy, including the potential of wind, wave, solar, biomass, biofuels, biogas and hydrogen in the Region.

RPO 103 - Interconnection Infrastructure

- It is an objective to support the sustainable development of interconnection infrastructure, in particular the potential for the sustainable development of an international connection between Ireland and France in the Region.

RPO 104 - Energy Storage and Carbon Capture

- It is an objective to support investment in initiatives to develop innovation, advances in technology and pilot projects for the sustainable development of energy storage and carbon capture within the Region and to work with key stakeholders in developing sustainable forestry, including initiatives for native tree planting and better management of peatland and soil management to support carbon sequestration and enhancement of biodiversity.

RPO 105 - Clean Electric Heat Technologies & District Heating

- It is an objective to support development of district heating schemes by promoting innovation in the use of recoverable heat sources and related technologies. The development of new low carbon heat sources should include non-fossil fuel heat sources including clean electric and renewable gas heat technologies in the Region.

RPO 106 - Future Proofing and Retrofitting

- It is an objective to support implementation of the National Energy Efficiency Action Plan, the implementation of mitigation measures outlined in their respective SEA and AA and investment in initiatives to improve energy efficiency and future proof our Region's residential, commercial, industrial, agricultural and public building stock, including retrofitting in urban and rural areas and reduce fuel poverty. RSES supports the promotion of sustainable buildings that achieve certification under systems such as the Home Performance Index, Leadership in Energy and Environmental Design at local authority level.

Other relevant RPOs are those listed below:

- RPO 41 - Atlantic Economic Corridor (AEC)
- RPO 56 - Low Carbon Economy
- RPO 57 - Bio-economy
- RPO 58 - Bio-economy and Rural Areas
- RPO 76 - Marine Economy
- RPO 77 - Maritime Spatial Planning Consistency and Alignment
- RPO 78 - First Mover under the National Marine Planning Framework
- RPO 79 - Shannon Estuary and Other Harbour Plans
- RPO 80 - Marine Resource and Blue Economy
- RPO 85 - Renewable Offshore Energy
- RPO 87 - Low Carbon Energy Future
- RPO 89 - Building Resilience to Climate Change
- RPO 91 - Decarbonisation in the Transport Sector
- RPO 92 - Electric Vehicle Infrastructure
- RPO 93 - CNG & EV Infrastructure
- RPO 94 Decarbonisation in the Agricultural Sector
- RPO 108 - EU Action Plan for the Circular Economy

- RPO 109 - Bio-Energy Implementation Plan

Strategic Integrated Framework Plan for the Shannon Estuary (SIFP) 2013-2020

The **Strategic Integrated Framework Plan for the Shannon Estuary (SIFP) 2013-2020** is “an inter-jurisdictional land and marine based framework plan to guide the future development and management of the Shannon Estuary”. The aim of this plan is to identify the potential nature and location of future development, economic growth and employment that can be sustainably accommodated within the Shannon Estuary whilst protecting the environmental sensitivities of the area. The plan also identifies the potential of the estuary for renewable energy development. The RES should therefore have regard to the SIFP in developing its objectives.

2.5 County Context

Clare County Development Plan 2023 -2029 – Volume 6 – Clare Wind Energy Strategy.

The Wind Energy Strategy forms part of the Clare County Development Plan. Refer to Chapter 6 of this Strategy for more details.

County Clare Climate Adaptation Strategy, 2019-2024

Clare County Council has adopted an Adaptation Strategy that the Council will implement to adapt to the effects of climate change and to safeguard the biophysical infrastructure and well being of the people and communities of County Clare. The strategy has been developed in accordance with the 2018 Local Authority Adaptation Strategy Development Guidelines which set out a road map for local authorities and ensure a consistent approach across the sector.

The document strategy sets out the high level vision on how we will transition to a low carbon climate resilient future by adapting a wide range of actions across the different Directorates to adapt to the challenges of climate change. The strategy will be dynamic and flexible to respond quickly to the threats and opportunities that will face the local authority in the coming years

Chapter 3 Energy Profile of County Clare

3.0 Strategic Aims

- To present the current performance of County Clare in relation to energy consumption, renewable energy generation, and greenhouse gas emissions.

3.1 Introduction

This section presents data and outlines key trends in the energy profile of County Clare, in terms of both energy consumption and CO₂ emissions. It investigates whether County Clare has the resources and potential to meet its energy needs from 100% renewable sources. It stresses the importance of energy efficiency as the first pillar in the move to a low carbon society. The evidence based data presented in this chapter has been used to inform the targets for the sectors based on either meeting the demand for energy in County Clare or exceeding demand, through the provision of renewable energy.

3.1.1 Evolution of County Clare's Current Energy Consumption

County Clare has a proud heritage of harnessing natural resources through strategic energy infrastructure. In 1929, County Clare harnessed the hydroelectric power of the River Shannon at Ardnacrusha and was supplying over 80% of the Country's electricity needs from renewable resources.

County Clare, by reason of its abundant natural resources and significant existing infrastructure available, remains in an ideal position to continue the development of renewable energy resources (electrical and thermal) and to deliver them to the national and international markets.

3.2 County Clare's Energy Needs

A new Clare Energy and Emissions Balance for 2021 has been prepared in order to provide the necessary up to date evidence base to identify the County's future energy needs for the purpose of preparing this RES.

In March 2012 the Limerick Clare Energy Agency published the '*Clare Energy & Emissions Balance*' for 2010. This report identifies the amount of energy consumed in County Clare, excluding the large energy consumers¹⁵. In 2021, the Energy and Emissions Balance was prepared using the same methodology which updated energy needs to 2020 and predicts ahead to 2030 based on NECP with added measures scenario (WAM)¹⁶.

The following table describes County Clare's energy needs in three categories for 2020, 2030, and 2050. Thermal energy, in simple terms, is the energy generated through the heating of matter. Electric energy is the presence and flow of an electric charge, i.e. electricity. Transport energy refers to the energy consumed by the transportation sector (HGV's, cars, rail, etc.)

Table 3.1 indicates that energy needs in County Clare are expected to fall by 2030, assuming the country implements energy efficiency actions in line with the National Energy

¹⁵ Those consumers authorised to hold Kyoto units in an account on Ireland's National Emission Trading Registry

¹⁶ National Energy Climate Action Plan, DECC (2021)

Climate Plan. Table 5.2, in Chapter 5 outlines the National Energy Efficiency Action Plan targets by sector.

Table 3.1 County Clare Energy Consumption by Use¹⁷

County Clare	2020	2030	2050
Total Final Energy Demand	GWh/y ¹⁸	GWh/y	GWh/y
Thermal Energy	1,507	1,041	1,162
Electric Energy	722	914	1,297
Transport	1,427	1,299	1,041
Total Final Energy Use	3,656	3,254	3,500

Table 3.2 shows the existing and predicted future evolution of energy consumption in County Clare from 2000 to 2020 by energy sector. Note that Table 3.2 does not include large energy users in County Clare that are in the Emissions Trading Scheme administered by the Environmental Protection Agency (EPA). This data is illustrated in Figure 3.1 below. The width of the bands reflects the level of energy use for that sector. As can be seen, the grey (transport) and brown (residential) bands are the widest, clearly showing that the majority of energy use is consumed by these sectors.

Table 3.2 County Clare Evolution of Energy Consumption 2000 to 2020

(All figures in GWh/y)

Year	Agriculture	Commercial	Industry	Residential	Transport	Total
2000	175	374	902	768	983	3202
2005	212	404	882	984	1,380	3862
2010	162	395	692	1,072	1,167	3489
2015	153	418	679	829	1,155	3234
2020	189	455	812	772	1,427	3656

¹⁷ Clare Energy and Emissions Balance Update 2021)

¹⁸ Gigawatt hours per year. A gigawatt hour is a measurement of energy quantity. One gigawatt hour is equal to one million kilowatt hours. It provides an amount of energy which could power approximately 200 homes for a period of one year.

Figure 3.1 Evolution of Energy Consumption by Sector in County Clare by Sector

(All figures in GWh/y)

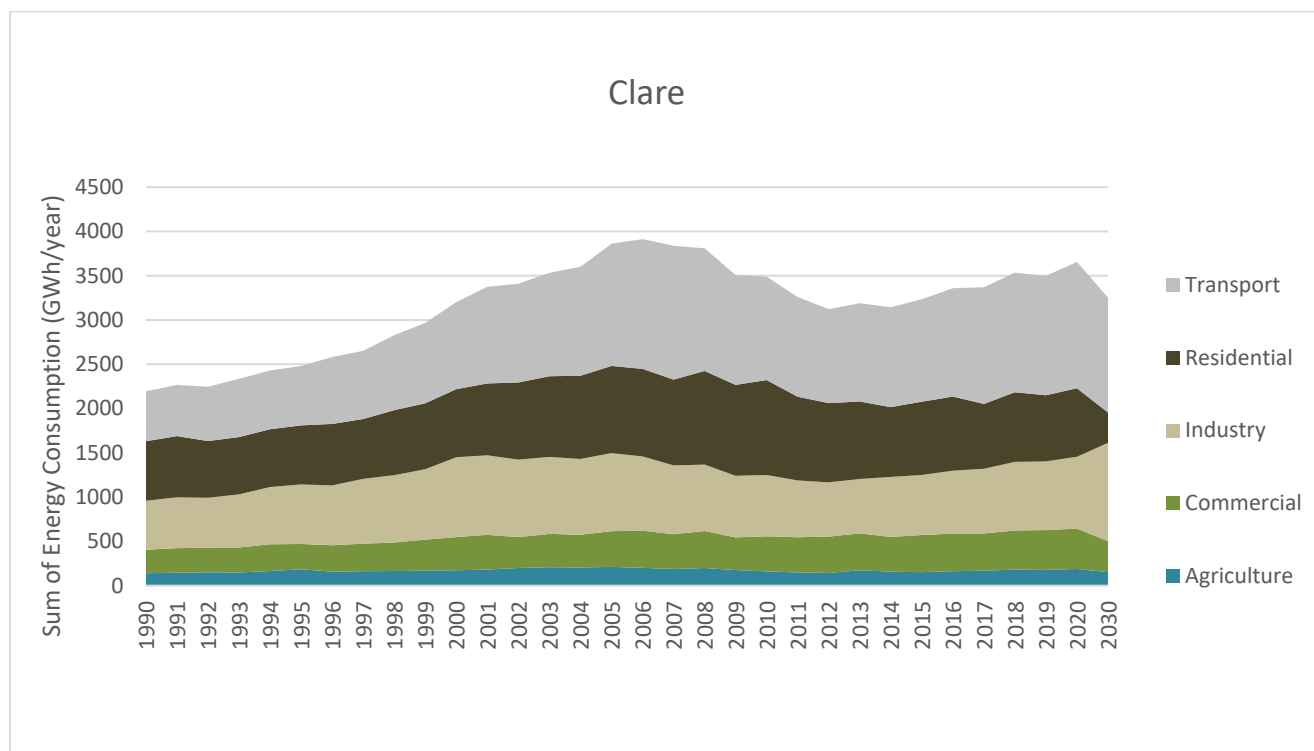
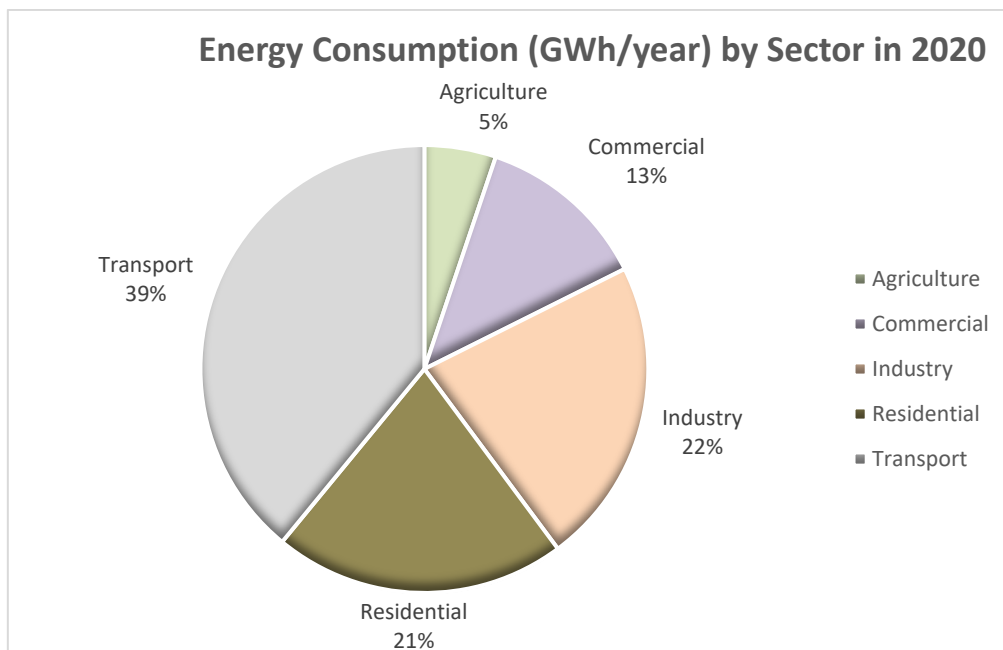


Figure 3.2 outlines in pie-chart form, the energy sector use for the year 2020. The transport and residential sectors constituted 62% of total energy consumption in County Clare during that year.

Figure 3.2 County Clare Total Energy Consumption by Sector - 2020

For County Clare, it is of critical importance that energy efficiency is improved in the use of electricity, heat and transport and that imported energy sources are displaced by renewable energy as far as possible. If energy efficiency is not addressed, a sudden oil shortage, or indeed any imported fossil fuel, would severely impact the County, both economically and socially. This Strategy seeks to guide and facilitate appropriate and sustainable renewable energy development in County Clare to assist in reversing this trend of high fossil fuel dependence and reliance on imports to meet energy needs.

3.3 Meeting the County's Energy Needs from 100% Renewable Sources

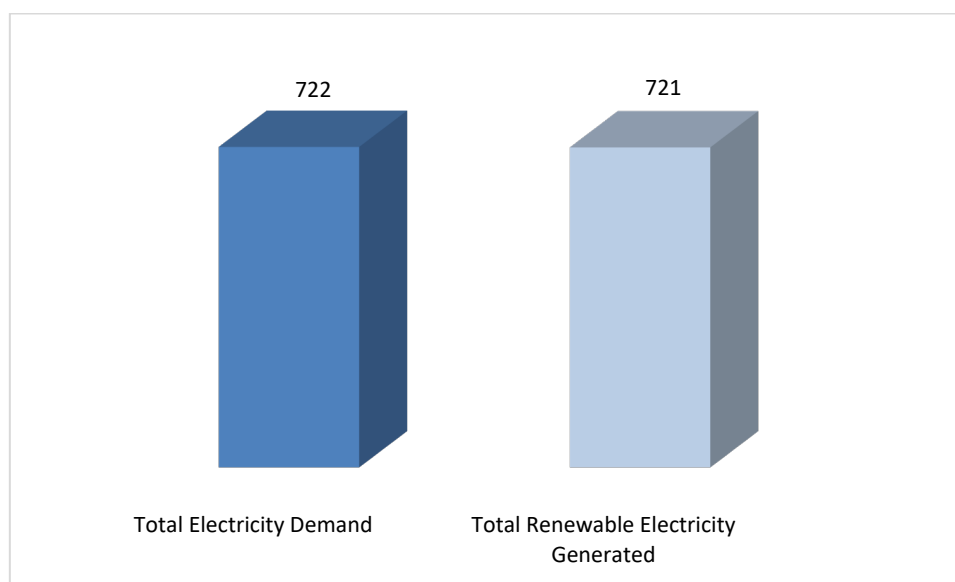
Table 3.3 County Clare- Evolution of Energy use by Fuel Source shows for 2020 a figure of 3,656 GWh/y and a figure of 3,253 GW/Y for 2030 target. This Chapter has outlined County Clare's history of energy production and consumption. However, the County has considerable capacity to produce energy from renewable and indigenous resources. Chapter 4 will address the potential for County Clare to meet all of its energy needs from indigenous renewable energy.

Table 3.3 County Clare - Evolution of Energy Use by Fuel Source¹⁹

(All figures in GWh/y)

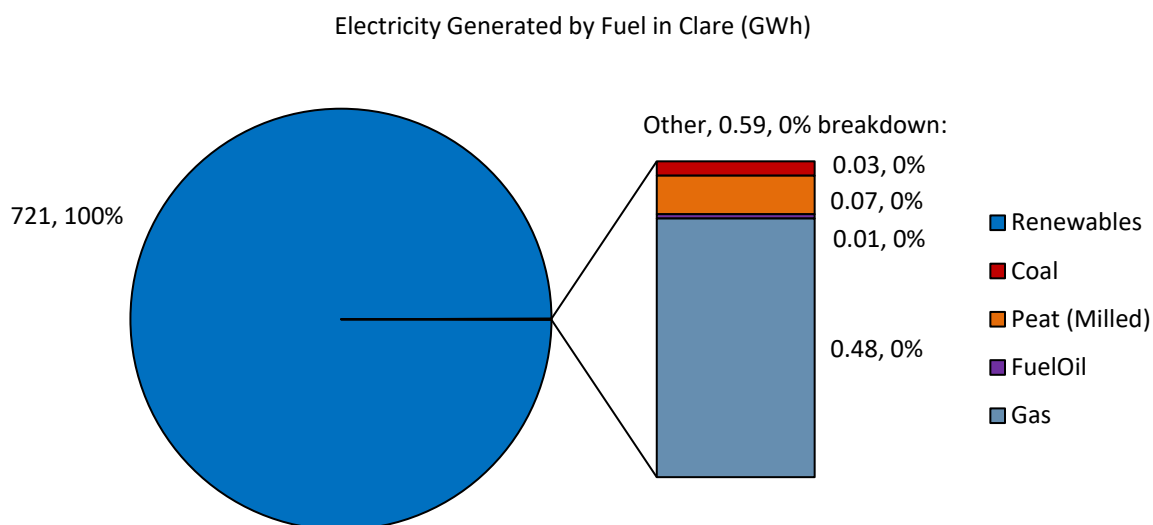
Year	Oil	Electricity	Natural Gas	Coal	Peat	Renewables	Grand Total
2000	1,997	563	382	127	92	41	3,202
2005	2,452	664	439	157	83	67	3,862
2010	2,038	660	500	121	76	94	3,489
2015	1,752	669	534	108	60	111	3,234
2020	2,066	722	613	78	47	130	3,656
2030	1,396	914	496	47	10	391	3,253

Turning to electricity, the Energy Emission Balance found that during 2020, the demand for electricity over the course of the year (722 GWh) happens to almost match the electricity generated from renewable energy generators located in County Clare over the same period (721 GWh), which includes the large hydro-electric generation plant at Ardnacrusha. This is represented in Figure 3.3 below.

Figure 3.3 Renewable Electricity Generation vs Electricity Demand during 2020 (GWh)

In reality, electricity generation and consumption on the grid cannot be allocated on a county-by-county basis, because all energy on the national grid is shared, and also the penetration of renewable – including wind and solar generators – being integrated onto our all-island grid is variable.

¹⁹ Clare Energy and Emissions Balance, Update 2021

Figure 3.4 Source of electricity generation in Clare for 2020 (GWh)

As seen in Figure 3.4, the majority of electricity generation in Clare came from renewable sources in Clare (wind). Less than a 1% share was taken from the national electricity grid. Transport and Heat Renewables are much more difficult to improve relative to electricity. Increasing the generation of renewables within the County will help to reduce national dependence on fossil fuels, so County Clare can still progress further to increase Renewable Energy generation.

3.4 Objectives

RES 3.1 Meeting the County's energy needs from 100% renewables

It is an objective of Clare County Council:

To meet the County's energy needs from 100 % indigenous renewable energy sources.

Chapter 4 Summary of Renewable Potential, Resource and Targets

4.0 Strategic Aims

- To summarise the gross renewable energy potential of County Clare.
- To provide a plan-led and environmentally sustainable approach to renewable energy development, outlining deliverable renewable energy potential within County Clare.

4.1 Introduction

Clare County Council has identified its strategic aims for renewable energy in the Clare County Development Plan 2023 – 2029. The stated aim in these documents is for County Clare to become a 'Low Carbon' County. A low carbon county is one where greenhouse gas emissions are minimised as a result of increased energy use from renewable means and improved energy efficiency. A low carbon county is the precursor to the more advanced zero-carbon situation, whereby carbon emissions are eliminated completely and this necessitates the disuse of all fossil fuels.

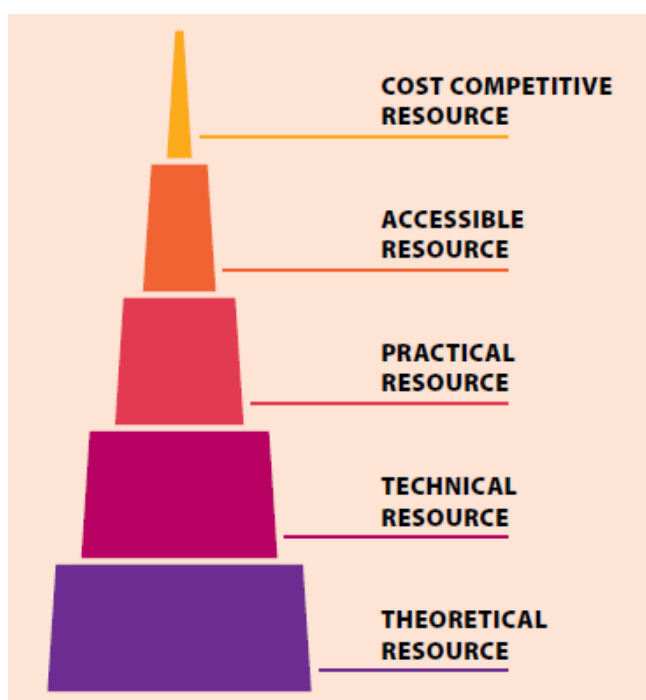
County Clare has substantial renewable energy resources and this Strategy will seek to maximise this potential. The capacity to harness those resources and generate energy will need to be balanced with other considerations, including:

- Community acceptance of energy infrastructure
Key issues include community consultation at an early stage, raising awareness of renewable energy and linking to health, wellbeing and social and economic development.
- Ecological and environmental impact
Impacts on designated sites, flora, fauna, air, water, soil, peat etc. Requirements of Strategic Environmental Assessment, Appropriate Assessment, Water Framework Directive.
- Energy infrastructure capacity / development
Capacity of the grid to accept the levels of electricity capable of being generated by renewable means; requirement for close liaison with EirGrid in regard to Ireland's Grid Development Strategy – Your Grid, Your Tomorrow, project proximity to grid connection.
- Landscape characteristics
Issues surrounding established landscape character and potential impacts thereon, landscape impact, visual impact, mitigation, cumulative issues, e.g. with wind farms.
- Land use change
Linked to landscape also, a growing demand for fuel to serve the renewable energy industry (e.g. woodland and energy crops as biomass) may change agricultural practices and create new demands on rural areas.

- Economic Impact and Job creation
Increased up take of new renewable energy technologies can support job creation and further economic activity.

4.2 Renewable Energy Resource Analysis

In determining the renewable energy potential for County Clare, this Strategy will identify and quantify the renewable energy resource that is available in the County. The analysis of the resource is based on a “sieve analysis”, which starts with the maximum resource possible and concluded with the presently accessible / competitive resource. A graphic analysis of this method is shown below.



Source: Methodology for Local Authority Renewable Energy Strategies, SEAI, 2013

The sieve analysis employed in this strategy is:-

- **Unconstrained** Renewable Energy Potential based on indigenous resources.
- **Technically Practical** Renewable Energy Targets, based on a balanced approach - resources versus other considerations as identified above, e.g. requirements of SEA / AA, community impact etc.
- **Accessible & Planned** Strategic development. This identifies the potential of that resource which is technically possible and balances it with the competing interests of other industries and the statutory consideration for ecological, environmental and heritage.

4.3 Renewable Energy Resource – Unconstrained

The first analysis of the renewable energy resources in the County is “unconstrained” analysis. The term “unconstrained” does not mean un-planned, but rather it is a technical term to describe the gross renewable energy potential that exists, irrespective of our ability to harness, convert, store or deliver the energy created. However, it is a useful starting

point for our analysis of renewable energy resources as it highlights the exceptional geographical and geological value of being located on the west coast of Europe.

Renewable energy development of this scale would be entirely based on capturing the existing resources and would not be representative of the various competing interests of social, community, heritage, ecological or environmental considerations. Renewable energy development on this theoretical and unconstrained scale is not proposed in this Strategy, as it may have a negative impact on the landscape, environmental, ecological, heritage and community aspects of the County.

Table 4.1 below shows that Clare has renewable energy resources capable of meeting its energy needs many times over. Details of the technologies are contained in the chapters listed.

Table 4.1 County Clare Gross Renewable Energy Resource – Unconstrained²⁰

Chapter	Renewable Energy Resource:- County Clare		
	Unconstrained	GWh/y	MW
Thermal			
8	Forest wood fuel & wood Process by-product	256.5	48.8
8	Energy Crop (SRC-Miscanthus)	700.0	159.8
12	Geothermal	306.5	140.0
10	Micro Thermal	962.8	549.1
Sub Total		2,225.8	897.7
AD-CHP*thermal			
8, 14	AD - Grass Silage	181.0	23.0
8, 14	AD - Animal wastes	32.0	4.1
14	Municipal Organic MSW	226.0	28.7
10	Micro CHP	74.7	10.7
8, 12	Biomass CHP	460.5	58.4
Sub Total		974.2	124.8
Electric			
6	Onshore wind	13,766.0	4,761.6
9	Offshore wind	819.0	311.6
7	Solar (Utility Scale)	84,897.0	11,269.0
11	Hydro	467.8	89.0
9	Wave	19,700.0	7,496.2
9	Tidal	367.0	127.0
10	Micro Gen elec	48.6	14.9
8, 10	CHP electric	584.5	35.0
Sub Total		44,242.6	24,104.3
13	Transport	1,404.0	200.3
Overall Resource		48,846.6	25,327.2

²⁰ Renewable Energy Resource Assessment of Clare and Limerick, 2010, LCEA

Table 4.1 above presents the gross theoretical renewable energy potential of County Clare (unconstrained). It shows that County Clare has the potential to provide many times its actual energy needs from renewable resources. However, this level of renewable energy development would be unlikely to be achieved on adoption of a balanced, sustainable planned approach.

4.4 Renewable Energy Resource – Technical & Practical

It will not be possible to harness the unconstrained potential of renewable energy for a number of important reasons:-

- The present economic activity from land resources
- The present economic activity from sea / marine resources
- Technological readiness for some resources (such as marine energy) is well advanced but commercial machines are not yet being deployed
- Infrastructure to facilitate the transmission, distribution and storage of energy will be required for the optimal development of some electric and thermal systems (e.g. Combined Heat and Power – CHP).

Therefore, the unconstrained quantity of renewable energy identified in Table 4.1 has been moderated to reflect the issues raised. The revised technical and practical renewable energy resource is presented in Table 4.2. Details of the technologies are contained in the chapters listed.

Table 4.2 Renewable Energy Resource Targets (Technical & Practical)

Chapter	Renewable Resource	County Clare	
	Technical & Practical	GWh/y	MW
Thermal			
8	Forest wood fuel & Wood Process by-product	128.3	29.3
8	Energy Crop (SRC-Miscanthus)	175.0	39.9
12	Geothermal	134.9	61.6
10	Micro Thermal	529.5	302.0
Sub Total		967.6	432.8
AD-CHP*thermal			
8, 14	AD - Grass Silage	60.3	7.6
8, 14	AD - Animal wastes	16.0	2.0
14	Municipal Organic MSW	75.3	9.5
10	Micro CHP	3.7	0.5
8, 12	Biomass CHP	460.0	58.3
Sub Total		615.3	78.1
Electric			
6	Onshore wind	2,753.2	952.4
9	Offshore wind	272.7	103.8
7	Solar (Utility Scale)	83,887.0	11,135.0
11	Hydro	468.0	89.0
9	Wave	197.0	75.0
9	Tidal	110.1	41.9
10	Micro Gen elec	16.1	4.8
8, 10	CHP electric	307.6	29.2
Sub Total		12,513.5	12,431.1
13	Transport	204.0	29.1
Overall Resource Target		14,300.5	12,970.9

4.5 Renewable Energy Resource – Accessible & Planned

The Technical / Practical Renewable Energy Resource identified in Table 4.2 may be delivered. However, there are a number of issues that would limit the full delivery of those resources that are technically and practically possible. The issues to be addressed would include:-

- Proximity to or within a designated area such as NHA, SPA, SAC;
- Proximity to suitable energy infrastructure or consumer(s);
- Proximity to suitable transport infrastructure;
- Economic harvesting & life cycle of bio-energy resources;
- Competing economic / social interests; and
- National / Regional and Local Planning Policy on energy

A more balanced approach would be to examine the targeted renewable energy potential based on available resources, taken together with all other considerations, including environmental requirements, availability of grid connections, impact on community etc. This is presented in Table 4.3 below.

Table 4.3 shows that County Clare has the capacity to meet almost 100% of its energy needs from renewable energy resources in the County by 2030. However, this target can only be met if:

- Biomass energy crops are planted in significant areas throughout County Clare; Waste streams, especially organic waste, are utilised for energy generation; The County Clare Wind Energy Strategy targets are realised; Solar energy development is progressed and supported in the period up to 2030; and Marine energy development is progressed and supported in the period up to 2030
- Energy storage and conversion technologies are implemented.

This renewable energy strategy will be in place until 2030, allowing for a significant period in which to facilitate and support renewable energy projects and acknowledging the long lead in time for many schemes (testing / planning / construction / commissioning etc.). The targets set out go beyond 2030 – a key date for Ireland to meet assigned national and European targets for renewable energy generation. The targets established in this RES should not be interpreted as a ceiling and in the event that significant progress is being made towards the overall goal of a low carbon economy through renewable energy generation, any further projects should not be delayed or influenced by the fact they may result in any of the established targets being exceeded.

The following table reflects the issues identified above and moderates the technical & practical renewable energy resource to determine the Accessible Renewable Energy Resource. In relation to on-shore wind energy the existing Clare WES is being carried over to the Clare County Development Plan 2023-2029 pending government Wind Energy Guidelines being finalised. Therefore it is not intended to review the target for on-shore wind prior to the issuing of new guidance and the subsequent preparation of a new WES.

Table 4.3 Renewable Energy Resource Targets (Accessible - Planned)

Chapter	Renewable Energy Resource	County Clare	
	Accessible - Planned	GWh/y	MW
Thermal			
8	Forest wood fuel & Wood Process by-product	64.2	14.7
8	Energy Crop (SRC-Miscanthus)	87.5	20.0
12	Geothermal	34.0	15.0
10	Micro-Thermal	175.7	92.8
Sub Total		361.4	142.4
AD-CHP*thermal			
8, 14	AD - Grass Silage	20.1	2.5
8, 14	AD - Animal wastes	15.8	2.0
14	Municipal Organic MSW	25.1	3.2
10	Micro CHP	2.0	0.5
8, 12	Biomass CHP	230.0	29.2
Sub Total		293.0	37.4
Electric			
6	Onshore wind	1,590.0	550.0
9	Offshore wind		
7	Solar	226.0	300
11	Hydro	468.0	89.0
9	Wave	59.1	20.4
9	Tidal	66.1	20.0
10	Micro Gen - elec	7.2	2.1
8, 10	CHP electric	261.5	29.2
Sub Total		2,677.9	1010.7
13	Transport	204.0	29.1
Overall Total Renewable Target		3536.3	1,219.6
(Of which Community and Citizen owned elements)		459.1	110.3

In relation to off-shore wind it is currently unclear whether or how these would be considered in the context of a local authority renewable energy strategy or its targets. Also, it is likely any off-shore construction activity will be post 2030. Taking this into account, there should be no target set for off-shore wind but instead the focus should be on the development of the on-land service infrastructure in preparation for when the time comes for the delivery of off-shore installations. Details of offshore wind and Marine Renewable are in Chapter 9 of this RES.

4.6 Identification of existing Renewable Energy projects - Installed Capacity

Map 4.1 shows the location and installed capacity (Mw/h) of renewable energy projects in Clare which include energy from wind, solar, hydro, wave and tidal. It does not show projects which were refused permission or projects which are deemed to be exempted development having regard to the Planning and Development Regulations 2001, as

amended. Table 4.4 presents the resource by energy type of installed capacity in Co. Clare in 2020.

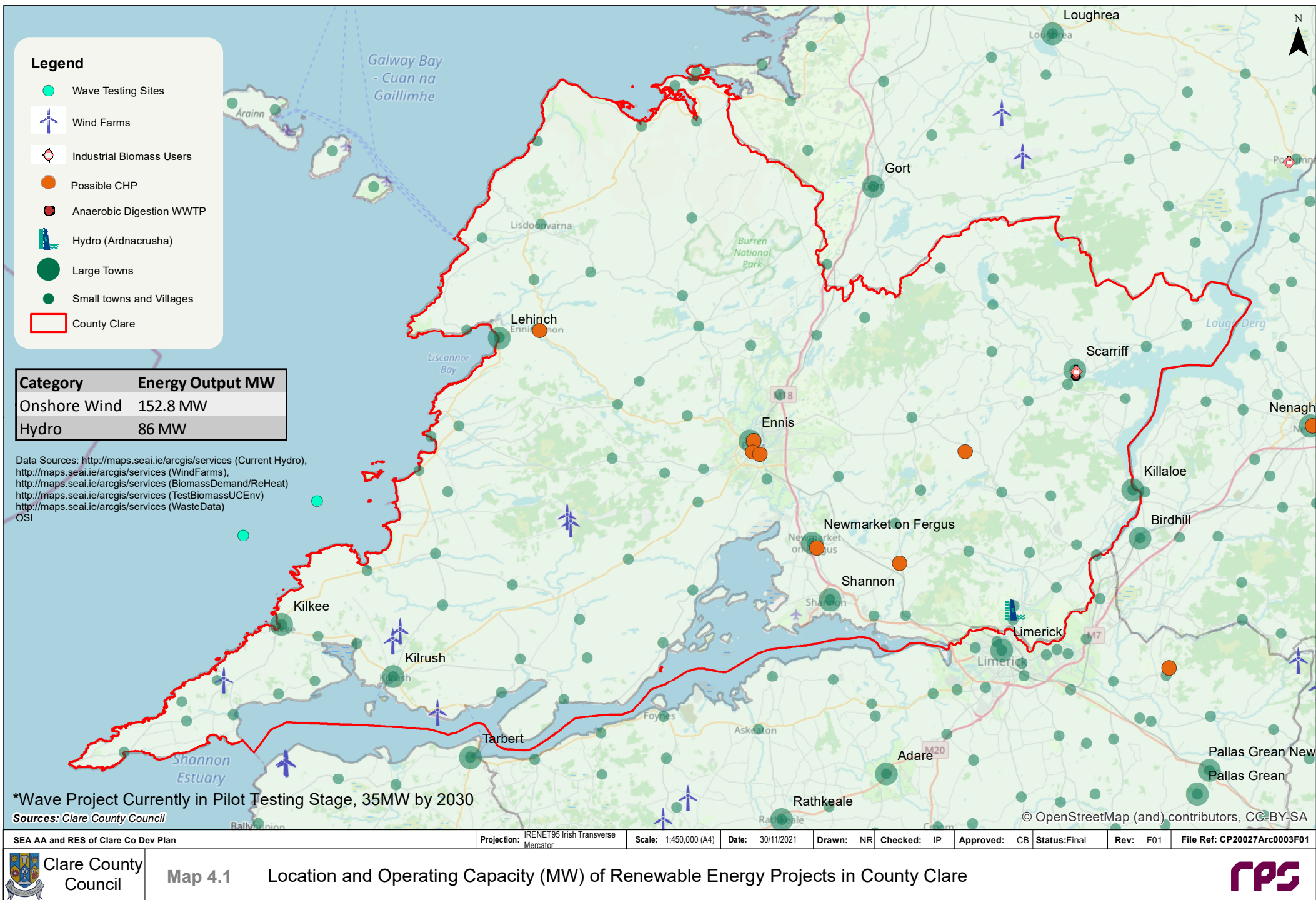


Table 4.4 Energy generating facilities in Clare in 2020

Renewable Energy Type	Name	Resource	Installed Capacity (MW)
Wind	Total	Wind	152.8
Hydro	Ardnacrusha	Water	86
Tidal*	Total	Water	0
Wave*	Total	Water	0

4.7 Identification of potential RE projects – Permitted Capacity

Map 4.2 shows the location and capacity of renewable energy projects permitted but not constructed/not operational and proposed renewable energy development in Co. Clare which include energy from wind, solar, wave, tidal, biomass and energy storage. This map also shows permissions pending. It does not show the spatial distribution of projects which were refused planning permission. Table 4.5 shows the total permitted capacity (MW) by renewable energy type.

Table 4.5 Permitted Capacity in Clare

Renewable Energy Type	Permitted Capacity (MW)
On shore wind	347.17
Solar	110
Hydro	86
Wave	
Tidal	
Biomass	
Energy Conversion Systems/Storage	60

4.8 Objectives

RES 4.1 Meeting the County's energy needs from 100% renewables

It is an objective of Clare County Council:

To facilitate the achievement of (or to exceed where possible) the renewable energy targets set out in Table 4.3 by 2030, ensuring that County Clare is the national leader in sustainable renewable energy generation, supporting energy efficiency, security and conservation, achieving balanced social, environmental and economic development throughout the County and assisting in the achievement of Ireland's national climate change mitigation targets.

Chapter 5 Energy Conservation and Efficiency

5.0 Strategic Aims

The strategic aims of this chapter are to:

- Define what is meant by energy conservation and energy efficiency.
- Set out legislative and policy context for energy efficiency and conservation.
- Set out policy in support of energy efficiency and conservation.
- Set out objectives for energy efficiency and conservation.

5.1 Introduction

Energy efficiency involves using less energy to perform the same task. Although less energy is consumed, the same standard of product or service is achieved, thus it is the energy waste that is reduced. Ireland has a target of 32.5% improvement in energy efficiency and energy savings through efficiency by 2030, and a more ambitious target of 33% in the public sector alone.²¹ ²² Under the Climate Action Plan 2023, the public sector target has increased to 50% improvement in energy efficiency.

Energy efficiency is typically improved through technology advancements and design improvements. It is then the responsibility of residents, businesses, and industries to invest in these technologies, which typically result in financial savings following an initial investment.

The SEAI have identified measures that have the potential to provide energy efficiency savings of almost 25% of Ireland's 2013 demand. Of these measures, both technical and behavioural, 75% will bring net financial savings in the long term.²³ The remaining measures can be implemented with appropriate support and financial incentives. The sector with the greatest potential for energy efficiency savings is the residential buildings sector, followed by transport, commercial buildings, and industry.

The main opportunities in buildings are LED lighting, roof and solid wall insulation, efficient glazing, efficient appliances, and heating systems such as heat pumps or efficient boilers with heating controls. Industry can benefit in the long term from investing in the installation of Combined Heat and Power (CHP). Energy efficiency in the transport sector is driven by EU regulations and modal shifts.²³

Energy conservation is behaviour that results in the use of less energy. Conservation is usually reliant on changes in human behaviour and increased awareness or smart monitoring and control technology. There are measures that can be taken to conserve energy whilst maintaining a satisfactory standard of living. For example, installing timers or smart heating controls, turning the temperature down by 1°C, switching off lights, appliances, and devices when not in use and maximising natural daylight. Once implemented, these measures can provide financial savings on the next energy bill, while also contributing to Clare and Ireland's targets. Although retrofit and energy efficient installations are vital if targets are to be achieved, it has been reported that to date, most of the savings have come from lower cost energy conservation measures.²²

²¹ Ireland's Energy Targets, SEAI (2021) | <https://www.seai.ie/about/irelands-energy-targets/> [Accessed: 30/03/2021]

²² DCCAE National Energy Efficiency Action Plan for Ireland #4 2017-2020 [Accessed: 30/03/2021]

²³ Unlocking the Energy Efficiency Opportunity, SEAI (2015) | <https://www.seai.ie/resources/publications/Unlocking-the-Energy-Efficiency-Opportunity-Summary-for-Policymakers.pdf> [Accessed 30/03/2021]

5.2 Policy Context

This section outlines the relevant policy, plans and programmes in relation to energy efficiency in Ireland.

5.2.1 European

Directive 2012/27/EU established a set of binding measures to help the EU reach its 20% energy efficiency target by 2020. In 2018, as part of the '**Clean energy for all Europeans package**', the new amending Directive on **Energy Efficiency (2018/2002)** was agreed to update the policy framework to 2030 and beyond.

The key element of the amended directive is an energy efficiency target for 2030 of at least 32.5%. The target, to be achieved collectively across the EU, is set relative to the 2007 modelling projections for 2030. This means that EU energy consumption should be no more than 1273 Mtoe (million tonnes of equivalent) of primary energy and/or no more than 956 Mtoe of final energy.

To further step up efforts, in July 2021, the European Commission put forward a proposal to recast the directive on energy efficiency once again. The recast proposal, which has been accepted by Member States, raises the level of ambition of the EU energy efficiency target and makes it binding by requiring EU countries to collectively ensure an additional reduction of energy consumption of 9% compared to the 2020 reference scenario projection.

The **European Energy Performance of Building Directive Recast 2010** (EPBD) requires all new buildings to be nearly Zero Energy Buildings (nZEB) by the 31st December 2020 and all building acquired by public bodies by 31st December 2018. Any buildings completed after these dates should achieve the standard irrespective of when they were started. The European Commission published guidance on the nZEB standard, specifically for Oceanic zone, which applies to Ireland. The guidance issues the following recommendations:

- Offices: 40-55 kWh/(m².y) of net primary energy with, typically, 85-100 kWh/(m².y) of primary energy use covered by 45 kWh/(m².y) of on-site renewable sources;
- New single family house: 15-30 kWh/(m².y) of net primary energy with, typically, 50-65 kWh/(m².y) of primary energy use covered by 35 kWh/(m².y) of on-site renewable sources.

To comply with the requirements of the European Energy Performance of Building Directive Recast 2010 (EPBD), the Government has revised the **Building Regulations Part L – Conservation of Fuel and Energy – Buildings other than Dwellings** (2017) and the accompanying **Technical Guidance** (non-residential buildings) and **Technical Guidance Document L – Conservation of Fuel and Energy – Dwelling** (2017)(residential).

5.2.2 National

The Department of Communications, Climate Action and Environment (renamed the Department of the Environment, Climate and Communications) have published a **National Energy Efficiency Action Plan (NEEAP) #4 2017-2020**. This plan sets out Ireland's progress to achieving our energy efficiency targets and details the measures that could be implemented to maximise savings. Achieving the 20% target would equate to 31,925 GWh of primary energy saved. The plan explores the residential, commercial, transport and public sector, detailing the strategies and policies in place to improve energy efficiency.

Ireland has put in place an Energy Efficiency Obligation Scheme (EEOS) to deliver on these savings.

Table 5.1 below shows the energy savings targets for Ireland from 2017 to 2020. It shows that the greatest energy savings required are in the business, residential and transport sectors.

Table 5.1 Ireland's Energy Reductions – NEEAP

National Energy Efficiency Action Plan 4	Savings toward targets			
	GWh - PEE	%	GWh - PEE	%
2016-2020				
Sector	2016 achieved		2020 anticipated	
Commercial	3744	20	4384	17
Public	2195	12	2795	11
Residential	5578	30	7482	29
Transport	1331	7	1501	6
Energy Supply	3279	18	5279	20
Cross Sectoral measures	2527	14	4462	17
Total of Measures	18,654	100	25,904	
Energy Savings Directive Target	13,117		31,925	
Additional Measures	-		8,185	

A **Public Sector Energy Efficiency Strategy** was published in 2017 detailing how the target of 33% energy efficiency savings could be met by 2020. Achieving this target would see the public sector save €246 million on energy spend and avoid 5.9 million tonnes of CO₂ emissions between 2009 and 2020. The strategy highlights that most of the savings to date have been from behavioural changes, smarter energy use and some equipment upgrades. For the target to be met, progress must be made on a larger scale, such as the deep retrofit and renovation of buildings. The aim of the strategy is to promote greater effort in energy efficiency and energy management in the public sector, providing an example for other sectors to follow suit. Under The Climate Action Plan 2023, the public sector target has further increased to a 50% improvement in energy efficiency by 2030.

Ireland's NECP 2021-2030 sets out a range of policies and measures that will contribute towards achievements of the energy efficiency. These policies and measures will contribute towards the EU wide target of achieving at least 32.5 % improvement in energy efficiency by 2030.

- All new dwellings will be built to NZEB standard from 1 November 2019.
- Setting stricter requirements for new buildings and substantial refurbishments.
- Building a supply chain and a model for aggregation where home retrofits are grouped together.
- 500,000 homes retrofitted to a B2 Building Energy Rating or cost optimal equivalent by 2030.
- Public sector buildings to have a B Building Energy Rating (BER) by 2030.

- One third of commercial (including mixed use) buildings to have a B BER (or carbon equivalent gains) by 2030.
- 600,000 heat pumps installed over the period 2021-2030.
- Effectively ban the installation of oil boilers from 2022 and the installation of gas boilers from 2025 in all new dwellings through the introduction of new regulatory standards for home heating systems. Progressively phase out oil and gas boilers in existing dwellings through a combination of incentives, information and regulatory measures.
- Ensure a suitable policy framework is in place to support district heating.
- A 50% energy efficiency target for the Public Sector by 2030.
- The Targeted Agricultural Modernisation Scheme (TAMS) II Scheme provides grant aid for a number of investments specifically aimed at improving energy efficiency in the farming sector.
- Scale-up and improve the Sustainable Energy Communities and Better Energy Communities (BEC) programme and enlist a wider range of organisations to anchor its collective approach.
- Develop the necessary supply chain, including working with Regional Skills Fora to train skilled workers

The energy efficiency trajectories based on the 'With additional measures' (WAM) scenario are outlined in Table 5.2. The information contained with Table 11 of the NECP 2021-2030 has been adapted to determine the average annual energy savings for this period.

Table 5.2 Average energy efficiency trajectory to 2030²⁴

Energy efficiency Policies	Average 2021-2030 (GWh)
Primary Energy Savings	3,895
Final Energy Savings	3,536
Supply-side energy savings	1,331
Total primary energy consumption	-1,071
Total final energy consumption	-1,143

5.2.3 County Clare

The County Clare Energy and Emissions Balance (2021) has estimated the County's own energy needs and the associated CO₂ emissions. This report shows that 21% of all energy

²⁴ Adapted from Table 11, NECP 2021-2030, DOECC (2021)| https://ec.europa.eu/energy/sites/ener/files/documents/ie_final_necp_main_en.pdf [Accessed 07/06/2021]

is consumed in the residential and transport (39%) sectors. The report also shows that in 2018 the County is over 65% dependant on imported energy.

The economic and social sustainability of the County is highly dependent upon external forces governing the supply and cost of our energy needs. In order to provide future generations with a secure, clean, energy resource, it is essential that we:-

- (i.) increase our energy efficiency
- (ii.) use indigenous, low carbon energy resources to meet the reduced quantity required.
- (iii.) Encourage and support Renewable Energy Communities that provides local employment, revenue and energy security.

Table 5.3 summarises the energy savings required in County Clare as part of the county's burden sharing of the national targets under the NEEAP.

Table 5.3 County Clare energy reductions in relation to the NEEAP

NEEAP	County Clare - GWh		
	2010	2016	2020
Public Sector	15.8	50.4	84.7
Business	70.9	121.0	164.0
Buildings	66.6	249.8	400.9
Mobility-Transport	16.9	90.0	145.9
Sub Total Energy Consumers	170.2	511.2	795.5
Energy Supply	50.6	52.0	114.8
Grand Totals	220.8	563.2	910.2

The table illustrates the importance of energy savings in buildings and particularly in the residential sector.

In line with RPO 56 of the RSES for the Shannon Region, local authorities shall report annually on energy usage in all public buildings and will achieve a target of 50% improvement in energy efficiency in all buildings in accordance with the National Energy Efficiency Action Plan (NEEAP). Clare County Council's Energy Action Plan identifies a number of energy efficiency upgrades to achieve this target. In 2021, Clare County Council will have improved energy efficiency by 13.8% per annum on the baseline year in 2009. Table 5.4 summarises the most recent programme undertaken to achieve this target.

Table 5.4 Clare County Council Energy Action Plan 2020/2021

Electricity	Actions	Savings kWh
Public Lights	14,586 lamps upgraded to LED	3,212,520
Cliffs of Moher	Ventilation and heat pumps	10,000
Corporate	Upgrade lighting in corporate offices	TBC
Leisure Centre	Pumps, fans, and lighting upgrades	TBC
	Electricity Project Subtotals	3,222,520
Thermal		
Aras Contae an Chlair	BMS control upgrades	147,639
Leisure Centre	BMS control upgrades	196,851
Aras Contae an Chlair	Natural ventilation & thermostat	147,639
	Thermal Project Subtotals	492,128
Transport		
L.A. Fleet	Improve engines to EU5 / EU6	220,697
L.A. Drivers	Driver telemetric	110,0,348
L.A. Fleet	Electric and CNG for small vehicles	137,935
L.A. Fleet	L.A. EV infrastructure at 10 points	82,761
	Transport Project Subtotals	551,741
Total Final Energy Savings		4,266,390

5.2.4 SEAI Programmes

SEAI estimate that a sum of €35 billion will be required over 35 years to make the existing housing stock low carbon by 2040. The SEAI have grants and programmes in place to support energy efficiency in homes, communities, and businesses.

The **Better Energy Homes Programme** is designed to assist homeowners in reducing their energy consumption and achieving energy cost savings through financial incentives. Grants are available for measures including attic and wall insulation, upgrading heating controls, solar thermal, heat pump systems and Building Energy Rating (BER). For those in receipt of welfare payments, the SEAI offer a range of free energy efficiency upgrades for eligible homes. Rather than providing a cash grant, measures such as attic and wall insulation, draught proofing, lagging jackets and energy efficient lighting are provided free of charge. The scheme has invested more than €175 million since its introduction, upgrading over 140,000 dwellings. The scheme has supported over 402,871 individual energy efficiency measures by providing more than €200 million worth of grants for homeowners in Ireland. From the launch of the scheme in 2009, the total homes completed in County Clare is **13,256 (24%)**.²⁵

The SEAI also offered a pilot programme with a Deep Retrofit Grant for older homes with a poor energy rating. These retrofit projects involved multiple energy efficiency upgrades amounting to over €30,000. The programme is now closed but the findings of the programme are to inform the SEAI approach towards a large scale deep retrofit of Ireland's housing stock.

²⁵ Home Energy Grants, SEAI (2021) | <https://www.seai.ie/grants/home-energy-grants/home-upgrades/home-energy-upgrades-by-county.pdf> [Accessed: 30/03/2021]

The SEAI **Better Energy Communities Programme** provides grant support for communities looking to achieve energy efficiency and reduce energy use by using a cross-sectoral approach throughout the community. The programme aims to combine buildings into one retrofit programme, making the process more efficient and cost effective. The project can involve residential housing, private and public sector non-residential buildings and commercial, voluntary and community organisations. In 2020, the total grant funding offered was €18.7 million with a total of 25 projects. The combined energy credits saved amount to 181 Gwh. There is a limit of €1 million funding for each project, with a yearly budget of €28 million in total for 2021.²⁶ The scheme has made significant investment in communities, upgrading more than 15,000 homes and hundreds of community, private and public buildings, along with creating over 700 direct and indirect jobs around the country.²² Communities participating in this programme are encouraged to become a Sustainable Energy Community (SEC), a network supported by the SEAI that is focused on reducing energy consumption, improving energy efficiency and generating cleaner energy. There are twenty-two SECs in Clare. (see Chapter 18 for Community Energy)

Business Grants are also available from the SEAI, including Project **Assistance Grants** and the **EXEED Certified Grant**, which provide funding for businesses to implement measures to reduce energy use and improve efficiency.²⁷ The **Accelerated Capital Allowance** is a tax incentive encouraging energy saving technology. The **Project Assistance Grant** explores opportunities for reduction in energy use for companies that spend over €250,000 on energy bills.

5.3 Objectives

RES 5.1 Energy Efficiency and Conservation

It is an objective of Clare County Council:

- A. To contribute towards the EU wide target of achieving at least 32.5 % improvement in energy efficiency.
- B. To achieve the 50% energy efficiency target for public sector bodies by 2030.
- C. To support the implementation of national energy efficiency standards and to support and facilitate energy conservation and efficiency, including through:
 - Improved building design;
 - Promoting smarter travel; and
 - Raising awareness / benefits of energy conservation
- D. Encourage consideration of energy efficiency and low-carbon design solutions when carrying out pre-planning

²⁶ Community grants, SEAI (2021) | <https://www.seai.ie/grants/community-grants/> [Accessed: 30/03/2021]

²⁷ Business grants, SEAI (2021) | <https://www.seai.ie/grants/business-grants/> [Accessed: 30/03/2021]

RES 5.1 Energy Efficiency and Conservation

discussions for major residential, commercial, and industrial development.

- E. To require all planning applications for new buildings to demonstrate how they have incorporated measures for sustainable energy efficiency, in respect of siting, design, building fabric and services , (i.e. heating and ventilation), as a means of reducing future reliance on traditional fuel sources.
- F. To encourage a high standard of sustainable energy efficiency and conservation in the existing building stock by encouraging developers, owners, and occupiers to improve the environmental performance of buildings and to promote the uptake in incentives, schemes, grants or other available funding to improve energy efficiency.
- G. To reduce the County's dependence on imported fossil fuels and to develop a low carbon economy by:
 - a. Promoting innovative new building design which demonstrates a high level of energy conservation, energy efficiency and use of renewable energy sources.
 - b. Promoting retrofitting of existing buildings to achieve a high level of energy conservation, energy efficiency and use of renewable energy sources
 - c. Promoting the development and use of alternative energy vehicles in line with the concept of smarter travel and encourage and facilitate the development of ancillary infrastructure.
 - d. Increasing awareness of the environmental, financial, social and practical benefits of being energy efficient.
 - e. Supporting and facilitating the development of sustainable energy communities.
 - f. Promoting the further development of sustainable energy practices in industry and commerce, including the use of clean technologies.
 - g. Promoting and facilitating research and development in energy efficiency and conservation best practice.
 - h. Identifying significant 'waste' energy sources in County Clare and to promote and facilitate the

RES 5.1 Energy Efficiency and Conservation

capture and conversion of such energy to a usable resource for local consumption.

- i. Promoting the use of efficient energy storage systems and infrastructure that supports energy efficiency and renewable energy system optimisation
- j. Supporting energy efficiency and conservation education in partnership with local, regional, and national organisations.

Chapter 6 Onshore Wind

6.1 Introduction

This chapter deals with onshore wind and provides a summary of the key objectives of the Clare County Wind Energy Strategy (WES), in the interests of completeness. The WES forms Volume 6 of the Clare County Development Plan 2023- 2029.

Onshore wind energy is the largest contributor to total renewable energy generation in Co. Clare, which reflects the national status of wind energy contribution. There is currently an installed capacity of c. 153 MW of onshore wind power in the county.^{28 29 30} A total of nineteen onshore wind energy projects, two of which are located in Clare, have been approved under the RESS 1 Auction. Table 6.1 details the successful onshore wind projects under the RESS 1 auction in Clare.

Table 6.1 Successful onshore wind projects in RESS 1

Successful Project	ITM (Easting, Northing)	Offer Quantity (MW)
Crossmore Windfarm	513585 , 660239	15
Clare Winds Limited	518248 , 669681	8
Total		23

In order to meet the required level of emissions reduction by 2030, the Climate Action Plan 2023 requires an increase in electricity generated from renewable resources to 80% of all generation, and outlines an ambitious target of 9GW of on-shore wind generation in Ireland.

As the WES has been adopted, any changes to it are outside the scope of this Strategy, however, the SEA and AA processes that have informed the preparation of this Renewable Energy Strategy have taken account of the adopted WES and potential cumulative effects.

6.2 Technology

Wind energy converts kinetic energy of moving air into electricity or mechanical power. With good wind resource, it can be the lowest cost provider of electricity. Turbines generate electrical energy, hence, Wind Energy Systems (WES) can provide power to central grids or to isolated/decentralised grids, or to serve as a remote power supply or for a wide range of applications.

6.3 The Strategy

The WES facilitates the development of onshore wind farms by maximising the wind resources of the County having regard to technological advances in turbine design, information on wind speeds, proximity and availability to grid connection and to changing

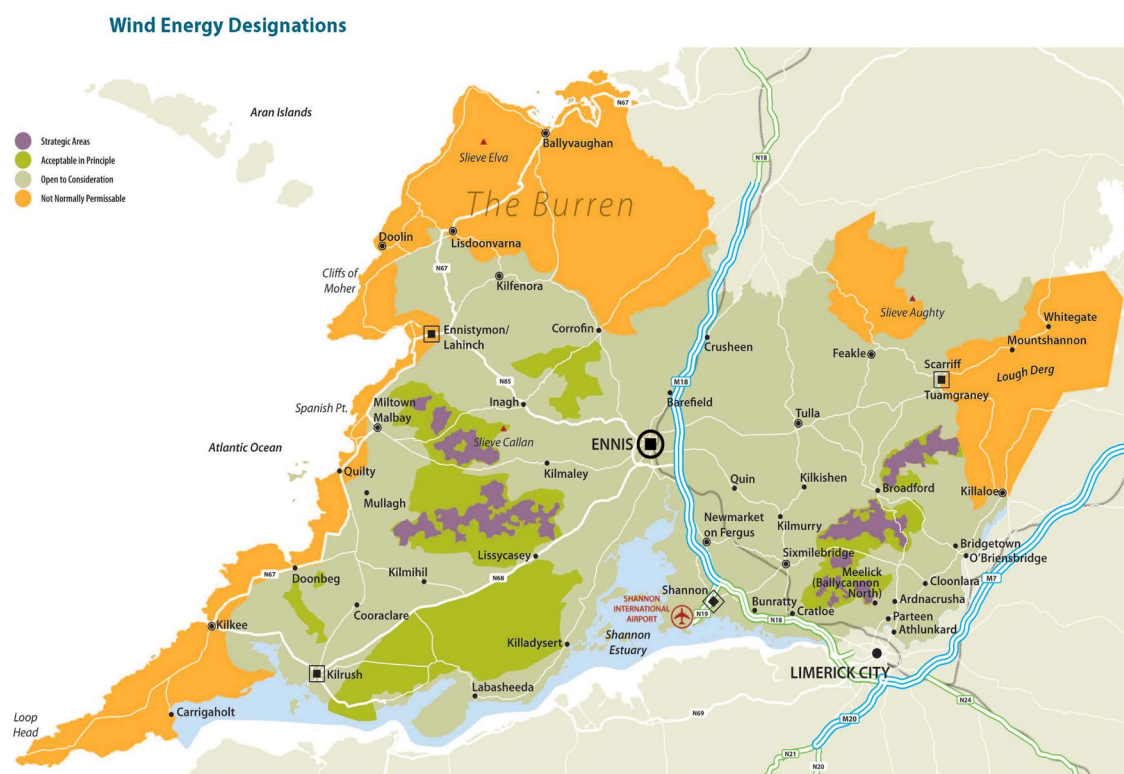
²⁸ ESB Wind Generators, ESB (2021) | https://www.esbnetworks.ie/docs/default-source/publications/dso-connected-energised-wind-generators-q4-2018.pdf?sfvrsn=e18b05f0_0 [Accessed: 12/04/2021]

²⁹ Connected Renewable Generation, Eirgrid (2021) | <http://www.eirgridgroup.com/site-files/library/EirGrid/TSO-Connected-Renewable-Generation.pdf> [Accessed 07/06/2021]

³⁰ The Wind Power List, The Wind Power (2021) | https://www.thewindpower.net/windfarms_list_en.php [Accessed: 12/03/2021]

energy and grid connection regulations while minimising any environmental and visual impacts.

Figure 6.1 Wind Energy Designations



The WES identifies sites of strategic regional and national importance that have the potential to accommodate wind energy development. It designates areas as being either a) strategic, b) acceptable in principle, c) open for consideration or d) not normally permissible, for wind energy development, as shown on **Figure 6.1**.

The objective for the **Strategic Areas** (WES8) states that these areas are eminently suitable for wind farm development and notes their good/excellent wind resource, access to grid, distance from properties and location outside designated sites. A target of **400MW** from these areas is identified. WES8 outlines key issues as being compliance with the Department of Environment. Wind Energy Guidelines, comprehensive development of the strategic areas, environmental protection and avoidance of visual clutter.

The objective for the **Acceptable in Principle** areas (WES9) states that these areas are considered suitable for wind farm development and notes their sufficient wind speeds, access to grid and established patterns of inquiries. A target of **150MW** from these areas is identified. WES9 outlines key issues as being compliance with the D. o E. Wind Energy Guidelines, environmental protection and avoidance of visual clutter.

The **Areas Open to Consideration** will be assessed on a case by case basis, subject to viable wind speeds, environmental resources and constraints and cumulative impacts.

The **Not Normally Permissible** areas are not considered suitable for wind farm development as a result of their overall sensitivity arising from landscape, ecological, recreational and/or cultural and built heritage resources. The SEA and AA processes assisted in the identification of these areas.

Any planning applications for wind energy development within the County shall ensure that development proposals in the vicinity of or potentially affecting in any way an NHA or pNHA provide sufficient information showing how it potentially would impact on the designated site (through an assessment of effects on their Features of Interest) and how any such potential impact will be appropriately mitigated. Any planning applications for wind energy development within the County shall ensure that all NHA's and pNHA's are afforded the appropriate level of protection by only permitting development demonstrated not to have a significant adverse effect on the conservation value of such areas. Any proposed wind energy development that could have significant effects on an NHA is likely to require an EIA and the preparation of an EIAR.

It should be noted that nature designations including SAC's, SPA's, NHA's and pNHA's undergo constant change, both with regard to geographic extent and legal status due to appeal procedures and ongoing processes of designation. Changes to the designations may occur over the lifetime of the RES, which may not be reflected on the maps. Applicants/ landowners are advised to consult with the NPWS to obtain the most up to date information. In the assessment of any planning application for wind energy or other renewable energy development Clare County Council will have regard to the most up to date nature designation boundaries and the consequent requirements and obligations under the Habitat Directive, Birds Directive and associated Regulations.

6.5 Repower Potential

In addition to potential for new wind farms, repowering is also a concept which will become more relevant as the national wind turbine fleet matures. Most wind turbines have an operational life of 20-25 years. Rather than decommissioning a wind farm in its entirety, repowering offers an opportunity to replace some or all turbines thereby extending the operating life of the wind farm. Repowering can result in a smaller number of higher-output turbines as the technology continues to advance. This potentially contributes to less environmental and economic impact, as improvements are made to an existing installation and are cheaper than new-builds. Repowering is also a key strategy in the SEAI's Wind Energy Roadmap 2011-2050 for driving onshore wind capacity growth from 2030 onwards.³¹

To date, not much analysis has been undertaken to determine what volume of repowering potential is possible for Ireland. The 2019 IWEA repower report has outlined the potential for Co. Clare; see Table 6.2 The age of an existing wind farm indicates the degree to which aged wind farms will potentially repower. IWEA also notes that the degree to which the repowering potential will be realised in Ireland will be highly dependent on regulatory frameworks and addressing current barriers (e.g. lack of an enabling framework, different definitions of repower, planning restrictions etc.).

³¹ Wind Energy Roadmap 2011-2050, SEAI (2011) | https://www.seai.ie/publications/Wind_Energy_Roadmap_2011-2050.pdf [Accessed 07/06/2021]

Table 6.2: Repower Potential for Clare – Clare Aged 15 years plus in 2020³²

Year	2020 (MW)			2025 (MW)			2030 (MW)		
	15-19	20-24	25+	15-19	20-24	25+	15-19	20-24	25+
Wind Farm Age									
Clare	32	0	0	0	32	0	17	0	32
National Total (MW)	307	109	6	974	307	115	1,040	974	422
National % Capacity	8%	3%	0%	26%	8%	3%	28%	26%	11%

Opportunities for repowering of existing wind farms or extensions to existing wind farms may be considered, but the environmental constraints and visual and landscape sensitivity need to be carefully considered on a case by case basis.

6.6 Policy

The existing Wind Energy Strategy for County Clare is incorporated into the Clare County Development Plan 2017-2023 (Volume 6) and forms the policy basis for onshore wind development in the County.

The planning authority is committed to reviewing the WES once the new National Wind Energy Guidelines are issued. When reviewing the Wind Energy Strategy, Clare County Council will take account of all relevant factors including:

- Landscape capacity and visual impacts, including cumulative impacts;
- Potential of repowering for existing wind farms, including relevant environmental considerations;
- Technological advances in wind and other forms of renewable electricity generation.

³² Adapted from Table 1, IWEA (October 2019). More Power to You: A Guide to Repowering in Ireland.

Chapter 7 Solar Energy

7.0 Strategic aims

The strategic aims of this chapter are:

- To describe the resource.
- To assess its potential and identify factors influencing the preferred locations for its application.
- To set out policy and objectives to ensure solar power contributes to the attainment of renewable energy targets.

This chapter will focus on solar energy at scale (e.g. larger installations, solar farms), and domestic solar installations are addressed in Chapter 10.

7.1 Introduction

This section considers the solar energy resource in County Clare, describing the resource and the associated energy conversion technologies, how it can be harnessed, and setting out policy and objectives to support solar energy developments, which can make a contribution to our renewable energy targets while minimising any adverse impact on the environment.

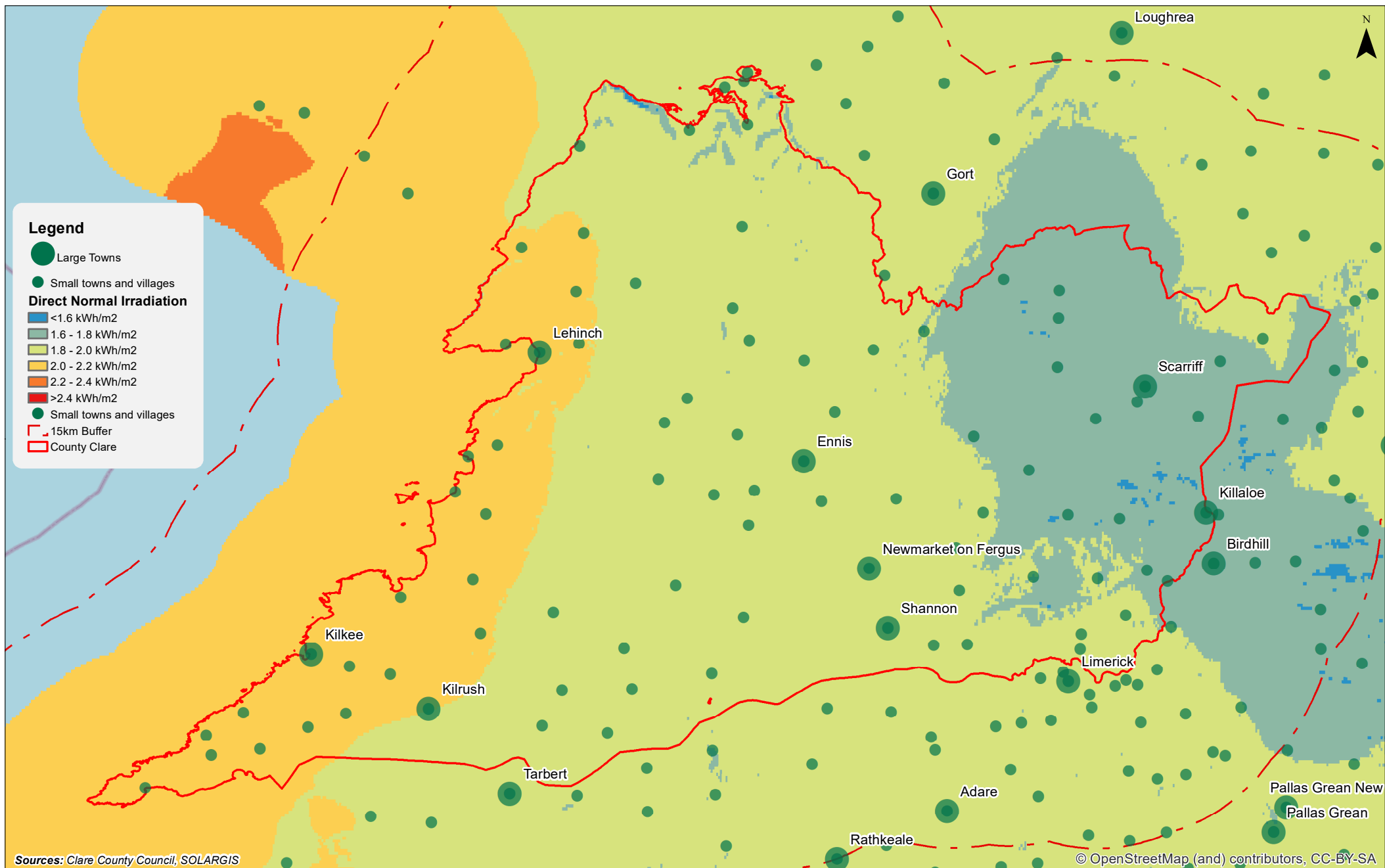
The **Climate Action Plan 2021** increased the ambition of Irelands renewable electricity targets from the 70% outlined in the Climate Action Plan 2019 to 80% and most recently, under Climate Action Plan 2023, solar energy targets have substantially increased from 2.5GW under the 2021 plan to 8GW under the 2023 plan by 2030. Few solar farms have been constructed in Ireland to date, there has been significant planning activity, and permissions for 'utility scale' solar farms are in place throughout the country. There are currently 9 applications for commercial solar energy developments for Co. Clare, with circa 111 MW capacity.

A total of sixty three solar energy projects, none of which are located in the County Clare, have been approved under the RESS 1 Auction.

In Chapter 4, Map 4.1 and Table 7.1 show the location of permitted solar developments in Clare. Map 7.1 shows the solar radiation for Clare.

Table 7.1 Permitted solar developments in Co. Clare

Name	Substation (110 kV)		Capacity (MW)*	Expiry Date	Cumulative Capacity (MW)
	Name	Location			
Total Cumulative Capacity Installed in 2020					0
Firgrove	Drumline	Clare	4	2027	4
Clarecastle	Ennis	Clare	19	2024	23
Spancil Hill	Ennis	Clare	4	2029	27
Cranagher	Ennis	Clare	6.5	2029	33.5
Clonloghan	Drumline	Clare	8	2029	41.5
Ballymorris	Drumline	Clare	4	2027	45.5
Garryncurra	Drumline	Clare	10	2028	55.5
Moanmore	Booltiah	Clare	15	2023	70.5
Manusmore	Ennis	Clare	40	2025	110.5



7.2 The Technology

Solar energy technology harnesses the energy radiated from the sun that reaches the earth as visible light. This light can be categorised as direct and indirect depending on cloud cover and location. Solar energy can be used to produce electricity, heat, or hot water. There are two main categories of technologies that are suitable for installation in Ireland, solar thermal and solar photovoltaic (PV).

In 2019, solar PV energy provided 0.07% of Ireland's electricity generated, producing 21 GWh.³³ In Ireland, solar thermal is generally considered to be suitable for smaller scale applications such as domestic hot water or to meet part of the demand in larger buildings.

Rooftop applications are typical in both domestic and non-domestic settings. The amount of electricity generated also depends on the solar resource, the location, orientation and tilt of the panels and the area covered. The maximum output will be achieved when facing due south, away from shading and at a tilt of 30°. A solar panel, on a clear, sunny day, will produce approximately 150 W per square metre. Strategically placed solar PV panels can provide over 40% of the electricity requirements of a typical domestic dwelling.³⁴ There are also opportunities for the use of Building-integrated solar PV, where solar PV technology is built into materials such as roof tiles and windows.

Ground-mounted solar arrays, or solar farms, can deploy solar PV technology on a small, medium, or large scale. Solar PV panels are installed on rows of mounting systems, orientated and tilted to access the best resource possible. Each megawatt (MW) installed requires approximately 1.5 – 2 hectares of land and 4,000 individual panels. Solar farms export the generated electricity to the grid and therefore the proximity to grid infrastructure must be considered. Other factors contributing to the suitability of a site include the solar resource, slope of the land, accessibility, and the potential for over shading.

Over the decade to 2020, the solar PV technology has improved and become much more cost efficient. This means that utility scale solar installations are competitive with onshore wind as a source of renewable electricity. This creates an energy landscape which allows renewable energy to be more competitive with grid energy without having to be subsidised. Planning permissions are now in place for utility scale solar farms throughout Ireland, with a bias towards the large open fields in parts of the south and east of the country. These projects range in scale from 5MW to more than 100MW.

The following solar energy guidance documents have been published by SEAI. More information in relation to solar energy can be found in Chapter 10.

- Planning and Development Guidance Recommendations for Utility Scale Solar PV Schemes in Ireland
- SEAI Best Practice Guide Photovoltaics (PV) (SEAI)
- SEAI Domestic Solar Photovoltaic Code of Practice for Installers (2021)

7.3 Assessment of Potential for Solar Farms

There are currently no national guidelines in place to guide the location or scale of solar farms. Constraints may arise in relation to landscape impacts, protection of natural heritage or archaeology, or in relation to protecting the high value agricultural land suitable

³³ Energy in Ireland 2020 Report, SEAI (2020) | <https://www.seai.ie/publications/Energy-in-Ireland-2020.pdf> [Accessed 07/06/2021]

³⁴ FAQs on Solar PV, SEAI | https://www.seai.ie/resources/publications/FAQs_on_Solar_PV.pdf

for tillage. Proximity to housing is another factor, although solar farms have limited external impacts beyond the site boundary.

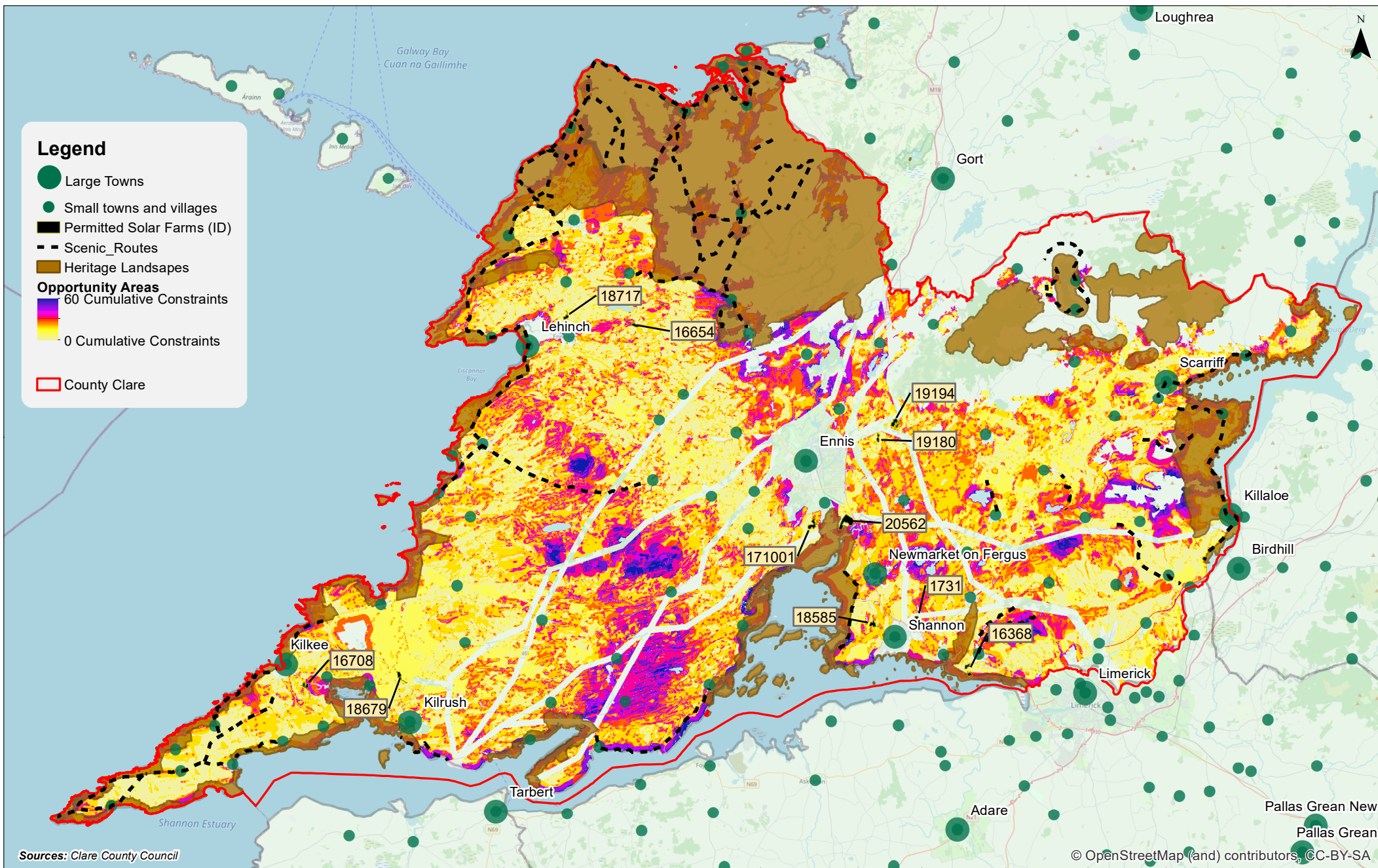
For this RES study, mapping of potential solar resources availability was carried out; Map 7.2 shows "Opportunity Areas" identified as accessible for large-scale (>50MW) solar development following removal of European protected sites, heritage and monuments, settlements and existing infrastructure. A further mapping exercise was carried out to evaluate the number of constraints within the opportunity areas that might have an impact on siting of solar farms. The cumulative constraint level outside the excluded areas is defined by adding up the constraint level assigned (5 for High, 3 for medium and 1 for Low) at certain distances from material assets, sensitive receptors, European Sites and from natural physical attributes (such as groundwater vulnerability, geological heritage sites, soil drainage, landslide and flooding susceptibility). The Cumulative Constraints are displayed on a scale ranging from 0 to 60; this means that a single "High" constraint, given a value of 5, will appear as yellow on the map. However, the presence of a low or high constraint level in and of itself does not support nor preclude solar development; it is a tool which flags areas of having a higher or lower concentration / distance from various sensitive receptors. A proposed solar development would be subject to detailed siting and environmental considerations and the outcomes of the planning process.

The risk mapping suggests that the western part of the county has higher potential for solar farms. Table 7.2 below gives an indication of the scale of energy that might be available. This assumes that just 10% of the available land is used for solar farms. The energy potential from solar energy ranges up to 11,269MW. Map 7.2 also indicates the areas of Historical Landscapes that are likely to preclude solar development. Removing these areas results in a slightly reduced available capacity.

Table 7.2 Potential for Solar Farms

Scenario (Available Area)	Area Available (km²)	Capacity Available (MW)	Cap. Output Potential (GWh)	Capacity Available (MW) at Assumed Delivery Rate of 10%
All Opportunity Areas	2,254	112,692	84,897	11,269
All Opportunity Areas with Historical Landscape areas removed	2,227	111,327	83,870	11,133

These figures are very large. In reality, the number of solar farms will be constrained by external factors such as grid capacity availability and the competitive RESS Auction process. In the RESS Auction process, projects compete on a level playing field across the country, and the most efficient projects will be successful. In the RESS-1 auction, solar farms ranging from about 4 MW up to 120 MW capacity were successful.



Map 16.2 in Chapter 16 shows that within the county, the majority of the distribution network (LV and MV) is concentrated in the centre, while there are also HV transmission lines running from south to north and east to west..

Factors that will influence the uptake of solar in Co. Clare include the competitive process for gaining financial support (RESS auction) and the availability of grid capacity at a local level. Targets have been developed and are set out in Table 7.3.

Taking the starting point of 111 MW permitted capacity and the sharp increase in penetration of solar energy, a total installed capacity of 300 MW by 2030 is not unrealistic.

Table 7.3 Solar Energy Targets by 2030

Solar Resource	Capacity (MW)	Assumptions
Utility Scale Solar Farms and Community Solar Projects	250MW	Further planning applications for large scale solar farms, a proportion of which will be financially viable and proceed to construction Further small solar PV projects at community level.
Rooftop PV installations	50MW	Widespread solar rooftop installations on commercial and industrial buildings throughout the County.
Total	300 MW	Working target for 2030

7.4 Objectives

RES 7.1 Increase the penetration of commercial scale solar energy projects

It is an objective of Clare County Council:

- A. To increase the penetration of utility scale solar energy development in appropriate locations.
- B. To favourably consider the redevelopment of brown field sites for large solar PV projects.
- C. To favourably consider the development of solar farms on agricultural lands which allow for farm diversification and multipurpose land use.

RES 7.2 Promote integration of solar energy

It is an objective of Clare County Council:

- A. To promote and facilitate the use of solar technology across the County including schools, public offices and for infrastructure, e.g. traffic lights, streetlights, road information signage etc.
- B. To promote the integration of solar energy into existing and planned developments, particularly commercial and industrial buildings with large roof areas.
- C. To encourage the use of solar thermal or solar PV installations as part of the design and planning process for new developments and refurbishments.

Chapter 8 Bio-energy

8.0 Strategic aims

The strategic aims of this chapter are:

- To assess the potential for wood energy and energy crops in Clare and identify part of the County broadly suitable for a) development of supply/demand clusters for woody biomass and b) the production of energy crops.
- To set out Clare County Council's policy in support of the industry.
- To set out Clare County Council's objectives for the development of the industry.

8.1 Introduction

The bio-energy sector will play a key role in delivery of renewable heat and renewable transport targets for the County. The Renewable Energy Directive categorises bio-energy into three subgroups which are biomass, bio-liquids, and biofuels. The term biomass encompasses a variety of fuels and technologies used to produce renewable energy.

Bio-energy is energy derived from biological sources, typically organic matter from plants and animals and their by-products. It can be categorised as biomass, biogas, and biofuels. Biomass refers to land and aquatic vegetation, organic waste, and photosynthetic organisms. Depending on the conversion technology employed, biomass can be converted directly to heat and electricity, or used to make biogas or biofuel. Solid biomass tends to be converted directly to heat and electricity by combustion, while wet biomass is digested to form biogas or fermented to produce biofuel. The main types of solid biomass used in Ireland for direct combustion are forest thinnings, sawmill residues, waste wood, willow, miscanthus, straw, residual municipal solid waste (MSW) and tallow.³⁵

Biogas, formed from biomass, can be combusted in boilers to produce heat, or in combined heat and power plants, typically gas engines, to provide both heat and electricity. Alternatively, the biogas can undergo further upgrading to remove the CO₂, to produce an almost pure stream of biomethane. Biomethane to be injected into the natural gas network at appropriate points and transported to consumers. Refer to Chapter 16.4 for more information in relation to gas infrastructure in Clare.

Biomass can also be used to produce biofuels, which serve as a renewable alternative to fossil fuels for transport. Biofuels produced from food crops, called first generation biofuels, are contentious as they compete with food production. Second generation biofuels do not use food crops as their feedstock. They use lignocellulosic biomass or woody crops, agricultural residues or waste, as well as dedicated non-food energy crops grown on marginal land unsuitable for crop production. Second generation biofuels are not produced commercially as of yet, however research is ongoing.^{36 37}

³⁵ Bio-energy Supply in Ireland 2015 – 2035, SEAI (2017) | <https://www.seai.ie/publications/Bioenergy-Supply-in-Ireland-2015-2035.pdf> [Accessed: 26/03/2021]

³⁶ Bio-energy Supply in Ireland 2015 – 2035, SEAI | <https://www.seai.ie/resources/publications/Bioenergy-Supply-in-Ireland-2015-2035.pdf> [Accessed: 26/03/2021]

³⁷ Sustainable Production of Second -Generation Biofuels, OECD (2010) | <https://www.oecd.org/berlin/44567743.pdf> [Accessed 06/06/2021]

According to the SEAI, approximately 3.5% of the energy used in Ireland comes from Irish grown biomass, and by 2035 the bio-energy potential will be close to 30% of 2015 energy demand.³⁸

8.2 Feedstock Sources

8.2.1 Forest Thinning

Forest thinning and residues are a source of biomass that can be used to produce heat, electricity and potentially, biofuels. This resource includes the thinning from forest maintenance and residuals from harvesting. The wood, after a period of drying, can be used directly as logs in domestic boilers and stoves or processed to form chips or pellets to be used in combustion power stations, combined heat, and power plants (CHP) or industrial boilers. This material is also a feedstock for the advancing production of second-generation biofuels. Forestry has the largest potential to expand at current market prices for energy. Co. Clare has a significant forest area (17.2%) cover, offering a high potential for bio-energy from forest residue. In 2019, private afforestation in Clare accounted for 352 ha, the second highest in the country for this period. Similar material can be obtained from sawmill residue or waste wood sources.³⁹

8.2.2 Energy Crops

Energy crops act as a bio-energy feedstock, including wheat and oilseed rape (OSR) which are used in biofuel production. Wheat can be used to produce bioethanol, while biodiesel can be formed from OSR. Both crops are currently grown in Ireland but are not used for domestic biofuel production as refineries must be quite large to achieve economies of scale and the availability of the resource is limited. Sugar beet and maize can both act as feedstock for biogas production, with sugar beet also being used to produce bioethanol.⁴⁰ Ireland also has the potential to grow miscanthus and willow, forms of solid biomass for direct combustion. Crops are typically grown in Ireland for food, fodder, or exportation. The potential for expansion into the energy market faces the challenges of land-use competition, availability of land and profitability. Grass silage in Ireland offers a large resource for biogas production, albeit at a greater cost.⁴¹

8.2.3 Agricultural Waste and Residues

Agricultural waste and residues, such as straw, pig manure and cattle manure, can be used to produce biogas at little to no cost. Straw produced as a by-product in crop production can be combusted to produce electricity and heat and is a potential resource for second-generation biofuels. The slurry and manure from cattle and pigs can be used to produce biogas, which can then be combusted or further transformed into biomethane for gas network distribution.

³⁸ Bio-energy | SEAI (2017) | <https://www.seai.ie/sustainable-solutions/renewable-energy/bioenergy/> [Accessed: 04/06/2021]

³⁹ Forest Statistics Ireland 2020, Teagasc (2020) | <https://www.teagasc.ie/media/website/crops/forestry/advice/Forest-Statistics-Ireland-2020.pdf> [Accessed 06/06/2021]

⁴⁰ Bio-energy Supply in Ireland 2015 – 2035, Teagasc (2017) | <https://www.seai.ie/resources/publications/Bioenergy-Supply-in-Ireland-2015-2035.pdf> [Accessed: 21/03/2021]

⁴¹ Assessment of Cost and Benefits of Biogas and Biomethane in Ireland, SEAI (2017) | <https://www.seai.ie/publications/Assessment-of-Cost-and-Benefits-of-Biogas-and-Biomethane-in-Ireland.pdf> [Accessed: 21/03/2021]

8.2.4 Other By-Products and Residues

Other process by-products and residues that can act as a feedstock for bio-energy production include tallow, used cooking oil (UCO), food waste and residual municipal solid waste (MSW). Tallow, produced during meat processing, can be converted to biodiesel, or used as a heating fuel. Used cooking oil is currently collected from food services and industries and used in the production of biodiesel. Food waste has the potential to be used for biogas production and residual MSW can be burned in a waste-to-energy process to produce heat and electricity.

8.3 Conversion Technologies

Bio-energy technologies have the potential to contribute towards renewable energy targets for heat, electricity and transport in the domestic, commercial and industrial sectors.

8.3.1 Biomass Combustion / Combined Heat and Power

Direct combustion is the simplest method of bio-energy production. This is typical of solid biomass which is converted to heat through combustion. Forest thinning's, sawmill residues, waste wood, willow, miscanthus, straw, residual MSW and tallow are the main types of solid biomass used for direct combustion in Ireland.⁴² Combined heat and power (CHP) is the process by which electricity and heat can be produced from biomass.

8.3.2 Anaerobic Digestion

Anaerobic digestion (AD) is the process used to produce biogas. Grass silage, domestic and industrial food waste, and pig and cattle slurry provide the feedstock for the process. The biomass is broken down anaerobically in biodigester plants to produce the biogas. Biogas is composed primarily of methane (CH₄) and carbon dioxide (CO₂), and may have small amounts of hydrogen sulphide (H₂S), moisture and siloxanes.

Micro-organisms break down the organic material in the absence of oxygen. The process is operated under controlled conditions in sealed tanks. In this anaerobic environment, biochemical reactions occur that convert organic polymers from the feedstock into methane rich biogas and nutrient rich digestate. Anaerobic digestion works best at temperatures of 30°C to 60°C and typically takes anything between 14 and 40 days to complete.⁴³

The biogas produced can be combusted to create heat or used to generate electricity. The electricity can be used in the facility or be exported to the grid while the digestate can be pasteurised at high temperatures to remove pathogens, and then used as a fertilizer. Biogas can also be upgraded to biomethane by removing impurities such as CO₂ and H₂S.

The energy output from an anaerobic digestion plant greatly depends on the biomethane potential of the feedstock. High-energy feedstocks such as glucose or kitchen waste will have much higher energy yields than feedstocks such as grass cuttings. Those organic feedstocks with the highest biomethane potential contain 10 times more energy than the lowest biomethane potential feedstocks, such as sewage sludge.

⁴² Bioenergy Supply in Ireland 2015 – 2035, SEAI (2017) | <https://www.seai.ie/publications/Bioenergy-Supply-in-Ireland-2015-2035.pdf> [Accessed: 06/06/2021]

⁴³ Anaerobic Digestion for on-farm uses – Overview, SEAI (2020) | <https://www.seai.ie/publications/Anaerobic%20Digestion%20-%20Overview%20Guide> [Accessed 06/06/2021]

Anaerobic digestion can be undertaken on a scale ranging from small farm-based AD plants to large industrial AD plants, with a range of technology from simple to very sophisticated and highly mechanised and automated systems.

Further information on anaerobic digestion is included in Chapter 14.

8.3.3 Gasification

Biomass can also undergo gasification, a process by which a mixture of carbon monoxide, carbon dioxide and hydrogen, called syngas, is produced. This syngas can then be used to generate electricity. The gasification process involves the incomplete combustion of solid biomass, such that the resulting gas still has combustion potential.

8.3.4 Biorefinery

A biorefinery is a complex and integrated system of processes and plant in which biomass is converted to wide range of products. It is modelled on the convention fossil fuel based refineries.

8.4 Assessment of Potential

Solid biomass will play a substantial role in industry to replace coal and oil, in buildings requiring high temperature heating where it substitutes some oil and totally replaces peat and coal.

8.4.1 Biomass

Having regard to the key facts and trends emerging from the assessment of potential for the woody biomass industry, it is the Council's policy to support and encourage the development of bio-energy opportunities, facilities and associated enterprises in Co. Clare. As regards biomass potential, the focus of this RES is on the identified heat centres and areas where there is potential to plant energy crops in conjunction with the harvesting of existing forest plantations. Clare County Council recognise that the development of this industry will play a significant role in meeting renewable heat targets and in attracting economic investment and job creation to the County.

The success of bio-energy projects is heavily dependent on the availability of the resources. Co. Clare's large forestry and agricultural sectors present opportunities for the provision of forest thinning and residues, straw and animal manure and silage. A common failure factor for bio-energy plans is competition for land use, particularly food crop production. There is reluctance to use edible plants or good quality arable land for energy crop production. Therefore, success is more likely when harnessing residue from existing industries, such as forest materials and animal by-products. The price of conventional fuels also plays an important role in the success or failure of bio-energy projects. The cost of feedstock production, transportation and processing must be compared to that of other energy sources to determine if it is economical.

8.4.2 Wood Energy

The forest area of Co. Clare is 55,106 ha, or 17.2 %. The County has a total forest area of 55,106 or 17.2% and Clare is second for private afforestation by county with 352 hectares⁴⁴. Public sector forestry supplies (Coillte) are forecast to remain at existing levels or to decline slightly in the medium term. 45% of the existing forestry cover in County

⁴⁴ Forest Statistics Ireland 2020, Teagasc (2020) | <https://www.teagasc.ie/media/website/crops/forestry/advice/Forest-Statistics-Ireland-2020.pdf> [Accessed 06/06/2021]

Clare (23,360 hectares) is in public ownership. Private forestry (55%) will continue to be an important source of expansion in the wood fuel supply. Maps 8.1 and 8.2 show areas of forestry cover in County Clare relative to nearby counties, Limerick, Tipperary, Kerry and Galway. The majority of the resource in Co. Clare is located in the East and West of the County, centred around Scarriff and Connolly respectively. County Clare is ideally placed with a substantial biomass resource to serve identified areas of heat demand. With transport costs being a critical viability factor in the industry, this creates an opportunity in County Clare to develop sustainable supply / demand clusters for wood biomass and energy crops thereby minimizing transport distances.

The age profile of forestry is a key factor in determining its sustainability for production and supply. The 11-15 years and 16-20 years are the plantations approaching first thinning. Planting activity in County Clare peaked in the mid 1990's with the result that many plantations may have passed the age for first thinning thus lessening the opportunity for the harvesting of pulp wood to supply the renewable heat industry. This is an important factor to note in terms of supply within the County and may necessitate further new planting together with the importing of product from the wider region. Fortunately, County Clare has the benefit of an excellent road network between its neighbouring counties of Limerick and Galway and also has the benefit of existing port facilities at Moneypoint and Shannon International Airport.

Factors which will influence the decision to carry out thinning of woodland include the provision of site access from public roads and access to the plantation i.e. forest road. In County Clare, this will require a more targeted approach to identify the number and locations of new properly constructed entrances, or improvements to existing access routes, in consultation with the relevant forestry bodies, to ensure that forestry plantations are accessible.

In building on this existing demand, this RES recognises the potential for the abundant biomass resource in the County to serve the existing areas of high heat demand. The target for renewable energy from biomass outlined in this chapter will be dependent on a number of factors, including whether fuel is burnt in facilities that only generate electricity, or those which produce combined heat and power, or is burned in a boiler that produces heat only. The amount of fuel required in each case will depend on the efficiency of the combustion process as well as the number of hours in a year a facility is operational.

8.4.3 Energy Crops

The SEAI has quantified the bio-energy potential in Co. Clare on a 50m by 50m grid for miscanthus, reed canary grass and willow. Each grid square has been assigned a category of bio-energy suitability (high, medium, low, unsuitable, unavailable). This suitability assessment undertaken by the SEAI has considered existing land use, existing agriculture and forestry, soils, topography, average annual and seasonal rainfall. Designated conservation areas, archaeological areas and residences have also been considered. It should be noted this data is provided by the SEAI as *indicative suitability* only, and there may be competing land uses which could affect the viability of bio-energy crop usage. Any planned or future developments in relation to use of crops for bio-energy would need to be assessed in detail on a project by project basis, and subject to feasibility/technical studies and appropriate environmental assessments in the first instance.





SEA AA and RES of Clare Co Dev Plan

Projection: IRENET95 Irish Transverse Mercator

Scale: 1:450,000 (A4)

Date: 30/11/2021

Drawn: NR

Checked: IP

Approved: CB

Status: Final

Rev: F01

File Ref: CP20027Arc0005F01



Clare County Council

Map 8.2

Biomass Resource - Miscanthus and Forestry



Table 8.1 Energy Crop Opportunities in County Clare⁴⁵

Available Area (Hectares)	231,932
SRWC Highly Suitable	105,827
Miscanthus	99,310
Reed Canary Grass	132,155

Map 8.1 shows grades of suitability for Short Rotation Coppice (SRC) Willow across the County. Two main areas emerge.

- **Area 1:** Map 8.1 indicates that the Limerick/Shannon/Ennis corridor is suitable to develop a supply / demand cluster for SRC Willow bio-energy crop. Similarly, to woody biomass, the economic viability and environmental sustainability of energy crops for fuel is greatly influenced by the distance between supply centre and demand centres. The shorter the distance to the end user, the more viable the resource becomes.
- **Area 2:** The opportunities to exploit pockets of suitability along the west coast will depend on the ability of large heat demand users along the west coast switching to biomass boilers. Such potential users may include hotels and spas, guest houses, hostels and visitor centres.

Map 8.2 shows Miscanthus suitability across Co. Clare. This map indicates three areas of high miscanthus suitability:

- **Area 1:** North Clare, between Ennis and Lahinch.
- **Area 2:** Loop Head peninsula
- **Area 3:** Throughout East and South Clare

8.4.4 CHP and District Heating

Having regard to the 'supply/demand' spatial pattern emerging from examination of woody biomass and energy crops, the Council consider that there is the opportunity to develop a number of CHP plants and associated district heating in the County.

In conventional electricity generation, much of the input energy is lost to the atmosphere as waste heat. In Ireland 55% of the input energy is lost with the remaining 45% being transformed into electricity.⁴⁶ Combined Heat and Power (CHP) systems channel the waste heat to useful purposes, such as a district heating (DH) network, which connects the power plant to heat customers (e.g. industry, residential etc.). A 25% energy saving can be achieved using CHP compared to the separate production of heat and electricity. Such a facility can attract a dynamic mix of other related uses, including green energy development, industry / green energy generation, Research and Development (R&D), and biorefining etc. to a low carbon zone.

Areas of high heat demand in County Clare may have potential to accommodate CHP facilities. In the Shannon zone, Shannon town has been the subject of a detailed energy

⁴⁵ Adapted from RASLRES Energy Crop Opportunities for the Western Region, pg 13

⁴⁶ (SEAI 2010)

needs study and energy modelling⁴⁷ which has identified an existing energy use breakdown of 57% thermal and 43% electric (industrial, commercial and residential sectors) which is a good match for combined heat and power. Moreover, the Shannon Town and Environs Local Area Plan 2012-2018, in sections 3.5.6 and 8.3.2, identifies a site in Shannon which may be suitable for a green energy development, potentially a CHP facility.

Opportunities may also present along the Shannon Estuary area, in particular the Kilrush / Moneypoint area, where co-firing of biomass at the existing power station may be possible. In addition, having the existing port resource here would enable the importation of additional biomass fuel. The Strategic Integrated Framework Plan for the Shannon Estuary (SIFP), to which regard has been had in the preparation of this Strategy, recognises the role that Moneypoint can play as part of a strategic energy hub, facilitating the growth of other synergistic industries such as renewable energy and combined heat and power.

Map 4.1 identifies CHP units in Clare and Table 8.2 outlines a planned bio-energy development in Stonehall, County Clare which includes CHP and storage facility for district heating.

Table 8.2 Planned bio-energy developments in Clare

Name	Type	Maximum Export Capacity
Carbon Sole	Biomass processing and storage using forestry products, Gasification, Methanation, Production of advanced biofuels, CHP, Battery Storage, Thermal Energy Recovery, and storage facility for district heating distribution	5 MWe (electricity), 14 MWt (thermal)

8.4.5 Anaerobic Digestion

There is potential for the deployment of micro anaerobic-digestors in Co. Clare, due to the wastes produced by the agriculture and forestry sectors. Table 4.2 in Chapter 4 outlines targets for anaerobic digestion in County Clare.

Full assessment of potential for AD in Co. Clare requires an estimation of the potential installed capacity from the total available manure resource including cattle, pig and poultry. In addition, it requires assumptions regarding the percentage of animal manure produced which will be captured by AD, together with other waste streams. Such exercises are beyond the scope of this strategy. Anaerobic digestion is discussed further in Chapter 14.

Factors influencing the spatial location of AD facilities and associated planning policy and objectives for their provision are explored further in Chapter 17. Planning applications for AD plants should be accompanied by traffic impact assessment and road safety audits.

⁴⁷ Limerick Clare Energy Agency, 2012

8.5 Objectives

RES 8.1 Increase the penetration of bio-energy projects

It is an objective of Clare County Council:

- A. To maximise bio-energy use in the County in order to make a proportional contribution to meeting, or exceeding, national targets for renewable heat and transport of 24% and 10% respectively by 2030.
- B. To facilitate an increase in the percentage of sustainable energy crops grown throughout County Clare, to prepare a suite of measures that will assist in developing the market for biomass energy crops and facilitate such alternative farm enterprise.
- C. To support initiatives for energy research funding and to encourage the development of bioenergy opportunities, facilities and associated rural enterprises in the countryside in appropriate locations where such activities do not have a significant negative impact on the environment and where they assist in the diversification away from fossil fuels to green energy.
- D. Development of biomass crops such as willow or miscanthus will consider potential environmental effects in relation to land use changes and in particular will assess potential for likely significant effects on Natura 2000 sites and other environmental sensitivities as identified by the EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool. Sustainable best practice in the growing of biomass and in the associated forestry management shall be encouraged:
 - The planning of biomass will be in accordance with the following guidance: Miscanthus Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011); and
 - Short Rotation Coppice Willow Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011)

RES 8.2 Support Bio-energy development

It is an objective of Clare County Council:

A. To support and encourage the development of bio-energy opportunities, facilities, and associated enterprises having regard to the effects of land use change.

B. To encourage commercial bio-energy proposals to satisfy the following criteria:

- Located close to the point of demand and is served by public roads with sufficient capacity.
- In a central location within the supply catchment area in order to minimise road hauls.
- Located close to the point of demand to facilitate sustainable district heating networks.
- Proximate to grid or gas network or large heat demand end users. In line with national policy and proper planning and sustainable development.

RES 8.3 Brownfield and industrial bio-energy development

It is an objective of Clare County Council:

To generally permit proposals for commercial bio-energy plants on brownfield sites adjacent to industrial / enterprise areas or on lands which are in industrial / enterprise use or zoned for such purposes.

RES 8.4 Bio-energy promotion

It is an objective of Clare County Council:

- A. To facilitate an increase in the percentage of sustainable energy crops grown throughout County Clare, to prepare a suite of measures that will assist in developing the market

for biomass energy crops and facilitate such alternative farm enterprise.

- B. To promote the installation of district heating schemes.
- C. To implement best practice in 'green' public procurement.
- D. To showcase the wood biomass boiler at the Clare County Council headquarters for demonstration purposes and to promote the use of biomass heating for all public buildings within the lifetime of this strategy.

RES 8.5 Transportation and Access

It is an objective of Clare County Council:

To facilitate the development of new or upgrading of existing entrances and off road turning and loading areas to forest plantations, in association with Coillte, The Forest Service, Teagasc, The Clare Wood Energy Project and relevant land owners subject to all environmental considerations.

RES 8.6 Monitoring Land Use Change

It is an objective of Clare County Council:

To explore ways to monitor land use change, particularly in relation to energy crops, forestry and other energy related changes that may have implications for land-use, landscape and biodiversity across the County.

Chapter 9 Marine Renewables

9.0 Strategic Aims

The strategic aims of this chapter are:

- To briefly profile offshore wind, wave and tidal energy.
- To clarify Clare County Council's role in relation to the industry.
- To set out policy, objectives and targets to assist the development of the marine renewable sector.

9.1 Introduction

The term 'marine renewables' or 'marine energy' normally refers to wave, tidal and offshore wind. The offshore wind, wave and tidal resource off the coast of Co. Clare has the potential to offer a significant source of renewable energy, along with associated spin off supporting industry such as construction, distribution and information communications technology (ICT).

The geographical benefits of Co. Clare that make it a desirable location to exploit this renewable resource include:

- Large coastal area
- Wind speeds
- Wave height
- High capacity factor
- Strong transmission grid

9.2 The Technology

The main technologies relating to marine renewables are included in this section.

9.2.1 Wave Resource

The kinetic energy and power contained in waves can be harnessed and converted into electricity. The average wave height off the coast of Ireland is 2.5 to 3m and the power generated is a function of the wave height, speed and water density. Many different prototype devices for the capture of wave energy have been developed by several different companies.⁴⁸

9.2.2 The Tidal Resource

Technologies can be used to harness kinetic energy associated with tidal/marine currents - tidal ebbs and flows. One of the major advantages of harnessing energy from marine currents, over other renewable energy resources, is that it is predictable over long time scales. Clare has an excellent marine current energy resource. In the open sea, speed of ebbs and flow is relatively slow, but it can be higher when there are topographical constraints like islands and headlands. Site specific energy data is required to determine whether tidal flows can be used effectively. Similar to wave devices, there are currently a broad and diverse range of technologies under development for harnessing tidal energy.

⁴⁸ SEAI Draft Methodology for Local Authority Renewable Energy Strategies Dec 2011 section 2.2.5 p10

The SIFP states that the Shannon Estuary is macro-tidal having the largest tidal range on the Irish coast (5.44m at Limerick Docks) and considerable potential as a tidal energy resource. It identifies 4 potential sites in the Shannon Estuary which could harness this tidal energy - Kilconly Point, Carraig Island, Tarbert Bay and adjacent to Moneypoint. The SIFP recognises the potential of these sites for research and development in a sensitive manner.

9.2.3 The Offshore Wind Resource

The Climate Action Plan (2021), increased the target for offshore wind from 3.5 GW to 5 GW by 2030. The target for offshore wind was further increased to 7 GW by 2030 after an agreement was reached on Sectoral Emissions Ceilings in July 2022. Further clarity on this target was provided under Climate Action Plan (2023) whereby 2 GW of this 7 GW is to be allocated specifically for green hydrogen production. SEAI predict that Ireland's offshore wind energy potential is at least 30 GW, whilst analysis carried out by WindEurope indicates that there is over 70 GW of offshore wind potential within a 36-hr wet-tow from the Shannon Estuary⁴⁹. Clare is ideally placed to maximise the offshore wind power potential and contribute to meeting this ambitious target.

In the period up to 2030, development of turbines along the east coast of Ireland, using conventional foundations to the sea-bed (fixed bottom), is expected to be the basis for achieving offshore energy targets. Offshore wind projects along the Atlantic Seaboard are more likely to be based on floating wind turbine technology, given the depth to the seabed. Floating wind turbines still require further research and development and testing, which is expected to advance over the period to 2030. During this period planning for development of projects off the coast of Co. Clare and associated on-land infrastructure, is expected to proceed.

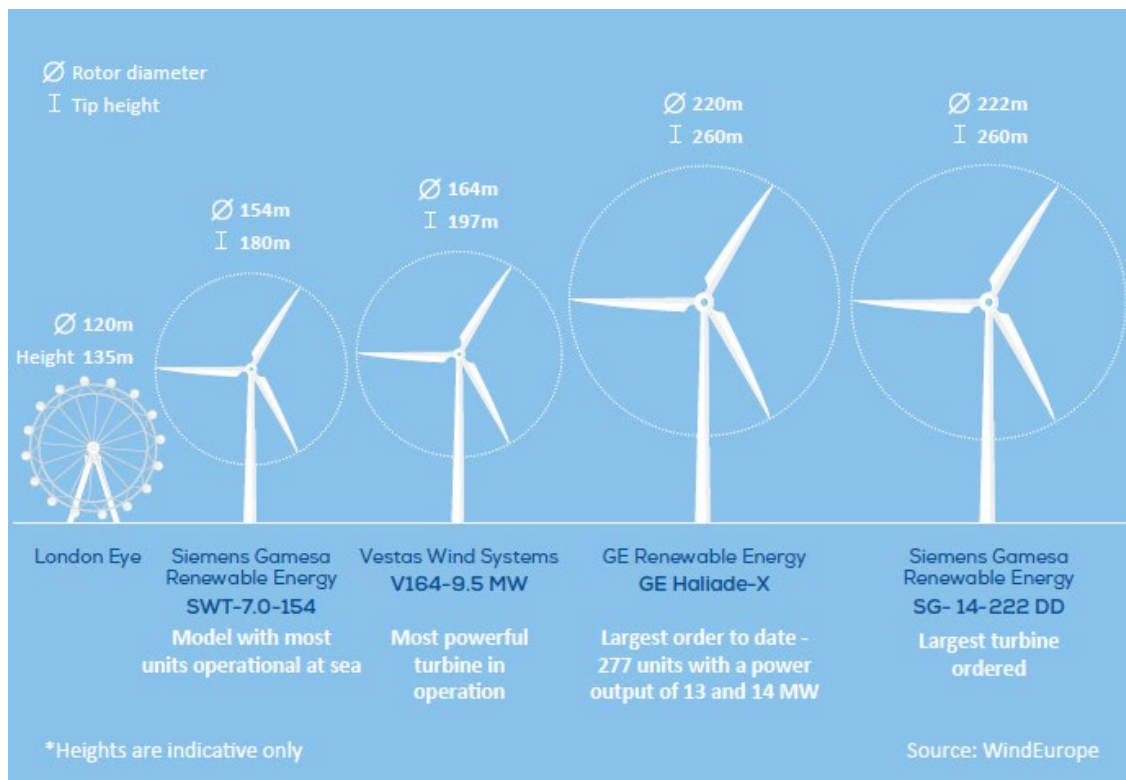
Fixed-bottom wind turbines

Fixed bottom offshore wind turbines are similar in design to onshore wind turbines. The turbine is built into the sea floor. Turbine dimensions have increased as technology matures, with turbines now reaching 200m tip height and with capacity of 10MW or more per turbine. Fixed bottom turbines are currently the industry standard for offshore wind farms.

Floating offshore wind turbines

Floating technology allow the turbines to be located far from shore and in waters over 100m deep, reducing visibility from shores and potentially in locations where winds are steadier and higher. Traditional fixed bottom turbine foundations would be uneconomical at these locations.

⁴⁹ Shannon-Foynes Port Company Strategic Review, section 4.1, p42, SPFC (2022)



Scale of Offshore Wind Turbines (from A 2030 Vision for European Offshore Wind Ports, Wind Europe)

9.3 Assessment of Potential of the Offshore Wind Resource

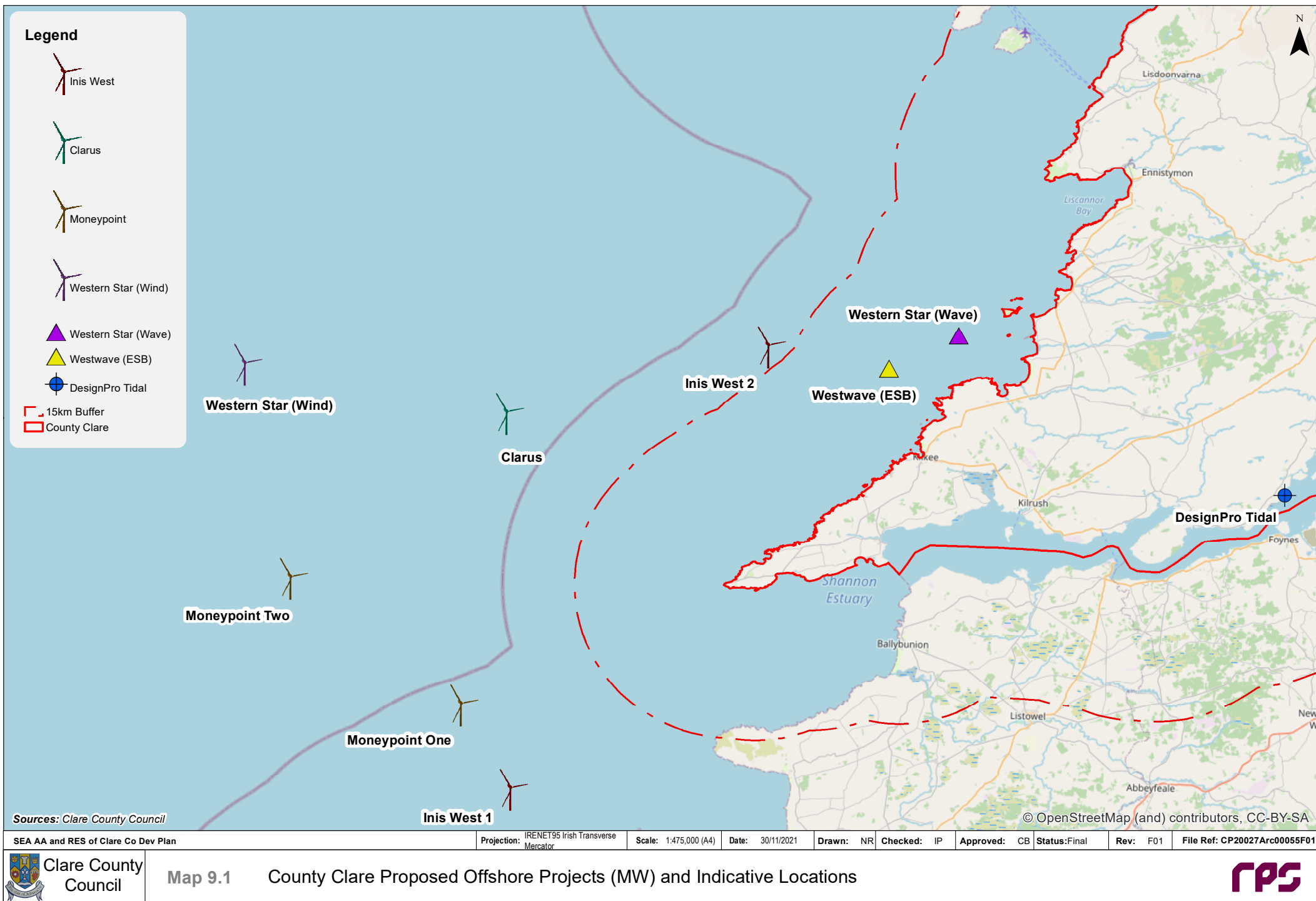
The development of marine renewable energy test sites is a key component to Ireland's Ocean Energy Strategy. There are two wave energy test sites and one proposed tidal testing site off the coast of County Clare. There are six offshore wind farm developments in the pipeline in Co. Clare.

Details of the offshore renewable energy projects off the coast of Clare are included in Table 9.1 and identified on Map 9.1.

Table 9.1 Marine Renewables in Clare

Test Site	Location	Marine Renewable Type
WestWave - ESB	52.7586; -9.7018	Wave
Western Star – Simply Blue Energy (Wave)	52.789365; -9.599185	Wave Energy Conversion
DesignPro Cahiracon Quay Tidal Energy Testing	Cahiracon Townland, Clare	Tidal
Moneypoint 1	16 km offshore	Floating Wind
Moneypoint 2	36 km offshore	Floating Wind
Western Star	35 – 60 km offshore	Floating Wind
Clarus	30 km offshore	Floating Wind
Inish West 1	11km offshore	Floating Wind
Inish West 2	16km offshore	Floating Wind
Rian Offshore Array*	Tbc. >22km offshore	Floating Wind

*Indicative location of Rian Offshore Array is outside the boundary of Map 9.1.



This abundant resource is evidenced in the designation of the Clare coastline as part of Area 5 (West coast) in the Offshore Renewable Energy Development Plan (ORED P). Area 5 is stated as having the potential to accommodate a total of 18,500 – 19,500 MW of energy from offshore wind and wave energy. This Strategy seeks to ensure that the County delivers the maximum possible share of this potential. The ORED P Interim Report also identifies the Shannon Estuary as a potential location for tidal energy and wave energy. While the ORED P is primarily focused on delivering the State’s 2030 generation ambitions through fixed-bottom wind turbines, the Offshore Renewable Energy Development Plan II (ORED P II), which is scheduled to be published in 2023, will focus predominantly on unlocking the potential of floating wind generation off the Atlantic coast.

9.4 Policy

Local Authorities will primarily be concerned with the onshore elements of offshore wind farms such as cable landfall and onshore grid connection infrastructure which would facilitate this type of project but will also have an important role during the consent process for offshore wind farms.⁵⁰ Protecting the marine environment and the seascape and landscape character of the County is an important consideration.

Clare County Council will seek to plan ahead for offshore energy development. Early consideration of the following factors will be beneficial:

- Opportunities to improve or expand port facilities to enable offshore investigation and construction processes, and for servicing future wind farms
- Identification of constraints and opportunities for landfall locations where renewable energy is brought ashore, harnessed, delivered to the domestic market, and integrated with the wider pan-European energy generation and transmission system
- Implications for the electricity grid, gas grid and transport infrastructure to enable good alignment with offshore energy resources to be considered
- Environmental sensitivities and constraints, to ensure that development does not come at an unacceptable cost to the environment and heritage of the county to be considered
- Enterprise and employment opportunities, and how to maximise local benefit from new offshore investment to be considered.
- The potential and negative impacts of development on the commercial activities and livelihoods of those in the fisheries industry will be recognised and evaluated through consistent engagement with fishing interests and communities throughout the planning and development consent process.

This forward planning will be carried out by means of feasibility studies, in partnership with government and relevant state agencies.

⁵⁰ Draft Methodology for Local Authority Renewable Energy Strategies, section 2.2.1 p7, SEAI (2011)

ESB Moneypoint Clean Energy Hub

Moneypoint must stop using coal by 2025, and instead look to greener options. The 300 acre site is located at a deep water port making it an attractive option for on-and-off-shore proposals. ESB plans to transform, under National Climate Action Policy, the largest power station in Ireland into a clean energy hub 'Green Atlantic'. Currently, the site is under review for different options:

- **Floating Offshore Wind Farm:** ESB are exploring the feasibility of developing Moneypoint Offshore Wind Farm off the West Coast of Ireland. The €5bn plan to help decarbonise the power network is expected to produce enough electricity to generate 1,400MW (1.6 million homes), and if successful, to start producing power in the next decade.
- **Renewable Enablement:** ESB has already commenced a €50m Sustainable System Support facility project. A Synchronous Compensator with the largest flywheel of its kind in the world was completed in 2022. It will provide a range of electrical services and enable higher volumes of Renewables on the system.
- **Hydrogen Energy:** ESB has also included a green hydrogen production, storage and generation facility as part of their investment plans. A clean, zero-carbon fuel, produced from excess renewable production, has been shown to potentially compliment clean electricity, to further help decarbonise the heat and transport sector. Industries like pharmaceuticals, electronics, and cement manufacturing can also benefit.



ESB depiction of potential integrated energy development at Moneypoint.

9.5 Objectives and Targets

RES 9.1 Support the National Marine Planning Framework

It is an objective of Clare County Council:

- A. To implement and support the streamlined consent system, connection arrangements, and the funding supports for new technologies offshore.
- B. To promote regional cooperation in terms of offshore renewable energy development, environmental monitoring and awareness of the benefits of realising the Regions' offshore energy potential.

RES 9.2 Facilitate the development of Marine Renewables

It is an objective of Clare County Council:

- A. To support the ocean energy research, development and demonstration pathway for emerging marine technologies (wave, tidal, floating wind) and associated test infrastructure.
- B. To support the sustainable development of offshore wind energy at appropriate locations and related grid infrastructure.
- C. To maximise the opportunities provided by the Shannon Estuary's strategic location and its' deep water for marine renewable energy development.

RES 9.3 Strategic Marine Energy Infrastructural Development

It is an objective of Clare County Council:

- A. To work in partnership with the marine renewable energy sector (wave, tidal and offshore), DECC, EirGrid

RES 9.3 Strategic Marine Energy Infrastructural Development

and other relevant stakeholders to deliver the key actions recommended by the Offshore Renewable Energy Development Plan (OREDPA) and DS3 Programme, ensuring that electricity generated off the coast of County Clare can be exported to the demand market subject to the requirements of all environmental legislation, and taking into account the OREDPA SEA Environmental Report and the Natura Impact Report.

- B. To support the strengthening of the electricity grid to accommodate offshore renewable energy and its connection to the national grid.
- C. To enable facilities on shore to convert renewable energy generated offshore to be transformed, stored, converted and transported effectively.

RES 9.4 Marine Energy Service and Port Infrastructure

It is an objective of Clare County Council:

- A. To actively explore and pursue opportunities to service the marine renewable energy sector at existing ports, to facilitate the growth of new ports, supporting infrastructure and associated development, in compliance with the Strategic Integrated Framework Plan for the Shannon Estuary and any future coastal zone management plans.
- B. To facilitate the expansion of ports and provision of additional quayside harbour working areas and /or additional quay length to further enhance their attractiveness to marine renewable industry developers.

RES 9.5 Marine Energy Research and Development

It is an objective of Clare County Council:

- A. Support the ocean energy research, development and demonstration pathway for emerging marine technologies (wave, tidal, floating wind) and associated test infrastructure.

- B. Support innovation enterprise hubs and the supply chain for offshore renewable energy.

RES 9.6 Forward Planning for Offshore Energy

It is an objective of Clare County Council:

To carry our feasibility studies and other forward planning initiatives to enable offshore renewable energy to develop while protecting the environment, maximising local economic and social benefit, and enabling efficient development of supporting infrastructure. This will be done in co-operation with relevant government departments and public agencies.

Chapter 10 Micro Generation

10.0 Strategic aims

- To define micro generation and the term micro-renewables
- To briefly outline domestic, commercial and agricultural micro generation technologies that are exempt from the requirement to procure planning permission having regard to the Planning Acts and Regulations.
- To promote the use of micro generation technology in County Clare.

10.1 Introduction

Micro generation is particularly suitable for domestic and commercial purposes. The Council encourages small businesses to harness opportunities presented by the use of micro renewables, reducing energy costs down and increasing competitiveness.

There are numerous definitions of micro generation. For the purpose of this Strategy and in keeping with the ESB classification, micro generation is classified as grid connected electricity generation up to a maximum of 11kW when connected to three phase portions of a distribution grid (400v). The vast majority of domestic and agricultural customers are connected to the single phase portion of the distribution grid (230v) and for these customers to be classified as micro-generators the maximum technical rating permitted is 5.75kW.⁵¹

The concept of micro generation can also apply to where energy is created and consumed on site and is not exported to the grid. In this context, it is understood as zero or low carbon heat and power generated by individuals, small businesses and communities to meet their individual energy needs.⁵²

It is acknowledged that on-site / decentralised heat and electrical micro generation can have a significant impact on reducing carbon emissions from dwellings and businesses.

10.2 Technology

The micro-renewable technologies are outlined below. Details on these technologies are described in the respective chapters of this Renewable Energy Strategy.

- Solar photovoltaic panels (PV)
- Small free standing wind turbines
- Micro scale CHP plants
- Hydroelectric schemes
- Solar hot water panels
- Micro scale biomass heating and wood burning stoves
- Ground source heat pumps
- Air source heat pumps

⁵¹ Guide to connecting microgeneration, SEI (2009) | <https://www.seai.ie/publications/Guide-to-Connecting-Micro-generation-to-the-Electricity-Network.pdf> [Accessed 07/06/2021]

⁵² Microgeneration, IWES | www.iwes.com/index.cfm/page/microgeneration [Accessed 02/02/2021]

Small scale battery storage systems are often employed as part of a micro-generation approach, for example a house with solar PV panels might also install a battery to store energy for use during the evening and night time, and to charge electric vehicles.

10.3 Assessment of Potential

Micro generation and the introduction of new renewable technologies conflicts with the traditional use of coal and peat and this is a major behavioural change that needs to be tackled throughout Ireland. Education and awareness initiatives need to be improved to provide more information to the general public about micro-generation technologies and their benefits. Another key barrier that will need to be addressed is the perceived high initial cost of capital, high installation costs, long pay-back periods. However, the large proportion of agricultural land and one-off housing within the county means there is suitable space for small-scale wind turbines, ground and/or roof mounted solar PV panels or small-scale CHP plants.

There is also a well-established Sustainable Energy Community (SEC) network within Co. Clare. These SECs promote and raise awareness of micro generation technologies in Co. Clare. Information on SECs is outlined in Chapter 18.

Micro Wind

In general, there is a very good wind resource in Co. Clare. However, due to differences in local climate conditions, wind speeds and directions, along with ground conditions and obstructions, potential can vary from site to site. Sites must therefore be assessed individually for wind energy micro-generation suitability. Generally speaking, the ideal location is on top of a high tower on a south westerly facing hill with gently sloping sides surrounded by clear countryside which is free from obstructions such as trees, houses or other buildings. Here the wind flows relatively smoothly and steadily enabling it to drive wind turbines with greater efficiency. The Irish Wind Energy Association (IWEA) recommends carrying out a detailed assessment of the wind resource of a potential site, including erecting a wind monitoring mast at turbine height for at least 12 months. This will give more accurate information on the wind resource on the site in terms of both wind speed and direction, distribution and levels of turbulence and will indicate the varying level of annual energy production.

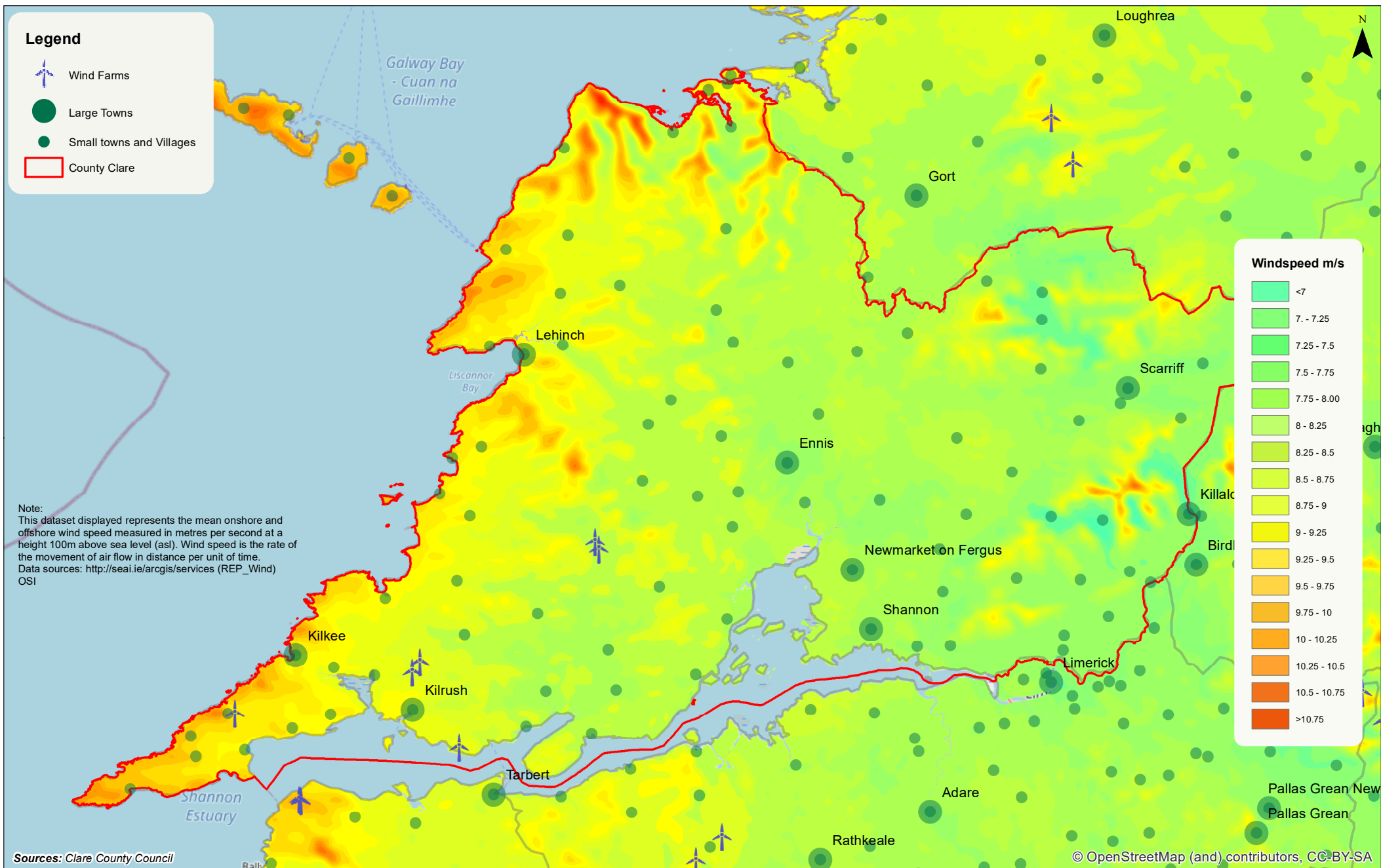
The **SEAI Wind Map**⁵³ (see Map 10.1) shows the wind speed at different heights across the county. The wind resource in Co. Clare is better in the west of the county. The highest wind speeds in the County are located at north west and south west with wind speeds reaching 10.4 m/s at a height of 20m. The output of a turbine is greatly affected by the wind speed as the power developed in wind is proportional to the speed of the wind cubed; a turbine at 20 m with a rotor diameter of 8 m, assuming a power coefficient of 35 %, will generate approximately 9 MW at a wind speed of 6 m/s and 73 MW at a wind speed of 12 m/s.

Solar PV

With the most common silicon solar panels typically 1 sq. m of panels will generate ~150W of power on a clear sunny day, enough to power a laptop computer. A home solar PV system sized at 20 m² (~3kW) would generate around 2,600kWh of electricity a year if well-located, over 40% of the typical annual electricity demand of an Irish home.⁵⁴ The suitability of a site for solar depends on the solar resource, slope of the land, accessibility and the potential for over shading.

⁵³ Wind map, SEAI (2021) | <http://maps.seai.ie/wind/> [Accessed 06/06/2021]

⁵⁴ FAQs on solar PV, SEAI (2016) | https://www.seai.ie/resources/publications/FAQs_on_Solar_PV.pdf [Accessed 06/06/2021]



The SEAI domestic solar PV electricity calculator estimates annual savings of €236/year and an estimated payback period of 16 years in Clare.⁵⁵

Solar Thermal

The level of heating provided by solar thermal collectors depends on the solar resource, the efficiency of the technology and the area covered by the solar collectors. The preferred location for solar collectors is on a south-facing roof with a tilt angle of 30° to 45°. Southeast and southwest facing installations are also viable, with only a 5% reduction in the output.⁵⁶ In domestic applications, the systems can typically provide 50% to 60% of the annual hot water requirement. Water heating accounts for 19% of residential energy use nationally.⁵⁷ A solar thermal collector system installed on a dwelling in Co. Clare has potential to reduce the energy consumption of that dwelling by 0.16 tonnes of oil equivalent.

With a three metre square solar collector installed, it can be expected that electricity usage for hot water will reduce by between 1200 and 1500 kWh (units of electricity) per year. This is equal to between €192 and €240 annually.⁵⁸

It is difficult to quantify the current use of solar thermal systems in the County as planning permission has not been required for their installation since the Planning and Development Regulations S.I No. 83 of 2007 came into effect. However, statistics derived from the SEAI Home Energy Upgrades Scheme show that 24% of homes in Co. Clare have availed of the scheme upgrade. This scheme provides an option for a Solar Water Heating Grant and Solar Electricity Grant.⁵⁹

Micro Combined Heat and Power (CHP)

In 2015 the national operational capacity of biomass fired CHP plants was 5.4 MWe (Megawatt electrical), accounting for 1.7% of the total capacity. Nationally, hotels and leisure centres account for 41% of CHP units in the services sector and the hospital sub-sector accounts for 11%. These sub-sectors benefit from having close to relatively consistent demand for heat and electricity. Micro CHP plants allow domestic users to generate their own electrical energy onsite using locally available woodchips. Heat generated can be used to heat the dwelling, displacing oil heating systems.

Heat Pumps

Renewable heat technology, including air source and ground source heat pumps, is outlined in Chapter 12 of this RES.

10.4 Policy

The Microgeneration Support Scheme (MSS) announced in January 2021 is being designed to enable individuals, farmers, businesses and community groups to sell renewable electricity into the grid. Under the scheme, micro-generators can sell 30% of the excess

⁵⁵ Solar electricity calculator, SEAI (2021) | <https://www.seai.ie/tools/solar-electricity-calculator/> [Accessed 06/06/2021]

⁵⁶ Homeowners Guide to Solar Thermal, SEAI | <https://www.seai.ie/resources/publications/Homeowners-Guide-To-Solar-Thermal.pdf> [Accessed: 06/06/2021]

⁵⁷ In domestic applications, the systems can typically provide 50% to 60% of the annual hot water requirement.

⁵⁸ Solar panels, Electric Ireland | <https://www.electricireland.ie/residential/help/efficiency/solar-panels> [Accessed 06/06/2021]

⁵⁹ Statistics for Home Energy Grants, SEAI (2020) | <https://www.seai.ie/grants/home-energy-grants/home-upgrades/> [Accessed 06/06/2021]

electricity they produce and export it back to the grid. The scheme design seeks to establish the 'renewables self-consumer' model of energy generation and consumption in Ireland to achieve 2030 targets for renewable energy. There is no charge to connect a micro-generator to the ESB network. There is a charge of €340 to install an import/export meter.

Smart digital meters are essential for electricity users to become part of the Smart Grid. Ireland has huge potential for growth in the renewable energy sector. However, it is important for consumers to become more aware and engaged with consumption and energy use. Smart digital meters will give people control and more choice when it comes to their energy practice. For example, a smart meter allows a person to change their energy use to a time when the grid is not under pressure or supplied mostly with renewable energy and therefore has lower electricity tariffs and cleaner energy.

10.5 Objectives

RES 10.1 Support the framework for microgeneration

It is an objective of Clare County Council:

- A. To support the national framework for micro-generation which tackles the existing barriers and establishes suitable supports within relevant market segments.
- B. To promote the uptake of incentives, schemes, grants and other available funding to improve energy efficiency.

RES 10.2 Facilitate micro-renewable energy installations

It is an objective of Clare County Council:

- A. To encourage the retro fit of domestic and commercial buildings with micro generation technologies and improve the environmental performance of buildings.
- B. To promote the use of micro-renewable technologies throughout the County for all redevelopment / extension / expansion projects.
- C. To encourage all developers at planning application stage for new buildings in the residential, industrial, commercial and agricultural sectors to demonstrate how the energy needs of the proposed development can be provided for with indigenous renewable energy resources, harnessed by incorporating micro renewable technologies, as an important element in establishing a low carbon County and assisting in meeting assigned renewable energy targets.

Chapter 11 Micro Hydroelectric Power

11.0 Strategic Aims

The strategic aims of this chapter are:

- To describe the resource, how it works and identify the theoretical potential.
- To identify planning issues and constraints to the development of micro hydro power.
- To set out policy and broad criteria of planning considerations to be applied in assessing hydro schemes applications having regard to relevant environmental legislation.
- To set out objectives.
- To support micro hydropower developments which can make a contribution to our renewable energy targets while minimising any adverse impact on the environment.

11.1 Introduction

Co. Clare has a proud tradition of hydro schemes. In 1929, the Ardnacrusha hydro electric power station was the biggest of its kind in the world and produced 90% of Ireland's energy needs.

The County also has significant potential to accommodate smaller scale hydro power development. Due to the undulating nature of the County and the presence of numerous water bodies, the opportunity exists to provide appropriately scaled hydro electric power stations. Where a suitable resource exists, with access to the grid and / or a corresponding local electricity demand, a micro hydro-power site can provide a strong financial return, as well as contributing to a reduction in carbon use as a renewable energy source.

There are approximately 100 potential micro hydro sites in Clare with domestic potential and 15 with commercial potential. Although it is beyond the scope of this Strategy to assess flow and head data for each location (together with other site suitability considerations), this chapter identifies 4 no. commercial sites (see Table 11.2 in this chapter) with potential to harness micro-hydroelectric power in County Clare.

11.2 The Resource

11.2.1 Hydro power electricity

Hydro power is derived from the energy from falling water. Water flowing from a higher to a lower level is used to drive a turbine which produces mechanical energy. This mechanical energy is usually turned into electrical energy by a generator. Schemes can be classified as low head schemes or high head schemes based on the geographic characteristics of the site. Plants operating with a head of over 150m are referred to as high head, those in the 20m-150m range are medium and those below 20m are classified as low head. Run of the river schemes are those where water is taken from a river from behind a low weir with no facility for water storage and returned to the same water course after passing through a turbine.

11.2.2 Scale

The focus of this chapter is on small scale projects. The International Energy Agency classifies hydropower plants with electrical generating capacity of:

- 10MW to 1 MW as small scale
- 1MW to 100 KW as mini installations
- 100kW to 1 kW as micro scale

Depending on their mode of operation, hydro power systems are classified as reservoir or 'run of the river' schemes. This chapter focuses on run of the river only. Hydro power schemes are further classified according to the geographic characteristics of the site - the vertical distance between the water intake and outlet levels being either a high head or low head.

In 2017, hydropower accounted for 2.3% of Ireland's electricity generation, producing 692 GWh.

Within Co. Clare planning permission has been granted to build a turbine house and install a micro hydro electric turbine with intake and outfall to the Ballymacrean river and associated site works at Kilcornan, Ennistymon.

Planning permission has also been granted and works commenced for the redevelopment of an existing hydro electric scheme including a new turbine house and all associated ancillaries at The Falls, Ennistymon. The 220 kilowatt water turbine serves up to 60 to 70% of the hotel's annual energy needs, and this can reach 100% in the winter.

11.3 Assessment of potential

Currently, there are two micro hydroelectric power sites existing in County Clare. Details of these two sites are outlined in Table 11.1.

Table 11.1 Micro hydroelectric sites in Clare

Site No. on SEAI Map	River	National Grid Reference	Potential Inst. Cap. (kW)	Potential Annual Energy (MWh)
20	Cullenagh	R128 885	40	160
172	tributary of Glennageer river	R165 770	8	28

Potential locations within Co. Clare were identified by the SEAI for micro hydroelectric power installations. The theoretical potential throughout the county is outlined in Table 11.2.

This resource was mapped by the SEAI from comprehensive information identified in the then Department of Energy's 1985 report 'Small Scale Hydro Electric Potential of Ireland'.⁶⁰ As such, this map and the identified sites in Clare outlined in Table 11.2 are indicative of micro-hydropower potential only. It is noted that some sites may also be located in or in proximity to sensitive sites (including European sites). As such, any proposal for hydro-power development would need to be subject to a feasibility or technical study, as well as detailed environmental assessment and subject to the outcomes of the planning process at project level.

⁶⁰ HydroMap, SEAI (2021) | <https://gis.seai.ie/hydro/> [Accessed 06/06/2021]

Table 11.2 : Potential Locations for Micro-Hydropower Generation in Co. Clare

Site No. on SEAI Map	River	National Grid Reference	Potential Inst. Cap. (kW)	Potential Annual Energy (MWh)
22	Fergus	R233 919	71	262
33	Cullenagh	R131 878	18	92
48	Inagh	R168 850	70	347
169	Fergus	R355 777	84	375

Source: SEAI Hydropower Potential Mapping: <http://maps.seai.ie/hydro/>

The following sites have also been identified as having potential for commercial hydro power in the County:

- 1) Old Mill, Ennis,
- 2) Clondegad, Ballynacally,
- 3) Moananagh, Inagh; and
- 4) The Weir, Sixmilebridge

11.5 Policy

The key factor for success or failure of micro hydroelectric power is site selection. Site selection must consider the environmental impact, the resource availability and the proximity to the required infrastructure.

In terms of the required resource, the availability and variability must be considered. Sufficient flow and head must be present in the water to generate electricity. Furthermore, where there is no water storage area, the variability of the water flow will determine whether it can be easily integrated into the grid.

One of the key failure factors for hydropower development plans is the environmental and landscape impact during construction and operation. Hydropower installations operate by disrupting the flow of the watercourse, which may impact on biodiversity in the area. The visual amenity of the area is also impacted during construction, and to a lesser extent during operation.

The transmission and distribution network, along with the road network, are important supporting infrastructure for hydropower construction and operation. Success will depend on the availability of these supports near the proposed site.

While there is high technical potential for hydro power in the County, the realisable / accessible potential will be greatly influenced by specific site conditions and how any environmental impacts can be avoided, managed or mitigated. Rehabilitation of existing mills may be more economically attractive than the development of green field sites.

While Clare County Council generally supports micro hydro power in appropriate locations, as a means of contributing towards our renewable energy targets, there may be occasions where some hydro schemes are unacceptable because of potential ecological damage. Clare County Council shall work constructively to find an acceptable solution in cooperation with the environmental prescribed bodies and the applicant / developer where possible.

The Planning Authority is also available to give any further guidance or pre-planning advice to prospective developers as and when required. All future proposed sites for hydro power will be assessed on a case-by-case basis.

11.6 Objectives

RES 11.1 Facilitating Micro Hydro Power

It is an objective of Clare County Council:

To facilitate the development of micro hydro power developments on a case by case basis, where proposals comply with requirements of the Habitats Directive, Birds Directive, the River Basin Management Plan, the provisions of the Clare County Development Plan 2023 - 2029, with the '*Guidelines on the Planning, Design, Construction and Operation of small scale hydro electric schemes and Fisheries*' (DCENR and Inland Fisheries Ireland) and other related legislation/ guidance that is available , in accordance with proper planning and sustainable development.

RES 11.2 Environmental safeguards specific to Micro Hydro Power

It is an objective of Clare County Council to ensure environmental protection in relation to the development of Micro Hydro Power (MHP) projects.

- An Ecological Impact Assessment should be carried out to identify all ecological factors, including ecological corridors. The assessment should include appropriate surveys, undertaken at the correct time of year by a suitably qualified and experienced ecologists, and including appropriate mapping of habitats.
- A number of plant species protected under the Flora Protection Order, 1999, may occur in some of the identified areas. Breeding sites and resting places of otter, and potentially of bats will require survey for these species to comply with the Wildlife Acts and Regulations.
- Development of MHP must be undertaken in a sustainable manner with regard to the fisheries resources within the river. This will include assessment of the

fisheries resource and appropriate design mitigation measures. Developments of MHP must ensure that they do not impede the ability for fish to migrate upstream, such as fish passes. Consultation will be required with the IFI in relation to the development of any of the MHP sites identified in this strategy.

- A full archaeological, and/or architectural heritage assessment may be required in relation to any proposed application in relation to MHP.

Chapter 12 Renewable Heat

12.0 Strategic Aims

The strategic aims of this chapter are:

- To focus on the application of heat collection technology and its potential contribution to meeting National thermal energy targets.
- To assess potential for renewable heat technologies in Clare.
- To set out policy and objectives for the uptake of renewable heat technologies.

This chapter focuses on heat pumps and district heating; renewable heat from biomass is dealt with in Chapter 8.

12.1 Introduction

Ireland must transition rapidly to renewable heat in order to meet the government's 7% annual reduction in CO₂ emissions. This can be done by supporting sustainable, efficient and economic renewable heat technologies.

Heat represents 40% of the national energy use. 90% of thermal energy use is from fossil fuels.⁶¹ 130 ktoe of energy were consumed as heat energy in Co. Clare in 2020, accounting for 41% of total energy consumption in the county. The majority of this consumption took place in the residential sector, with the rest occurring in industry and services.⁶² Clare's thermal energy consumption is highly dependent on oil, with 56% of Clare's total energy consumption provided by oil, followed by electricity at 20%⁶³.

This section considers renewable heat in Clare, describing the resource and the associated energy conversion technologies, how it can be harnessed and setting out policy and objectives to support renewable heat developments which can make a contribution to our renewable heat targets while minimising any adverse impacts on the environment.

12.2 The Technology

Heat energy is difficult to transport over a significant distance in an efficient way. As a result, heat energy tends to be generated from a diverse range of technologies, using a diverse range of fuels, installed close to each individual demand site. Renewable heat technologies include CHP, solar thermal for water heating and heat pumps – both ground source and air-source - for space and water heating. A number of sources of surplus heat are also considered renewable heat. This surplus heat will play a significant role in supplying low-carbon, low-cost heating to urban centres in Ireland with district heating.⁶⁴

The use of micro CHP is also discussed in Chapter 10. Waste-to-energy is explored in Chapter 14.

⁶¹ 40 by 30 Renewable Heat Plan, Renewable Energy Ireland (2021) | https://renewableenergyireland.ie/wp-content/uploads/2021/05/Renewable-Energy-Ireland_Renewable-Heat-Plan_-_Final.pdf [Accessed 06/06/2021]

⁶² Clare Energy Emissions Balance, (2021)

⁶³ Clare Energy Emissions Balance, (2021)

⁶⁴ 40 by 30 Renewable Heat Plan, Renewable Energy Ireland (2021) | https://renewableenergyireland.ie/wp-content/uploads/2021/05/Renewable-Energy-Ireland_Renewable-Heat-Plan_-_Final.pdf [Accessed 06/06/2021]

Heat Pumps

Heat pumps work similarly to a refrigerator: they absorb heat and transfer it to another medium. Boilers generate heat by burning fuel and converting the chemical energy in the boiler fuel into heat. A heat pump system consists of three linked systems:

- Source (air, ground or water), from which heat is extracted;
- Heat pump, extracts heat from the source and upgrades the heat to a higher temperature; and
- Heat distribution system.

Air Source Heat Pumps (ASHP)

An air source heat pump (ASHP) works by transferring heat absorbed from the outside air to an indoor space, such as a home or an office via the wet central heating systems to heat radiators and provide domestic hot water. They are therefore dependent on the seasonal fluctuations of the outside temperature.

Ground-Source Heat Pumps (GSHPs)

Ground-source heat pumps (GSHPs) exploit geothermal energy to provide space heating and cooling. Ground-source heat pumps utilise the low temperature geothermal resources closer to the surface, which act as a heat source during heating and a sink into which excess heat is released during cooling. Geothermal energy offers a reliable resource as the temperature of the earth below a certain depth, typically ten metres, is relatively stable. Ground-source heat pumps are potential replacements for conventional oil, coal or gas boilers and can be used in both domestic and non-domestic applications.

The system typically consists of a collector loop, a heat pump, and a distribution system. Ground-source heat pumps require electricity during heating and cooling operations; however, the heat pump produces three to four units of heat for each unit of electricity consumed. GSHPs can be categorised based on their collector types; closed-loop systems and open-loop systems.

A closed-loop system consists of a closed loop of pipes buried in the ground, through which a heat transfer fluid circulates. The fluid extracts heat from, or releases heat to, the ground as required. The pipes can have a horizontal or vertical configuration, depending on the availability of land and cost requirements. A horizontal system is installed in a shallow trench, typically 1.5 m below the surface, while vertical systems access more stable temperatures between 6 m and 120 m through installing collectors in drilled boreholes or wells.⁶⁵ The horizontal configuration requires a larger availability of land, however, the lack of drilling required makes it a lower cost installation. A closed loop system can also be installed in ponds or lakes.

An open-loop system extracts groundwater from a well or borehole through a vertical configuration and transfers it to a heat exchanger for energy extraction. The water is then re-injected to the source or discharged elsewhere. The limitations of an open-loop system include the proximity to a groundwater source, the potential for water contamination and pipe corrosion.

65 Lucia, U., Simonetti, M., Chiesa, G. and Grisolia, G. (2017). Ground-source pump system for heating and cooling: Review and thermodynamic approach. *Renewable and Sustainable Energy Reviews*, Volume 70, p. 867-874. <https://www.sciencedirect.com/ucd.idm.oclc.org/science/article/pii/S1364032116310504> [Accessed 06/02/2021].

Note: This chapter does not assess potential for deep geothermal having regard to the excessive depths involved.

District heating

District heating is a system for distributing heating comprising of a boiler which generates hot water and a network of connected underground pipes to distribute the hot water to customers. The central boiler can be fired by fossil fuels, biomass, geothermal or nuclear sources. Co-firing occurs where boilers can fire a mixture of fuel sources. District heating plants can provide higher efficiencies when the boiler provides both heat and electricity - this system is known as Combined Heat and Power (CHP). District Heating systems are widespread in Europe. These systems often integrate surplus heat from facilities such as industry, data centres and waste-to-energy plants and power plants, making them an efficient low-carbon heat source. The surplus heat from industrial processes or data centres for use in district heating is also a great way to attract commercial businesses to a location. Data centres are a rapidly growing segment of the Irish economy and energy system⁶⁶.

12.3 Assessment of Potential

Clare has readily available renewable energy resources and technologies available that will allow the renewable heat transition to have significant economic benefits, particularly in the rural communities.

The heat demand for Clare based on SEAI mapping is provided in Table 12.1. This describes the spatial distribution of heat demand in the urban areas of the county. The highest heat demand is in the electoral division of Clenagh, followed by the urban areas of Ennis.

Table 12.1 : Heat Demand for Co. Clare 2015

ED Name	Heat demand (MWh)	Water heat demand (kWh/m)	Road heat demand (kWh/m)	Building Demand (KWh)	Commercial Heat Demand (MWh)	Industrial Heat Demand (MWh)	Heat demand 2025 (MWh)	Population
County	615,089	303,094	301,063	33,080	41,190	23,918	531,482	117,196
Clenagh	54,222	25,959	47,558	4,480	6,618	15,870	47,143	10,058
Ennis	31,360	24,109	120,567	20,062	29,995	4,013	26,277	4,965
Kilrush	15,722	14,473	15,370	1,004	2,177	259	13,374	2539
Kilkee	9,496	3,845	4,309	457	2,831	0	7,735	1037
Scariff	8,189	3,429	2,068	297	619	318	6,854	1,361

Heat Pumps

The amount of heat pumps in Ireland continues to grow. In Ireland, there are approximately 41,000 heat pumps in operation.⁶⁷ Air source heat pumps are considered to more

⁶⁶ 40 by 30 Renewable Heat Plan, Renewable Energy Ireland (2021) | https://renewableenergyireland.ie/wp-content/uploads/2021/05/Renewable-Energy-Ireland_Renewable-Heat-Plan_Final.pdf [Accessed 06/06/2021]

⁶⁷ Heat pumps in operation, Ireland, Statista (2021) | <https://www.statista.com/statistics/740518/heat-pumps-in-operation-ireland/> [Accessed 06/06/2021]

common, with approximately 34,600.⁶⁸ In the NECP, the expected level of penetration of heat pumps to achieve ambitious renewable heat targets is 600,000 (400,000 in existing buildings) by 2030 in the residential sector.

Good insulation is needed to reduce draughts in the home and eliminate heat losses through open chimneys, which will affect the performance of the heat pump system. There are a number of energy efficiency measures that should be implemented prior to installing a heat pump.⁶⁹

- Thermal efficiency of the building (or process) must be as high as possible.
- Improving air tightness as well as increasing thermal insulation is important
- Improving the thermal efficiency is likely to reduce the cost of a heat pump system.
- Improving the thermal efficiency of a building greatly reduces running costs.

SEAI will provide guidance on measures that may be necessary to ensure that the dwelling fabric heat loss is lowered to an acceptable level for a heat pump system to perform at its best. The requirements for a dwelling to qualify for an SEAI Home Energy grant for a heat pump system is that the dwelling has low heat loss. Some of the measures that can help achieve this are insulation upgrades such roof and wall insulation upgrades, which are grant aided under SEAI's Home Energy Grants programme.

Ground-Source Heat Pumps (GSHP)

Geological Society of Ireland (GSI) have prepared a national shallow geothermal energy resource map which will enable informed decision making and preliminary site suitability assessments. GSI have also produced '*A Homeowner's Guide to Ground Source Heat / Shallow Geothermal Energy*' to assist in the uptake and successful installation of ground source heat.

The SEAI Geothermal Mapping System⁷⁰ has classified Co. Clare as "Probably suitable" for open loop (domestic & smaller commercial) suitability. It classifies the county as "possibly unsuitable" for vertical closed loop GSHPs with assessments specific to each site required. More information of GSHP is provided in Chapter 7.

An outline of the mapping information for Co. Clare that is available from GSI is included in Table 12.2.

Table 12.2 Geothermal Suitability in Clare

Geothermal Suitability	Suitability Class	Suitability Description
Vertical closed loop suitability	2	Possibly unsuitable (site assessment required)
Open loop (Domestic & Smaller Commercial) suitability	3	Probably suitable (unless proved otherwise / site assessment required)
Open loop (Larger Commercial & Industrial Processes) suitability	2	Possibly unsuitable (site assessment required)

⁶⁸ Heat pumps in operation, Ireland, Statista (2021) | <https://www.statista.com/statistics/740518/heat-pumps-in-operation-ireland/> [Accessed 06/06/2021]

⁶⁹ Heat pump implementation guide, SEAI (2020) | <https://www.seai.ie/publications/Heat-Pump-Implementation-Guide.pdf> [Accessed 06/06/2021]

⁷⁰ Geothermal mapping, SEAI (2021) | <http://maps.seai.ie/geothermal/> [Accessed 06/06/2021]

The following factors are considered to influence the potential for horizontal systems (shallow):

- Adequate depths of suitable type of subsoil (0.6–1m depth required to bury horizontal array of pipe network).
- Generally moist soil that will conduct heat.
- Subsoil permeability – generally soils with low permeability hold moisture and therefore are better suited than quick draining sandy soils.
- Ground water vulnerability – Shallow soils with rock outcrop will not be appropriate for horizontal systems.
- Space required to install the system – rural versus urban context.

Combined Heat & Power / District Heating

Ireland has one of the lowest shares of DH in Europe at less than 1% of the heat market. The economic feasibility of a DH system in a region depends on the heat density of the region, baseline heating costs and heat supply price.

There are no district heating systems in operation in Co. Clare at present. The Irish District Energy Association has developed an **All Island Heat Atlas** which explores the potential for District Heating. The largest heat demand in the county is Ennis and Shannon. Areas in these towns are 'Suitable for District Heating' with heat density areas of 120 -300 TJ/km². Based on the heat demand classification of the Heat Atlas, other areas of Co. Clare are feasible subject to policy regulation and support. Development in DH technology could increase the feasibility of DH systems in other areas.

Potential for DH shown in Table 12.3 is based on Heat Demand Atlas mapping.

Table 12.3 Suitability for District Heating in Clare

Suitability for District Heating	Heat Density	Locations within County Clare
Very high DH suitability	>300 TJ / km ²	
Feasible for DH	120 – 300 TJ / km ²	Ennis, Shannon
Feasible Subject to Policy / Regulation	50 – 120 TJ / km ²	Clarecastle, Ennis, Kilkee, Kilrush, Newmarket-on-Fergus, Shannon, Sixmilebridge
Future potential	20 – 50 TJ / km ²	Ballyvaughan, Corofin, Crusheen, Ennistymon, Kilkee, Kilrush, Kilmihil, Lahinch, Lisdoonvane, Milltown Malby, Tulla,

There are also opportunities to provide district heating in Ennis and Shannon where large heat users such as schools, industrial estates, hospitals and existing housing are located proximate to land zoned for new housing. For reasons of economies of scale, such systems are particularly suited to urban areas and industrial zones where the required densities of

development are available. The majority of dwellings in the County are dispersed in rural locations with low heat density, rendering them unsuitable for DH development.⁷¹

The proposed renewable energy development by Carbon Sole Ltd. in Stonehall, Newmarket on Fergus, Co Clare includes the provision of the construction of a thermal energy recovery and storage facility for district heating distribution.

The potential for the uptake of CHP at a domestic or commercial scale in Co. Clare is discussed in **Chapter 8**.

12.4 Policy

Ireland was obliged to achieve a minimum target of 12% of heat to come from renewable sources by 2020 under the EU Renewable Energy Directive 2009/28/EC⁷², and is looking to achieve 24% heat from renewable sources by 2030. As of 2019, this figure stood at 6.3%. Ireland's low share of renewable heat is a key reason for a failure to meet 2020 renewable energy targets. Nationally, renewable heat is dominated by biomass in industry. There has been an increase in the use of renewable heat in the residential sector with the uptake of air-source heat pumps. In 2019, the useful heat from CHP met 5.7% of Ireland's total thermal energy demand.

In July 2021, the EU commission agreed to revise the Renewable Energy Directive (RED) for completion in Q1 2023. The basis of the target for renewable heat (or RES-H) will change from an indicative nature to a binding nature. This requirement will underpin a new National Heat Policy Statement currently being developed by government and also the proposals for legislation to underpin the structures necessary to remove blockages and to accelerate the transition to renewable heat. A new Heat and Built Environment Delivery taskforce is currently being established to focus on the heat sector. Its aim is to accelerate and drive delivery in retrofitting, renewable heat, district heating and decarbonisation of Ireland's building stock. In addition, the government has agreed to introduce a renewable heat obligation on the heat sector by 2024 to incentivise suppliers of all fuels in the heat sector to provide a portion of renewable energy for heating.

To enable actions to reverse the increasing trend of emissions from the heat sector, A National Heat Study was published by the SEAI in February of 2022. The study provides a rigorous and comprehensive analysis of the options to reduce CO₂ emissions associated with heating in Ireland, provides new insights and proposes actions that should be taken to turn around rising emissions from this sector.

Under Ireland's Climate Action Plan the new Government aims to complete 500,000 home retrofits to achieve a Building Energy Rating of B2 cost optimal equivalent and roll out 600,000 (400,000 in existing buildings) heat pumps in residential buildings by 2030. Ireland is committed to promoting the widespread adoption of heat pumps and other renewable heating options.⁷³

National policies of relevance include;

⁷¹ Heat Atlas, Irish District Energy Association (2018)| <https://www.districtenergy.ie/heat-atlas>

⁷² Renewable Energy in Ireland, SEAI (2020) | <https://www.seai.ie/publications/Renewable-Energy-in-Ireland-2019-Infographic-.pdf> [Accessed 06/06/2021]

⁷³ Best Practices and Policy Solutions for Ireland's 2030 Heat Pump Target, International Energy Research Centre, Ireland, IERC (2020).| <http://www.ierc.ie/wp-content/uploads/2020/11/Best-Practices-and-Policy-Solutions-for-Irelands-2030-Heat-Pump-Target-1.pdf> [Accessed 06/06/2021]

- White paper – Ireland’s Transition to Low Carbon Energy Future 2015-2030, which mentions that increased decarbonisation of home heating will be vital to Ireland’s energy transition.
- Ireland’s National Energy and Climate Plan (NECP) states that there is a clear priority given to prioritise electrification and use of heat pumps in new domestic and commercial buildings driven by building regulations.
- Ireland National Climate Action Plan has a significant focus on low carbon heating and retrofitting of existing buildings with electricity-powered heat pump systems.
- The National Home Retrofit Scheme is a Government grant scheme aimed to upgrade homes towards achieving the Government Climate Action Plan. The funding is designed to encourage groups of private households, registered Housing Associations and Local Authorities in the delivery of energy efficient upgrades and renewable energy usage, specifically in domestic buildings.

The **Support Scheme for Renewable Heat (SSRH)** has been designed to replace fossil fuel heating systems with renewable energy technologies. The Scheme will contribute to meeting Ireland’s 2030 renewable energy and emission reduction targets. It will focus on heat users in the Non-Emissions Trading (non-ETS) sector. This includes commercial, industrial, agricultural, district heating, public sector, and other non-domestic heat users. The Scheme is made up of two support mechanisms – an on-going operational support for biomass boiler and anaerobic digestion heating systems and an installation grant for electric heat pumps. The Scheme is now open for applications for heat pump installation grants

The **Energy Efficiency Obligation Scheme (EEOS)** places an obligation on energy suppliers and distributors to deliver energy savings. Energy suppliers have targets, credits are achieved through energy saving projects to make homes or businesses more energy efficient.⁷⁴

High Efficiency CHP cogeneration plants are eligible for tax relief from **Carbon Tax**. Tax relief takes into the consideration the higher efficiency and reduction in emissions of the CHP plants.⁷⁵

Public bodies are identified as key enablers of District Heating, particularly where larger scale co-ordination of projects is required among diverse stakeholders. The development of DH will require coordinated, local-level action to effectively plan for successful wide-spread DH implementation. Most barriers to development of DH are non-technical, as the technologies used are themselves not new or innovative. With the large domestic biomass resources in Co. Clare and suitability of the towns such as Ennis with relatively high heat densities, DH has the potential to integrate more renewables into the heating system and reduce the County’s dependency on oil.

However, there are limited guidelines, regulations, policies, frameworks, or standards for DH in Ireland. A national policy framework to encourage the development of DH is planned, as outlined in the national level energy white paper Ireland’s Transition to a Low-Carbon Energy Future, but since this paper was published, there has been no announcement on the timeline of this framework. Also, heat energy is required and created at an individual building level and is therefore fundamentally a local level issue. The role of local authorities is crucial in the development of DH. There is a need for integrated land-use, energy, and infrastructural planning in order to progress DH development, and the local authorities are

⁷⁴ Energy Efficiency Obligation Scheme, SEAI (2017) | <https://www.seai.ie/business-and-public-sector/business-grants-and-supports/energy-efficiency-obligation-scheme/obligated-parties/> [Accessed 06/06/2021]

⁷⁵ HE CHP, Revenue (2019) | <https://www.revenue.ie/en/companies-and-charities/excise-and-licences/energy-taxes/he-chp/index.aspx> [Accessed 06/06/2021]

ideally placed to oversee that this integration occurs. Most local authorities in cities with DH have used planning policy and local regulations to promote and develop DH.

12.5 Objectives

RES 12.1 Support the framework for Renewable Heat

It is an objective of Clare County Council:

- A. To maximise renewable heat technologies in the County in order to make a proportional contribution to meeting, or exceeding, national targets for renewable heat of 24% by 2030.
- B. To support the national framework for renewable heat which tackles the existing barriers and establishes suitable supports within relevant market segments.
- C. To promote the uptake of incentives, schemes, grants and other available funding to improve renewable heat.
- D. To seek ways to incentivise large heat users to adopt renewable heat solutions.
- E. To set green procurement targets for the public sector at a minimum of 20% mandate and ensure all new or replacement heating systems are 100% renewable.

RES 12.2 Promotion of renewable heat technology

It is an objective of Clare County Council:

- A. To encourage the use of renewable heat solutions as part of the design and planning process for new developments and refurbishments.
- B. To support and facilitate the installation of District Heating technologies in new developments .
- C. To facilitate the development of Combined Heat and Power plants for District Heating in industrial zoned areas.
- D. To support the use of renewable heat in residential and commercial developments, such as heat pumps.

RES 12.3 Development and dissemination of geothermal potential

It is an objective of Clare County Council:

To utilise the GSI's shallow geothermal energy resource map and other available data sources, including environmental information, when available to identify the areas most suitable for shallow geothermal installations and to enable better informed decision making and preliminary site suitability assessments.

RES 12.4 Facilitation of ground collection and heat pump energy installations

It is an objective of Clare County Council:

- A. To protect wells, aquifers and other water courses in the development of shallow geothermal resources in accordance with the National River Basin Management for Ireland 2022-2027 and in accordance with the requirements of the Water Framework Directive, the Habitats Directive and Birds Directive.
- B. To promote the use of ground collection heat pump energy technology across County Clare, including schools and other public buildings.

See also Objectives in relation to Bioenergy (Chapter 8) which are relevant to renewable heat.

Chapter 13 Renewable Transport

13.0 Strategic Aims

The strategic aims of this chapter are:

- To focus on the application of renewable transport and its potential contribution to meeting national transport energy targets.
- To assess potential for renewable transport technologies and initiatives in Co. Clare.
- To set out policy and objectives for the uptake of renewable transport technologies.

13.1 Introduction

It is estimated that 122 Ktoe⁷⁶ was consumed by transport in Co. Clare in 2020 which accounts for 39% of total energy consumption. Clare's rural landscape, dispersed population and lack of public transport have led to high levels of private car ownership.

At a County level, this sector is accountable for the greatest increase in emissions in Co. Clare since 1990 with a 143% increase to 2005. In 1990, the transport sector accounted for 20% of total emissions and by 2005, this share had increased to 28%.

By adopting a range of energy efficiency and conservation measures outlined in the National Energy Efficiency Action Plan and policy in 'Smarter Travel – A Sustainable Transport Future: A new Transport Policy for Ireland 2009- 2020', County Clare endeavoured to reduce energy associated with the transport sector by 129 GWh from 2010 to 2020. Co. Clare exceeded this target and made reductions of 179 GWh and aimed for reductions of CO₂ emission by 32,900 tonnes and made reductions of 42,750 tonnes over the same period.⁷⁷

The overall energy related GHG emissions trend for the County follows that of the rest of the country with a decrease in early 2010s and increase again in mid to late 2010s. Similar patterns are noticed in economic activity graphs. Trending to national data, a reduction is expected by 2030.

A combination of energy efficiency measures, electric vehicles and renewable energy sources can significantly reduce the levels of greenhouse gas emissions from the transport sector contributing to achieving renewable transport targets.

13.2 Assessment of Potential

On a national level, the National Renewable Energy Action Plan (NREAP)⁷⁸ specifies a two-pronged strategy that combines increased use of biofuels with the accelerated development and use of electric vehicles (EVs) in Ireland.

The Government has set a target of 950,000 EVs on the road by 2030. For Co. Clare, that's an EV penetration of approximately 26,600 EVs by 2030.⁷⁹ It is an objective of Clare

⁷⁶ Ktoe is a normalised unit of energy, equivalent to the approximate amount of energy that can be extracted from one kilotonne of crude oil. | [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Tonnes_of_oil_equivalent_\(toe\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Tonnes_of_oil_equivalent_(toe)) [Accessed 29/11/2021]

⁷⁷ Clare Energy Emissions Balance, Clare County Council (2021)

⁷⁸ National Renewable Energy Action Plan Ireland, DoECC (2018) [Accessed 07/06/2021]

⁷⁹ Releases and Publications, CSO (2016) | <https://www.cso.ie/en/releasesandpublications/ep/p-tranom/to2016/vlr/> [Accessed 07/06/2021]

County Council to make EV charging accessible and as easy as filling a conventional fuel tank, so that EVs can travel without obstacle across the county. Unlike with conventional vehicles, most EV charging is done at home or at work, so public charging points are needed to serve drivers without access to private charging, and those travelling longer distances. Moreover, a recent analysis has shown that charging will probably shift towards public options, and away from the home as more people without access to home charging start to buy EVs.⁸⁰

ESB is responsible for the rollout of EV charging points across the county. The e-cars Charge Point Map⁸¹ shows the locations of these charging points. Of a total of 1,100 public, standard, and fast charging points in the country, 24 charging points are currently located in Co. Clare as set out in Table 13.1 below.

Table 13.1 EV Charge Points in Clare

Location	Type	Details
Kilimer Car Ferry Car Park, N67, Kilimer, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
Purecamping, L2006, Querrin, Kilkee, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
Tesco Kilrush, Ennis Rd, Kilrush Co. Clare	Type 2, AC43, 22kW	ESB TEV043 2 charging points
Supervalu Car Park, Ennis Road, Miltown Malbay, Co. Clare,	Type 2, AC43, 22kW	ESB C8FG6 2 charging points
Armada Hotel, Coast Road (R482), Spanish Point, Miltown Malbay, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
StoneCutters Kitchen, Cliffs of Moher Road, Luogh North, Doolin, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
Doolin Camping and Caravan Park, Fisher Street/Doolin Pier, Doolin, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
Doolin Hotel, Fitz's Cross, Doolin, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
Kilshanny House, Kilshanny Village (N67), Kilshanny Village, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
The Boghill Centre, Ballygoonaun Road, Kilfenora, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
Hydro Hotel, Main Street, Lisdoonvarna, Co. Clare, Ireland	Type 2, AC43, 22kW eVolve Smart T	ESB C8M80 2 charging points

⁸⁰ Infrastructure for charging electric vehicles, European Court of Auditors (2021) | https://www.eca.europa.eu/Lists/ECADocuments/SR21_05/SR_Electrical_charging_infrastructure_EN.pdf [Accessed 07/06/2021]

⁸¹ Charge point map, ESB (2021) | <https://www.esb.ie/ecars/charge-point-map> [Accessed 07/06/2021]

Location	Type	Details
Public Car Park, Off Abbey Street & Bank Place, Ennis, Co. Clare	Type 2, 22kW eVolve Smart T	ESB C8GA3 2 charging points
Circle K Ennis, Limerick Road, Ennis, Co. Clare	1. AC43 43kW 2. Combo CCS 50kW 3. Chademo 50kW	ESB C5H5J 3 charging points
Vanderlust, Unit 62 Doora Industrial Estate, Quin Road (R469), Ennis, Co. Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
Hotel Woodstock, Shanaway Road, Ennis, Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
Old Ground Hotel, O'Connell Street, Ennis, Clare	Type 2, AC43, 3.7kW	Not part of ESB network 1 charging point
The Green, Sixmilebridge, Clare	Type 2, 22kW eVolve Smart T	ESB C6GKN 2 charging points
Tullyvarraga, Shannon, Co. Clare	Type 2, 22kW eVolve Smart T	ESB C87YX 2 charging points
Ennis Road, Newmarket-on-Fergus, Co. Clare	Type 2, 22kW eVolve Smart T	ESB C8DTH 2 charging points
Circle K Service Station, Airport Road, Tullyvaragh, Shannon, Clare	1. AC43 43kW 2. Combo CCS 50kW 3. Chademo 50kW	ESB C57PL 3 charging points
Oak Wood Arms Hotel, Airport Road, Shannon, Co. Clare	Type 2, 3.7kW	Not part of ESB network 1 charging point

The national Biofuel Obligation Scheme 2010 obliges all road transport fuel suppliers to use biofuel in the fuel mix. The progressive increases in the obligation rate, currently set at 8.695%, with 11% proposed for 1 January 2020, has led to increased use of biofuels.⁸² The scheme is considered the primary policy measure used to increase the share of renewables in the transport sector.

Ireland plans to stop the purchase of diesel buses by Bus Éireann after 2019, with an EU-wide ban on the sale of new diesel and petrol-engine vehicles coming into effect from 2035. Electric vehicles (EVs) offer a solution to cars but electrification is not seen as viable for haulage and coaches. The recast Renewable Energy Directive (2018/2001/EU) has capped the production of first-generation biofuels (from food crops) at 3.8% of energy in transport by 2030 and set a target of 6.8% for low-carbon-transport fuels (excluding biofuels sourced from food crops). Biomethane from anaerobic digestion can contribute to this 6.8% target and has significant potential to reduce the carbon intensity of haulage and bus fleets through the use of existing natural gas vehicles (NGVs); this technology is proven and commercially available. However, there are currently no incentives for the use of biomethane as a fuel for NGVs. Biomethane is recommended for use in thermal and transport energy.

⁸² Biofuels Obligation Scheme, Gov.ie (2020) | <https://assets.gov.ie/27459/6b584c067783491d972c57c2b08bd63b.pdf> [Accessed 07/06/2021]

Compressed Natural Gas (CNG) is an initiative that is particularly suitable for use in commercial vehicles. It is a proven alternative to diesel or petrol and reduces costs and carbon emissions. The first publicly accessible Compressed Natural Gas (CNG) opened at a facility at Dublin Port. This is the first in a network of 150 filling station to be developed in Ireland. Figure 13.1 maps the CNG refuelling stations and renewable Central Grid Injection facilities in Ireland. There is currently one private CNG refuelling station in Co. Clare, based in Shannon.



Figure 13.1 CNG Refuelling Stations and CNG injection facilities in Ireland⁸³

Source: Gas Networks Ireland

13.2 Policy

The Climate Action Plan 2023 commits to a target of 940,000 electric vehicles on Irish roads by 2030. Ensuring there is the necessary infrastructure in place to support this step up is crucial.

⁸³ CNG Refuelling Stations, GNI | <https://www.gasnetworks.ie/business/natural-gas-in-transport/cng-refuelling-stations/> [Accessed 05/05/2021]

The SEAI⁸⁴ offers a number of benefits for EV customers, including a government incentive of up to €5,000 grant per vehicle and up to €5,000 Vehicle Registration Tax relief, €120 motor tax band for electric vehicles and a government grant of up to €600 towards home charging point. EVs are entitled to a 50% saving on motorway tolls.

The government has also published the National Policy Framework on Alternative Fuels Infrastructure for Transport 2017-2030 which is noted to have undergone SEA and AA. This document will guide implementation of a range of approaches to reduce reliance on fossil fuels and increase renewable fuel share.

In order to achieve the savings in energy and CO₂, all economic and social sectors of the County must play their part. Actions to achieve the reductions will include:

- Use of inter-city public transport services, routes and infrastructure.
- Use of rural / urban accessible transport services, routes and infrastructure.
- Promotion of active living and walking friendly environments.
- Prioritisation of walking and cycling as the preferred mode of transport in built up areas.
- Promotion and development of cycling lanes and associated services through proposals for their provision as set out in Local Area Plans , Development Plans, and through the preparation of green infrastructure and sustainable urban mobility plans.
- Development of information / awareness systems to coordinate the optimal use of public service resources; e.g. linking of rural, urban and intercity route planning.
- Development of urban parking strategies to minimise congestion, whilst enabling the provision of retail and commercial services.
- Promotion of 'Park and Ride' services near major transport infrastructure centres to facilitate the increased use of public transport.
- Development of distribution and storage infrastructure to facilitate the use of vehicles powered by LPG, CNG, hydrogen and electricity.
- The promotion and facilitation of vehicle use public awareness and optimisation services such as:-
 - Mobility planning for organisations and communities.
 - Use of shared transport assets (carpooling, car sharing).
 - Increased use of cycling to work / school.
- Promotion of energy efficient driver training.

84 Electric vehicle grants, SEAI (2017) | <https://www.seai.ie/grants/electric-vehicle-grants/grant-amounts/> [Accessed 07/06/2021]

13.3 Objectives

RES 13.1 Renewable transport targets

It is an objective of Clare County Council:

To maximise renewable transport in the County in order to make a proportional contribution to meeting, or exceeding, national targets for renewable transport of 13.4% by 2030.

RES 13.2 Accelerate electrification of private car fleet

It is an objective of Clare County Council:

- A. To support the deployment of publicly accessible charging infrastructure the county.
- B. To encourage consumer change among households.
- C. To implement measures to improve EV charging in private developments, surpassing the minimum requirements of Part L of the Building Regulations where feasible.

RES 13.3 Accelerate transition of commercial fleets to low carbon fuels

It is an objective of Clare County Council:

- A. To accelerate transition of commercial fleets to low carbon fuels.
- B. To support measures for alternative fuels from renewable sources (e.g. AD plants, biomethane, advanced biofuels) and related infrastructure (e.g. refuelling stations).
- C. To demonstrate leadership by transitioning Clare County Council own vehicle fleet to low carbon fuels.

Chapter 14 Waste Resources to Energy

14.0 Strategic Aims

The strategic aims of this chapter are:

- To explain the concept of the 'waste hierarchy'.
- To identify waste streams with potential for conversion to energy.
- To identify factors influencing the preferred locations for the installations of A.D. facilities.
- To set out policy and objectives to ensure anaerobic digestion contributes to the attainment of renewable energy targets for the County.

14.1 Introduction

A natural consequence of any activity is the creation of a quantity of material or energy that may be described as "waste". The concept of waste as a material that has no use or economic value is now being re-evaluated. This outdated concept of waste resources is not in keeping with the existing strategies on waste management or creation of low carbon community and commerce.

The European Commission's European Green Deal (EGD) growth strategy aims for the EU to be climate neutral in 2050. Within the EGD the Commission has adopted a Circular Economy Action Plan for a cleaner and more competitive Europe. The Circular Economy model challenges the old industrial model to rethink the life cycle of products, turning goods at the end of their service life into resources for others through initiatives along the entire life cycle of a product. The **Circular Economy Act**, signed into law in Ireland in July 2022, underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in the economy for as long as possible and that will significantly reduce greenhouse gas emissions.

The European Waste Framework Directive (WFD) (2008/98/EC) establishes the legislative framework for the handling of waste in the community and sets out a requirement for Member States to produce waste management plans. The WFD introduces the waste hierarchy, prioritizing prevention, and management of materials. The waste hierarchy prioritises the prevention and reduction of waste, then its reuse and recycling, then recovery and lastly disposal. Policy documents such as 'National Biodegradable Waste Strategy' (D. o E.H.L.G. 2006) and the 'Bio-energy Action Plan' significantly influence how waste streams are regulated, managed and treated prior to disposal. Finding ways to create renewable energy sources from waste is a good step towards sustainability.

14.2 Waste-to-Energy / Waste as a Resource

The 'National Strategy on Biodegradable Waste' sets out measures to divert biodegradable municipal waste away from landfill. While substantial volumes of biodegradable municipal waste will be diverted from land fill as a result of recycling and biological treatment, significant quantities of residual waste will remain. To maximise the recovery of useful materials and energy from residual waste the national strategy on biodegradable waste identifies thermal treatment with energy recovery as a preferred option.

While this chapter predominantly focuses on Anaerobic digestion (AD) technology as the principle method of converting waste to energy, it is acknowledged that there are potentially other waste streams which could also be harnessed for conversion to energy.

Waste resources are not described in detail in the National Renewable Energy Action Plan itself, however the utilization of treatment methods (principally Anaerobic Digestion) for various biomass waste streams is dealt with in the NREAP under the following:

1. Biodegradable fraction of municipal solid waste including bio-waste and landfill gas;
2. Biodegradable fraction of industrial waste (including paper, cardboard, pallets); and
3. Sewage sludge.

In addition to the waste streams recognized by the NREAP, there are other forms of waste that could be harnessed to provide increased energy efficiency, thermal and or electricity.

- Waste energy streams associated with electricity production;
- Waste energy streams associated with thermal processes; and
- Waste energy streams associated with Solid Municipal Waste.

14.3 Waste Heat Recovery

County Clare has a number of public and private organisations that have high thermal energy loads. The nature of the operations at some of these locations necessitates the release of heat as a “waste” stream. Waste heat is a valuable energy resource that should be identified and wherever possible utilised. The efficient utilisation of waste heat requires a cooperative agreement between the generator of the heat and a local consumer. The form of waste heat may need specialised equipment to capture or transfer the heat to a reusable form.

14.4 Anaerobic Digestion

The efficient utilisation of the various waste or waste energy streams would require the investment in suitable capture, conversion, storage, and distribution infrastructure. An example of the one technology is Anaerobic Digestion.

Anaerobic digestion (AD) uses bacteria to convert organic material such as agricultural, household, and industrial residues and sewage sludge into biogas with high methane content in the absence of oxygen. The methane can be used to produce heat, electricity, a combination of the two or a transport fuel, thereby contributing to renewable energy targets across the three main sectors and ensuring security of energy supply by reducing reliance on fossil fuels and diversifying the national fuel mix.

AD has a number of associated environmental benefits. Energy from AD is effectively carbon neutral. AD also lowers the organic pollution potential of slurries resulting in water quality benefits, the by-products result in better quality fertilizers and reduces the need for artificial fertilizer use. The process also has the advantage of utilising waste substances that are otherwise difficult to dispose of in an environmentally acceptable manner. This management of organic waste contributes towards the achievement of obligations under the EU Landfill Directive.

There are a growing number of AD digesters in operation in Ireland, however the viability of these systems is dependent on access to an adequate and consistent quantity of supply of suitable wastes, which can require large storage areas. Ideally, digesters should be located in close proximity to both a supply source and a demand market.

Gas Networks Ireland (GNI) has a strategic plan to achieve 20% Renewable Gas on the network by 2030⁸⁵. Renewable gas is a carbon-neutral source of energy, with zero emissions. To achieve this target, GNI are currently working to introduce renewable gas to Ireland through the construction of injection facilities along the existing network. The first injection facility in Cush, County Kildare, has the capacity to supply renewable gas to 11,000 homes. There is potential to produce renewable biogas within Co. Clare using on-site or off-site anaerobic digestion (AD) at farms or industrial facilities. Biogas would be purified to natural gas standard at the AD site and collection logistics would be in place to transport the renewable gas to Central Grid Injection (CGI) facilities along the network.

14.5 Landfill gas utilisation

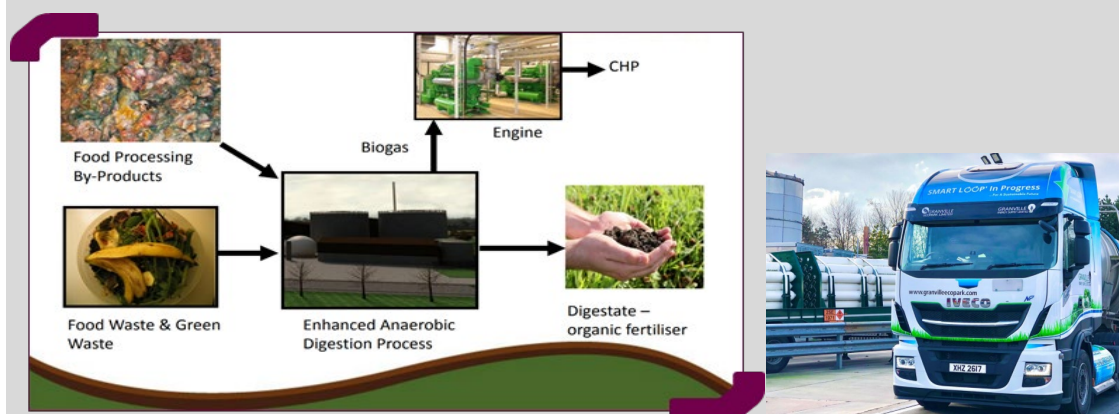
The production of gas from organic matter is not restricted to Anaerobic Digesters. For example, a landfill containing organic matter will produce methane gas naturally. This gas must be processed in accordance with the license issued by the Environmental Protection Agency (EPA). However, it would be preferable if the gas could be used in a more productive manner, by contributing to the County's need for electricity, heat or transport fuel.

14.6 Policy

Clare County Council now forms part of the South Waste Management Region which was established in 2013. The Southern Region Waste Management Plan 2015 - 2021 sets out preferred waste management and waste treatment options for the region. Technologies which enable thermal treatment with energy recovery present opportunities to meet minimum pre-treatment obligations and derive energy from renewable sources thus ensuring that waste to energy projects are compatible with national waste policy.

Case study – Granville Eco Park

Granville Eco-Park has positioned itself at the centre of the Waste Management industry in Co. Tyrone. The plant collects up to 300 tonnes of food waste per day. This waste is treated and put through an Anaerobic Digestion (AD) process, producing a gas and digestate. The gas is partially used on site in a CHP facility and treated to be sold as biogas to nearby Industrial CHP customers. However vehicle fuel has been a new addition to the park.



In early 2021, the Eco-Park introduced two new compressed natural gas (CNG) powered trucks, completing the 'Circular Economy'. Dubbed the 'Smart Loop Lorries', these trucks

⁸⁵ Gas Networks Ireland (GNI) | <https://www.gasnetworks.ie/corporate/company/our-commitment/environment/renewable-gas/>

are used to collect the food waste, which in turn is converted into their fuel, along with the other uses mentioned above.

The relative reduction of CO₂ emissions from diesel to biomethane can reach 95%, and similarly 70% for NO_x emissions. This 'green switch' intends to help the burden of transport transition to clean fuels. Biomethane is compatible with CNG vehicles and up to 50% cheaper than fuel.

The site produces 26million m³ of gas per year, with nearly half used on site in a CHP plant. This is equivalent to roughly filling 1-2 CNG buses per hour. A commercial vehicle requires roughly 90kg to travel 1,000km (0.7m³). The plant can also convert 1 tonne of Food Waste to 500kWh of electricity with the facility exporting approximately 5MW of power to the grid.

14.7 Objectives

RES 14.1 Make a proportional contribution to national targets.

It is an objective of Clare County Council:

To maximise waste-to-energy use in the County in order to make a proportional contribution to meeting, or exceeding, national targets for renewable heat and transport of 24% and 10% respectively by 2030.

RES 14.2 Facilitating the development of Anaerobic Digestion facilities

It is an objective of Clare County Council:

To support and encourage the development of AD facilities:

- A. Where practical, adjacent to the national or regional road network and where traffic considerations are acceptable and the road network has adequate carrying capacity and in compliance with the provisions of the National Development Plan. A traffic management plan may be required.
- B. In a central location within the waste stream catchment area in order to minimise road hauls.
- C. Where there are no unacceptable effects on the amenities of existing residents.
- D. Proximate to electricity grid or gas network or large heat demand user.

RES 14.3 Small scale Anaerobic Digestion

It is an objective of Clare County Council:

To support and encourage in rural areas, proposals for small scale AD close to the source material and where roads have the capacity to carry increased traffic movements. Such facilities shall, where possible, be located within or adjacent to existing agricultural buildings, and in accordance with proper planning and sustainable development.

RES 14.4 AD and wastewater treatment

It is an objective of the Renewable Energy Strategy:

To investigate the feasibility of installing A.D. facilities at municipal wastewater treatment plants in the County. In addition to a feasibility study, an environmental appraisal of all potential impacts will be required for compliance with proper planning.

RES 14.5 Waste Energy Resource Utilisation

It is an objective of the Renewable Energy Strategy:

To investigate and identify any significant waste energy streams and to determine the feasibility of utilising such waste energy streams locally to increase energy efficiency in the County.

RES 14.6 Energy From Municipal Solid Waste

It is an objective of Clare County Council:

To support the Southern Region Waste Management Authority and the policies and objectives contained in any future Waste Management Plan and to investigate the feasibility of energy recovery associated with the processing of MSW subject to compliance with environmental legislation.

RES 14.7 Biogas potential

It is an objective of Clare County Council:

To identify opportunities for the production of biogas from various resources including biomass and waste resource streams including land fill gas in accordance with proper planning and sustainable development.

To collaborate over the lifetime of the strategy with Gas Networks Ireland to establish injection points on the existing gas infrastructure pipeline to accommodate biomethane produced from renewable sources in County Clare.

Chapter 15 Energy Storage

15.0 Strategic Aims

- Introduce the role of energy storage / load balancing as a key enabling technology in the transition from a fossil fuel based energy system to one based on renewable production.
- Outline different kinds of energy storage

15.1 Introduction

Heat and power demand vary constantly and must be matched with sufficient generation. While methods of conventional generation using fossil fuels can be scaled to match demand, renewable energy technologies typically have more variable outputs, dependent on the availability of resources. As more renewable energy is introduced to the electricity network, grid stability becomes a challenge. If generation from renewables is low during a period of higher demand, fossil fuel plants must be scaled up to compensate. In contrast, during times of high renewable energy production, there may be insufficient demand to allow for full exploitation of the resource, leading to a wasted opportunity to generate more clean energy.

One solution to the challenges faced due to the variability of renewable energy is energy storage. This involves storing the excess energy produced during times of low demand to be used at a later stage when demand is higher. The electrical energy is typically converted to a more easily and economically stored form, such as potential or thermal energy, and converted back to electrical energy as required. Emphasis is being placed on the development of energy storage technologies, with some viable options available.

Ireland has set a target to reach 80% renewable electricity on the national grid by 2030. This will create a demand for more interconnection with other countries and more energy storage solutions, because we will have excess renewable electricity available for much of the time. Developing energy storage in Co. Clare would allow the county to maximise the potential of its natural resources.

15.2 The Technologies

Types of electricity storage are categorised as mechanical, electromagnetic, and electrochemical.

- Mechanical - pumped hydro, compressed air and flywheel
- Electromagnetic - super capacitors, super conducting magnets
- Electro chemical - batteries, flow batteries, and hydrogen and fuel cell technology

Pumped Hydro Energy Storage (PHES)

PHES is the most mature and largest storage technique available. A pumped hydroelectric energy scheme is a mechanical device for storing energy. It consists of two large reservoirs located at different elevations, typically between 200-300m and a number of pump/turbine units. Turlough Hill in County Wicklow is an example of a PHES system.

The installation of PHES is dependent on specific geological formations. However, as well as being rare, these geological formations normally exist in remote locations that can be environmentally and ecologically sensitive and where construction may be difficult and

costly and where the power grid may not be present. In the previous RES, one indicative site area is identified as having potential to accommodate PHES. This is located in West Clare (Slieve Callan area).

Battery Storage

Battery Energy storage can be integrated with renewable energy generation systems in either grid connected or standalone applications. For grid connected systems, batteries add value to intermittent renewable sources by facilitating a better match between supply and demand. Other benefits of this method of energy storage include; power quality assurance, load levelling and integration of renewable energy generation plants. There are no emissions, solid wastes or effluent produced from these battery storage systems. There are a number of different types of battery technologies.

There are no installed energy storage facilities in the county, however there are three permitted battery storage facilities and two permitted renewable energy developments that include battery storage that will help balance the energy supply for the benefit of the local region and economy. **Table 15.1** outlines planned battery storage developments in Clare, and these are indicated on **Map 16.2**.

Table 15.1 Permitted Battery Storage Facilities in Co. Clare

Name	Status
Solar development including storage at Firgrove, Sixmilebridge	Permitted
Substation and battery storage at Knockalassa, Miltown Malbay	Permitted
Battery storage facility at Moneypoint	Permitted
Solar development including storage at Clonloghan, Caherteige	Permitted
Battery storage at Glenmore Kilmihil	Permitted
Biomass Processing and Battery Storage at Stonehall Newmarket on Fergus	Further information requested

In general battery storage can provide short time support and stability for the electricity grid (up to a number of hours at most) and will not on their own provide adequate grid resilience.

There are no current models for assessing energy storage requirements in the form of battery facilities or green hydrogen facilities. Speculative projects are emerging across the country.

Thermal Storage

Thermal energy storage comprises a number of technologies that store thermal energy in energy storage reservoirs for later use. They can be employed to balance energy demand between day and night time. The thermal reservoir may be maintained at temperatures hotter or colder than the ambient environment. Its applications include the production of hot water, which is used to cool or heat buildings.

Hydrogen Energy Storage

Converting renewable electricity to hydrogen using electrolyzers is known as 'green hydrogen' generation. This is seen as having major potential in Ireland as a means to store excess renewable energy. Hydrogen can be used in many ways, for example as a fuel in electricity generation plants (putting green energy back on the grid when wind and solar are not strong), as a fuel in transport, or as a means to decarbonise the natural gas grid (by blending of hydrogen with methane, or by having a hydrogen-only gas grid). There is also potential for green hydrogen to be used in industry as a low-carbon alternative to fossil fuels.

Given the existing renewable electricity generating capacity in Clare, and the concentration of power plants and strong electricity and gas grids, it may be an attractive area for developing hydrogen conversion facilities. ESB's proposed offshore energy project at Moneypoint includes large scale hydrogen generation, storage and export.

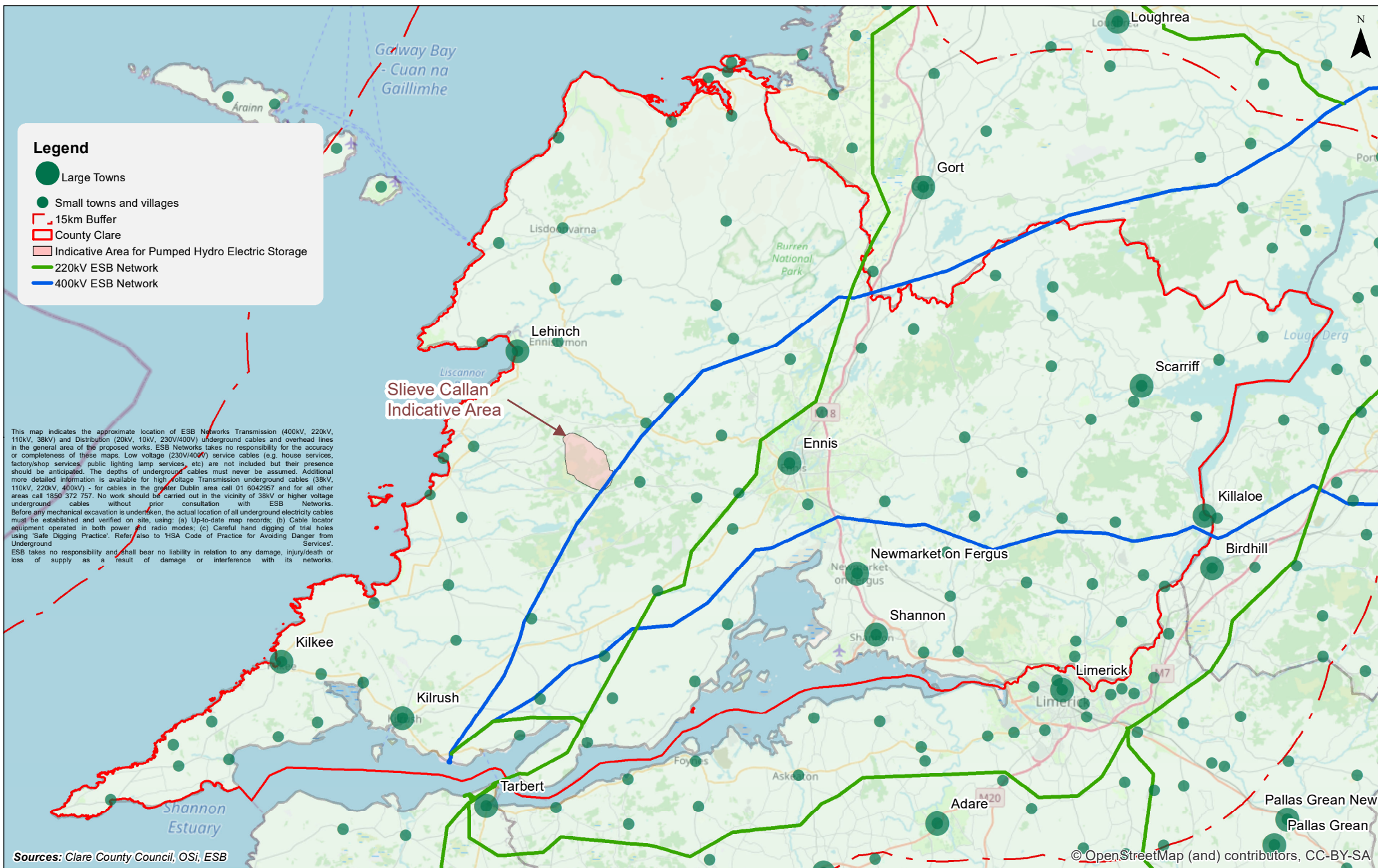
15.3 Assessment of Potential

The requirement for storage systems on the electricity grid is growing, but the overall requirements, type of storage and its ideal location is not yet mapped out. This is because Ireland's national grid is breaking new boundaries in terms of renewable energy penetration. Eirgrid is currently developing a five year strategy to enable the government target of 80% renewable electricity by 2030 to be delivered. The outcome of this will determine the roadmap for grid development including energy storage needs.

In 2010, the Limerick Clare Energy Agency commissioned a report entitled 'The Potential for Fresh Water Pumped Hydroelectric Storage in County Clare'. This report identified and quantified the characteristics of potential sites for pumped hydroelectric storage utilising fresh water resources that may support the development of renewable electricity generation in the County.

Following a detailed study of the geographical and physical potential for PHES and through the SEA and AA processes, the first Clare RES identified one indicative area, considered to have significant potential to accommodate future pumped freshwater hydroelectric energy storage. This area is outlined on Map 15.1 at West Clare (Slieve Callan area). Map 15.1 shows the indicative area in the context of the location of grid infrastructure in the County. The remainder of the County is classified as not normally permissible for PHES.

PHES has not advanced in Ireland in the past decade. The potential still remains for this technology to be deployed in Clare. More detail is available in the RES 2017-2023.



15.4 Objectives

RES 15.1 Facilitating energy storage systems

It is an objective of Clare County Council:

To facilitate, where possible, forms of Energy Storage, including pump hydro electric, battery and thermal energy storage and other forms of innovative energy storage that improves overall electricity grid resilience and stability. This includes facilities for green hydrogen production and storage.

RES 15.2 PHES Proposals

It is an objective of Clare County Council:

Within the Indicative Area identified on Map 15.1, to facilitate the development of Pumped Freshwater Hydroelectric Energy Storage, subject to satisfactory environmental protection.

RES 15.3 Sustainability of energy storage proposals

It is an objective of Clare County Council:

To examine at planning application stage how energy storage systems such as batteries will be safely managed and recycled at the end of life phase, to ensure that a circular economy approach to design and resource efficiency is followed.

Chapter 16 Supporting Infrastructure

16.0 Strategic Aims

The strategic aims of this chapter are:

- To ensure that Co. Clare has a robust and efficient infrastructure which not only meets the County's existing and future energy needs, but also enables it to be an exporter of energy.

16.1 Introduction

The availability of supporting infrastructure can facilitate or constrain renewable energy developments. The type, scale and location of installations will depend on the proximity to the required infrastructure and the available capacity. Key supports include the national electricity grid, gas infrastructure, water supply and wastewater facilities, transport, and energy storage. Where necessary, infrastructure may need to be upgraded or constructed, however, this increases the complexity, cost, and duration of projects.

There is existing infrastructure in Clare that presents opportunities for future renewable energy developments, shown in Map 16.1 and Map 16.2.

16.2 National Electricity Grid

The National Grid is a nationwide electricity transmission network that consists of both overhead and underground high voltage power cables. County Clare is exceptionally well served by the grid with two existing 400kV lines providing a high capacity path for power flows from Moneypoint to the east of Ireland. In addition, there is an extensive 220kV and 110kV network.

The transmission network is undergoing a transformation to account for the integration of renewable energy and the implementation of technological innovation. This requires necessary infrastructure and operation requirements to facilitate the shift to a more sustainable energy future across the island of Ireland. The introduction of variable renewable forms of generation on the network adds complex demand and supply issues, these include⁸⁶:

- The operational challenges of more variable, non-synchronous generation sources;
- Security of supply in managing increasing number of generation technology types; and
- Integration and use of Smart Grid technologies .

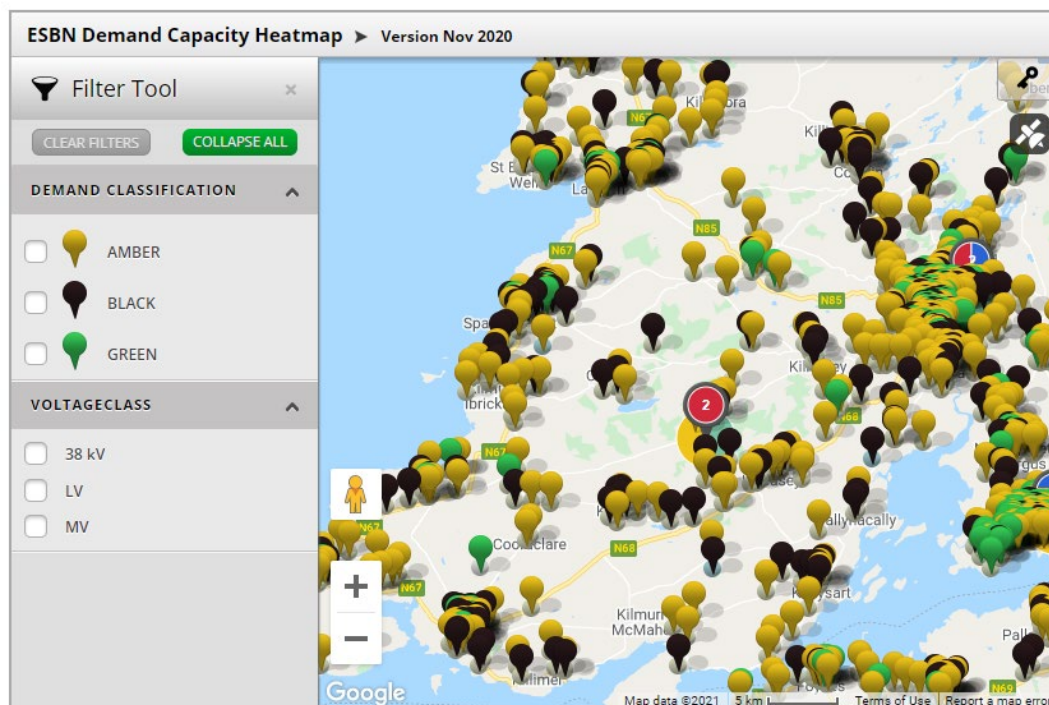
The distribution system is operated by ESB Networks and operates with low voltage, 10 kV, 20 kV, 38 kV and 110 kV lines. The Available Capacity Heatmap developed by ESB (available online) contains capacity information on all of the 3-phase Low Voltage (LV), Medium Voltage (MV) and High Voltage (HV) Distribution System Operators (DSO) substations. This information is indicative and does not preclude development where it indicates network capacity.

The image below provides a snapshot of substation capacities on the ESB Networks website at the time of writing. The heatmap resource can be used by those examining grid capacity

⁸⁶ <https://www.eirgridgroup.com/how-the-grid-works/renewables/>

for renewable energy generation in a particular part of the county. The map shows that areas along the coast may require grid reinforcements or upgrades to accommodate renewable energy projects at these locations.

Figure 16.1 ESBN Demand Capacity Heatmap Co. Clare



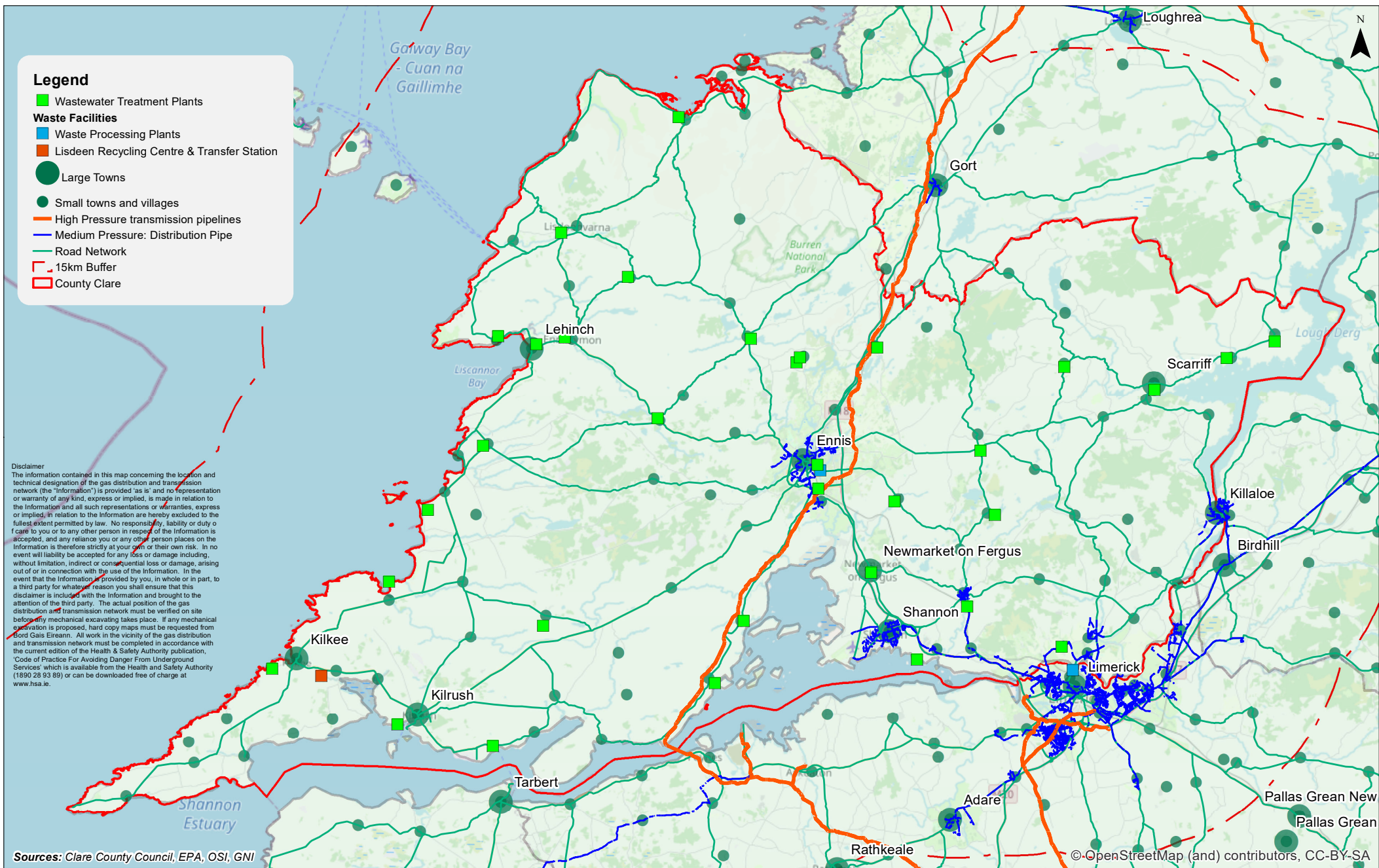
ESB Network Capacity Map (Demand) Legend: BLACK:- Between 0 and 20kVA, AMBER:- Between 20 and 200kVA, GREEN:- Greater than 200kVA

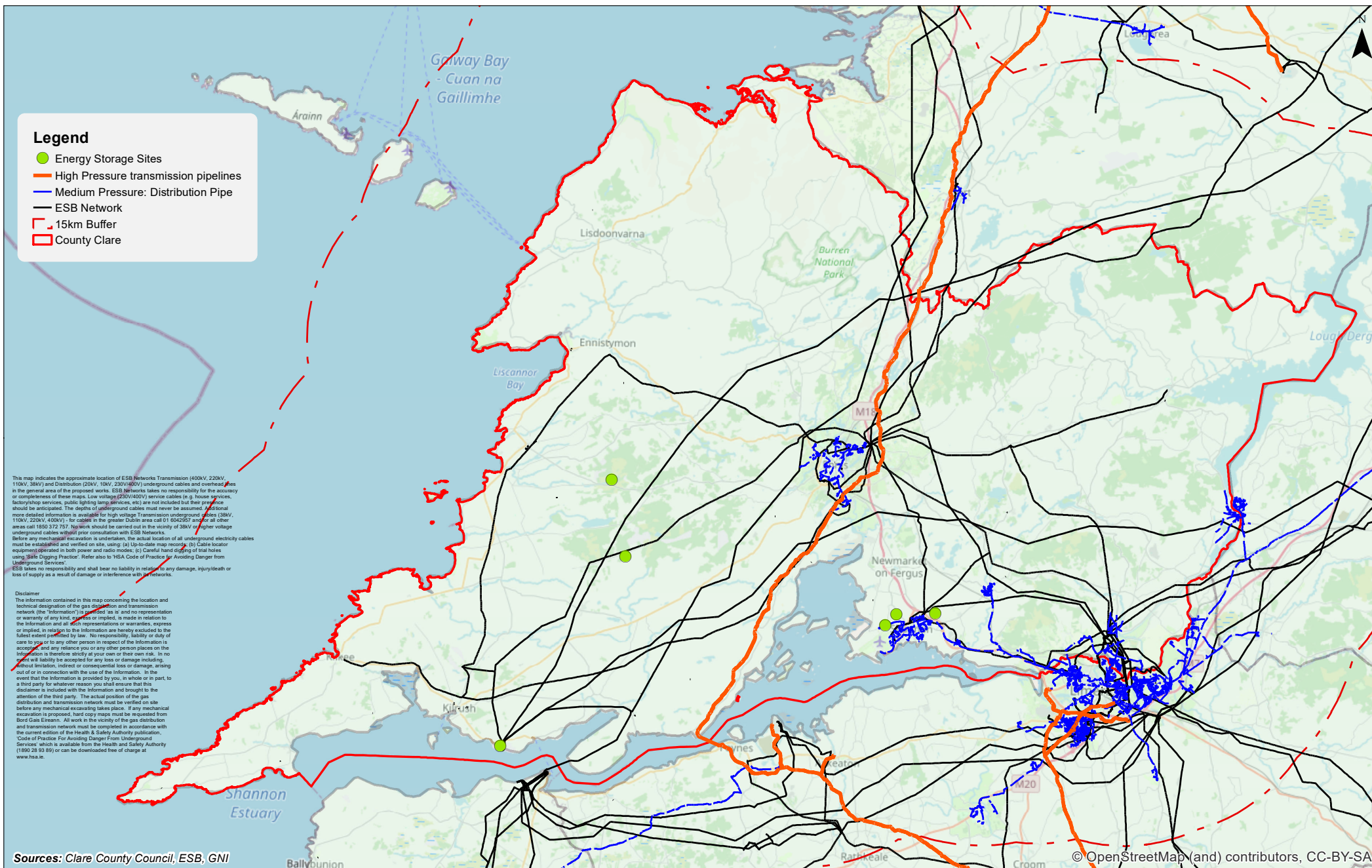
16.2.1 Grid Connection

Grid connection policy can have a wide ranging impact on the electricity system, from determining the level of competition in wholesale markets, facilitating the delivery of renewable energy targets and enabling the connection of new technologies to provide a system service.⁸⁷ These factors directly impact the consumers in terms of price and service. The Commission for Regulation of Utilities (CRU) introduced a new grid connection policy – the Enduring Connection Policy – Stage 2 (ECP-2) in 2020.

Under ECP-2, a maximum of fifteen connections offers per year will be allocated to community-led renewable energy project. It is open to all generating, storage and other system service technologies. Details on community-led projects are provided in Chapter 18.

⁸⁷ Electricity Connection Policy, CRU (2020) | <https://www.cru.ie/wp-content/uploads/2020/06/CRU20060-ECP-2-Decision.pdf> [Accessed 06/06/2021]





16.2.2 Smart Grid

The development of a Smart Grid is an important part of County Clare's ability to maximise energy efficiency and the integration of renewable energy. Elements of the Smart Grid will include:

- Voltage / power management of grid network;
- "Self-healing" correcting grid using sensing and controls allowing for real-time troubleshooting;
- Integration of renewable energies at all scales;
- Integration of electric transport systems;
- Smart metering for all sectors;
- Sophisticated tariffs; and
- Demand side management

County Clare homes have participated in the pilot roll out of 'smart meters'. The new Microgeneration Support Scheme (MSS) is being designed to enable individuals, farmers, businesses and community groups to sell renewable electricity into the grid. The scheme design seeks to establish the 'renewables self-consumer' model of energy generation and consumption in Ireland to achieve 2030 targets for renewable energy.⁸⁸ The roll out of Smart meters to all electricity customers by ESB Networks, and several other elements of the Smart Grid are underway to help achieve these goals.

16.3 Energy Storage

Energy storage is explored further in Chapter 15.

16.4 Gas

Gas Networks Ireland (GNI) owns and operates the gas transmission pipeline running from north to south through County Clare. GNI also applies a 400m 'zone of interest' corridor to the gas pipeline whereby the nature and scale of all developments outside the way leave are monitored to ensure compliance with the current code of practice.

The natural gas network in Ireland provides much of the country with a cleaner, more sustainable alternative to coal, peat and oil for heat and power. Natural gas can assist in the connection of variable renewable generation to the grid, acting as a back-up fuel.

The gas network is being transformed to accommodate renewable gas, in the form of biomethane. In this way, the carbon intensity of gas will reduce and it can continue to play a role in the decarbonised energy systems of the future. Blending of hydrogen gas is another way to make the natural gas network more sustainable in the future. The presence of high renewable electricity potential in the region (onshore, and in the future offshore) make Clare an attractive location at which to couple the electricity and gas grids using hydrogen.

16.5 Ports / Harbours / Piers

Development of marine renewables and the associated servicing greatly depend on the capacity of port infrastructure. Clare County Council recognises that the maintenance, improvement and, in some cases, construction of new piers and harbours is essential in coastal and estuarine areas in order to provide the necessary infrastructure to maximise

⁸⁸ Microgeneration Support Scheme, DOECC (2021) | <https://www.gov.ie/en/press-release/03c6e-citizens-farmers-business-owners-and-community-organisations-will-be-able-to-sell-electricity-into-the-grid-under-new-scheme-being-developed-by-climate-minister/> [Accessed 08/06/2021]

the potential of marine renewable energy. Clare County Council will encourage the development of new harbour facilities along the Shannon Estuary in order to take advantage of the deep water conditions in the area. Relevant objectives are set out in Chapters 8 and 11 of Vol. 1 of the Clare County Development Plan 2023 -2029. The importance of this infrastructure to the development and servicing of the offshore marine renewable sector is highlighted in the 'Strategic Integrated Framework Plan for the Shannon Estuary'. Sections 4.6.3 'Energy Strategy for Shannon Estuary' in Volume 9 of the Clare County Development Plan 2023-2029, Section 4.6.4.4. 'Servicing of Offshore Renewable Energy' and Section 4.6.4.5 'Research and Development'.

Lands at and adjacent to Moneypoint are identified as having potential for marine related industry and renewable energy.

Information on marine renewables are contained in Chapter 9 of this strategy, including a focus on new proposals by ESB for its assets at Moneypoint.

16.6 Transport

Transport infrastructure is an important consideration for the development of renewable energy technologies. Access roads capable of accommodating heavy duty vehicles are required for the construction, operation, and decommissioning phases of developments.

The Clare County Development Plan 2023-2029 identifies the M18 route that traverses through County Clare as a strategic opportunity for the County.

Transport investment in the region aims to expand attractive public transport and other alternatives to car transport. A shift away from private car to greater use of active travel (walking and cycling) and public transport (e.g. bus)⁸⁹. The rest of the county is served by local and regional buses and private bus companies. Co. Clare would benefit from encouraging sustainable transport, including walking, cycling, emerging e-modes and public transport to accommodate the necessary switch from the private car.

Renwable Transport energy is explored further in Chapter 13 of this strategy.

16.7 Water supply and wastewater

The provision of good quality water supply and effective wastewater treatment and disposal infrastructure are critical requirements for the economic development of the County and in particular for attracting inward investment in green/ clean technology. Some renewable energy technologies are particularly dependent on having continuous water supply such as hydro power. The abstraction of water from rivers and lakes can reduce the ability of an ecosystem to continue functioning. The Council will seek to ensure that water serving the renewable energy industry is protected from pollution and managed in a sustainable manner. Relevant objectives are set out under Chapter 8, Volume 1 of the Clare County Development Plan 2023-2029.

⁸⁹ Sustainable-Transport-on-National-Road, TII (2020) | <https://www.tii.ie/> [Accessed: 05/04/2021]

16.8 Objectives

RES 16.1 Renewable Energy and Supporting Infrastructure

It is an objective of Clare County Council:

- A. To collaborate with EirGrid over the lifetime of the Strategy to ensure that County Clare has the grid infrastructure in place to maximise its potential for renewable energy generation to meet its own energy needs and to enable export to the demand market.
- B. To promote and as far as practicable facilitate Eirgrid and ESB Networks in the development and delivery of a Smart Grid with its constituent elements.
- C. To support and facilitate the emergence of a competitive supply chain economy that will sustain and assist in further developing a robust renewable energy sector in County Clare.
- D. To request medium and large scale heat / energy users to utilise waste heat and power to meet on site energy requirements and to supply or utilise future district heating networks.
- E. To request that the expansion or upgrading of existing infrastructure, including roads, ports, piers, power lines and substations etc. to support the development of renewable energy projects.
- F. To ensure that the County's ICT and broadband network enables it to be a leader in renewable energy research and development.
- G. To require planning applications for multi unit housing developments, large commercial and industrial developments to be accompanied by a feasibility study setting out the potential for incorporating district heating infrastructure into the proposed development.

Chapter 17 Environmental Considerations & Development Management Advice

17.0 Strategic Aims

- To address the key success and failure factors of Renewable Energy projects
- To briefly outline development management advice for RE developments to secure planning permission having regard to the Planning Acts and Regulations.
- To guide the development of renewable energy so that it protects and enhances the environment of County Clare in so far as possible.

17.1 Introduction

This section of the RES sets out the environmental considerations and development management advice as it relates to renewable energy technology in Co. Clare.

17.1.1 Key success factors of Renewable Energy projects

The merits of having a plan led strategy to guide the location and provision of renewable energy projects is evident when the key success and failure factors are examined. A plan led strategy provides greater certainty and clarity to developers and the public. It affords opportunities for public consultation, which engenders a greater sense of ownership of the final adopted strategy. An assessment of the reason for success or failure of renewable energy projects was carried out and reveals the following:

Successful renewable energy projects are generally characterised by:

- Compliance with Development Plan policy and strategies;
- Compliance with regional and national guidelines;
- Engagement in preplanning;
- Early consultation with prescribed bodies;
- Continuous and meaningful community consultation;
- Minimising environmental, traffic, or visual impact;
- Implementation of proposed mitigation measures;
- Broad community support;
- Ease of access to grid;
- Geographical proximity to suppliers/ or end users; and
- Protection of residential amenity.

17.2 Environmental Considerations

It is vital that renewable energy development is sustainable and appropriate for the area. There are a number of key environmental considerations that must be taken into account during all stages of the development.

Biodiversity

The potential impact of proposed renewable energy developments on flora and fauna in the immediate and surrounding area must be assessed to ensure that there are no adverse effects on nature and wildlife. Biodiversity protection is important in all parts of the County, and for all projects. Control and manage alien/ invasive species is another important safeguard to be considered.

Certain designated areas, of heightened ecological importance, deserve further consideration as set out below.

There are 37 Special Areas of Conservation (SACs) in Clare, there are 10 Special Protection Areas (SPAs) in the Clare. Together SACs and SPAs make up the Natura 2000 network across the European Union, incorporating both terrestrial and marine areas. The SACs are conservation areas protecting wildlife habitats and species outlined in the Habitats Directive. The SPAs are designated under the Birds Directive and protect migratory birds and threatened species.

In Ireland, the national designation for wildlife is the Natural Heritage Area (NHA). These areas are important for habitats present or hold species of plants and animal whose habitats need protection and there are thirteen pNHAs in Co. Clare.

In all cases, the potential impact of proposed developments on these areas must be assessed and mitigation measures put in place where necessary. Where measures cannot be implemented to eliminate or significantly reduce impacts, developments should consider alternative siting. There is a higher concentration of protected areas in the west of the county.

Noise

There is potential for noise impacts during the construction, operation, and decommissioning stages of renewable energy developments. Receptors in the surrounding area, particularly sensitive receptors such as schools and hospitals, should be identified and assessed for their susceptibility to environmental noise. Measures can then be put in place to prevent or reduce noise emissions and their impact on receptors.

Landscape and Visual

Preservation of landscape character and visual amenity need to be considered when planning renewable energy developments, as specified in the Planning and Development Act 2000, as amended. The Landscape Character Assessment for Co. Clare groups and maps the landscapes of the County into four major Landscape Character Areas (LCA), and includes detailed recommendations for their management, protection and conservation.

Throughout the county there are designated Heritage Landscapes and Scenic Routes. It is important for local communities, the wider society and for the tourism industry that the character of the landscape and the views are protected throughout the County. Proposed renewable energy developments should be assessed for their impact on sensitive landscapes and measures put in place to minimise the impact on visual amenities within the county.

Water Resources

Renewable energy projects, particularly where they require significant excavation and construction effort, have the potential to impact on water resources (groundwater, rivers, lakes and estuaries / marine waters). Potential impacts on water quality need to be considered when planning projects.

Built Heritage

Renewable energy developments should avoid adversely impacting the cultural heritage in the county. The architectural and archaeological protected structures, sites and areas within Co. Clare have been identified and mapped. The National Monuments Act established a list of Recorded Monuments and Places (RMP) that are of historical and archaeological significance. These sites are located throughout the county, with higher

concentrations in the larger urban areas. Over 800 structures in Clare are included in the Record of Protected Structures (RPS) in recognition of their special interest for historical, artistic, or other cultural reasons. Buildings constructed after 1700 are included in the National Inventory of Architectural Heritage (NIAH). In all cases, consent must be obtained to carry out works on or near these sites and limitations may apply to the extent of retrofit possible for Protected Structures.

Development proposals within or near designated Architectural Conservation Areas (ACAs) and the Zone of Archaeological Potential surrounding recorded monuments may be constrained. Where necessary, an Archaeological Assessment can be undertaken to determine the type and extent of impacts of a development on protected structures or monuments. The aim is to harness the renewable energy potential of the area while preserving the architectural and archaeological heritage.

Air Quality and Climate

Renewable energy provides a cleaner alternative to conventional generation in terms of reduced impact on air quality and climate. Although the renewable energy generation itself does not typically produce harmful emissions or CO₂, there is potential for such during the operating life cycle of the development. The construction, operation and decommissioning stages must be considered when assessing the impact of the development on air quality and climate, with projects aiming to minimise the release of CO₂. Air emissions from combustion of biomass and other biofuels needs to be carefully considered in the design and assessment of facilities. Control of odour is an important consideration when dealing with organic feedstocks and waste-to-energy. Project aspects such as vehicle emissions, material supply and reuse and disposal of waste offer opportunities for carbon savings to be made.

17.3 Development Management for Renewable Energy Developments

Comprehensive development management advice is included within the Clare County Development Plan 2023-2029 (see Appendix 1 in Volume 1 of the CDP 2023-2029).

For renewable energy development, the following table summarises some of the key requirements when individuals, communities or companies are considering renewable energy development.

Table 17.1 Overview of Development Management Aspects

Aspect	Advice (refer to CDP Appendix 1 for more detail)
Pre-Planning Consultation with Clare County Council	A landowner or developer can seek consultation with the planning authority in advance of making a planning application (Section 247 of the Planning and Development Act 2000, as amended). This is advisable, since it gives an opportunity to discuss procedural aspects, and for the council to advise on what concerns it might have.
Exempt Development	Certain small scale renewable energy installations are exempt from the requirement for planning permission. The exemptions are defined in the Planning and Development Regulations, which are periodically updated to take account of new government priorities and changes in technology.

	<p>The Planning and Development Regulations 2001-2022 contain newly introduced Exempted Development provisions for solar panel installations at existing properties. Within Solar Safeguarding Zones (established in the Planning and Development (Solar Safeguarding Zone) Regulations 2022), the quantum of rooftop-mounted solar panels on non-residential buildings that can be installed as Exempted Development is limited, due to proximity to airports, aerodromes and helipads. The Coonagh safeguarding zone extends into Clare, and the Shannon Airport solar safeguarding zone covers the county's international airport and hinterland. There is potential for glint and glare from solar panels to impact aviation safety.</p>
Environmental Protection (and supporting documentation)	<p>The environmental factors set out in Section 17.2 need to be taken into account, as well as other environmental sensitivities of a particular area.</p> <p>Depending on the scale and location of the energy project, and what it involves, the planning authority may require preparation of specialist reports – for example on ecology, or landscape impacts – to accompany the planning application. The requirements are best teased out at the pre-application phase.</p>
Environmental Impact Assessment	<p>Certain large scale energy projects need to be considered under the EIA process, as defined in EU and Irish legislation.</p>
Habitats Assessment (Natura 2000 sites)	<p>Where a Renewable Energy project has the potential to cause significant effects on a European Site(s), appropriate assessment will be required in line with Article 6(3) of the EU Birds and Habitats Directive.</p>
Strategic Infrastructure Development	<p>Certain large scale renewable energy projects, and some electricity transmission projects or harbour developments, in some cases come into the definition of strategic infrastructure. In this case, the planning application is made directly to An Bord Pleanála, as opposed to Clare County Council. Public consultation and input to the application is provide for, and the Council is an important statutory consultee in the process.</p>
Marine Area Renewable Energy	<p>Once finalised and passed by the Houses of the Oireachtas, the Marine Area Planning Act will create a new system to enable energy projects in the marine area to make a single integrated application for planning consent directly to An Bord Pleanála.</p>

17.4 Implementing Renewable Energy through the Planning Process

Table 17.2 below highlights opportunities in the development management process for boosting the implementation of renewable energy throughout County Clare.

Table 17.2 Bringing renewable energy opportunities to the fore in the planning process

Type of development	How renewable energy will be considered at planning application stage
House Renovations / Upgrades	<p>Maximising energy efficiency (passive design principles, thermal insulation, air-tightness).</p> <p>Encouraging renewable heat solutions (e.g. heat pumps, solar thermal, wood fired stoves)</p> <p>Encouraging solar PV panels</p> <p>Encouraging EV charging facilities to be installed.</p>
New Houses	<p>As above.</p> <p>Development will be designed to meet Part L standards (NZEB) and will be required to incorporate renewable energy</p>
Housing Estates and Apartment Schemes	<p>Development will be designed to meet Part L standards (NZEB) and will be required to incorporate renewable energy.</p> <p>Maximising energy efficiency (passive design principles, thermal insulation, air-tightness).</p> <p>Encouraging district heating solutions with low-carbon heat source.</p> <p>Encouraging renewable heat solutions (e.g. heat pumps, solar thermal).</p> <p>Encouraging solar PV panels.</p> <p>Encouraging EV charging facilities to be installed.</p>
Community Facilities	<p>Maximise building energy efficiency.</p> <p>Encourage consideration of renewable energy solutions as part of the facility design.</p> <p>Explore potential for Sustainable Energy Community approach, or to incorporate a community energy project into the overall project (e.g. solar PV panels, solar thermal heating).</p>
Offices and Mixed Use Development	<p>Developments will be designed to meet Part L standards (NZEB) and will be required to incorporate renewable energy.</p> <p>Encouraging use of solar PV panels on roof spaces to maximise on site renewable energy generation.</p> <p>Encouraging district heating solutions with low-carbon heat source.</p> <p>Encouraging renewable heat solutions (e.g. heat pumps, solar thermal).</p>

	Encouraging EV charging facilities to be installed – consider going beyond minimum requirement of Part L 2017, and future proofing for future EV growth.
Industrial Facilities	<p>As above.</p> <p>Explore ways to capture and use any waste heat sources, for example by means of district heating, or collaboration with other industries or nearby developments.</p> <p>Large scale solar and/ or wind energy installations may be applicable, depending on location, scale and energy load.</p>
Agricultural Buildings	<p>Energy efficiency – for example in lighting systems, and in selecting equipment and machinery – should be implemented.</p> <p>Opportunity to incorporate renewable energy – e.g. solar panels on roof, small scale wind turbines – should be considered.</p> <p>For agricultural residues (e.g. slurries) the potential for Anaerobic Digestion (biogas production) should be considered.</p>

Chapter 18 Community Energy

18.0 Strategic Aims

- To introduce community energy and the 'sustainable energy community' concept
- To outline the benefits of community energy, and potential supports available
- To explore community benefit arising from large scale energy projects

18.1 Introduction

Community energy is a broad term to describe citizen and local ownership and participation in renewable energy generation, distribution and efficiency. This is a growing area in Ireland, as more people become energy aware, motivated to respond to climate change, and seek to engage more with sustainability.

Community renewable energy projects present the opportunity to create a regular income stream which can be used to fund local improvements to enhance and strengthen communities. They can generate wider benefits such as investment in local communities, local job creation and raising local awareness and interest in other types of renewable energy. Additionally, by developing their own renewable energy schemes, communities can have more control over the scale and location of local developments. They will need to establish a legal identity to progress their plans.

18.2 Sustainable Energy Communities

Sustainable energy communities are those which employ an integrated, collaborative effort, with everyone working together to develop a sustainable energy system. This concept is also being promoted and supported through a Sustainable Energy Authority Network Programme. This system will ensure a balance of demand and supply and provide the community with greater energy autonomy. The process involves the establishment of a Sustainable Energy Zone within which an integrated approach to sustainable energy practices will be undertaken. Twenty-four Sustainable Energy Communities have been established in Co. Clare and they are listed below in Table 18.1

Table 18.1 Co. Clare Sustainable Energy Communities

1. Lisdoonvarna Tidy Towns	13. West Clare Municipal District
2. Miltown Malbay Development Company	14. Lisdoonvarna Failte CLG
3. O'Brien's Bridge Community Group	15. Kilmihil People's Park Ltd
4. Kilkee Sustainable Community Group	16. Barefield Community Development
5. Meitheal Finnimh An Clár – Clare Energy Cooperative	17. Kilmihil Community Development Ltd
6. 1st and 4th Ennis Scouts	18. Newmarket-on-Fergus Community Centre CLG
7. Clooney Spencilhill Community Development Group	19. Broadford Community Action Group

8. Burren Ecotourism Network	20. Brothers of Charity Services Ireland Clare Region
9. Clare Local Development Company	21. Banner Housing Association
10. Inagh Development	22. Cratloe Community Council
11. Doolin Community Council	23. Tuamgraney Development Association
12. Ennistymon Town Team	24. Kilfenora SEC

18.3 SEAI Community Energy Supports

The SEAI Better Energy Communities programme helps upgrade building stock and facilities to a high standard. It's goal is to reduce fossil fuel usage, greenhouse gas emissions, and energy costs, and as part of the Governments National Retrofit Programme, it also intends to increase Energy efficiency and renewable energy uptake.

The Grant supports community based and community led energy programmes where new approaches to higher quality improvements and local energy efficiency are encouraged. The designated engagement of communities bring people together. As a result of building under the same programme, greater community-wide improvements are facilitated. The Grant blueprint is to support 'showcase' projects so to come to a point in the future where other local communities have template projects to look, copy, adjust, and implement, without the need of SEAI help. The Communities Energy Grant ambitions include:

- Building on previous scheme success to deliver larger and more technically challenging schemes.
- Support cross-sectoral partnerships to deliver energy savings to a range of building types, including public, commercial, and community buildings.
- Develop the supply side of the government energy retrofit targets.
- Empower businesses, public sector organisations, communities, and local authorities, to lead deep energy efficient upgrades within their community.

SEAI can provide support in forms of financial, technical, and partnership support. Additional support can be provided to Assisted Community Projects (first or second application, or grant value less than €220,000) at any stage, for example advice and project proposal eligibility, training workshops, progress check-ups, payment assistance etc. The overall maximum % funding available for the scheme per project is 50% which includes the Project Management fees.

18.4 Support for Community Energy Project under RESS

The Renewable Energy Support Scheme (RESS) aims to promote the generation of electricity from renewable resources. Under RESS, a specific allocation is made for funding community energy projects. These Community-Led Projects will allow communities to generate their own electricity and sell to the national grid. Community-led projects can apply for RESS if they meet the following criteria under RESS-1 :

- Applications must be made in conjunction with a Sustainable Energy Community (SEC);
- Project size must be between 0.5 and 5MW;

- Majority ownership (51%) - primary purpose is community benefit (environmental, economic or social) rather than financial profit. The other 49% can be motivated by profit;
- The Declaration of Community-Led Project must identify the SEC and the relationship between the Applicant and the SEC;
- Community group must be based on open and voluntary participation
- Participation is based on local domicile

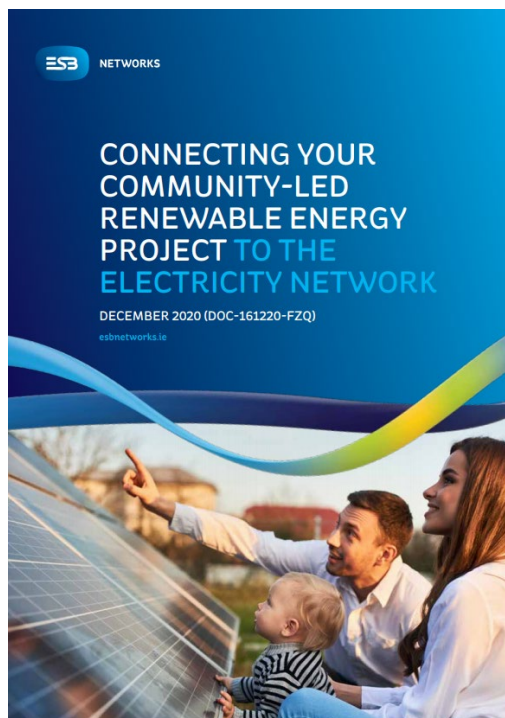
The Climate Action Plan 2023 has increased the ambition for the number of community owned renewable energy projects to at least 500MW by 2030.

Under RESS-2 guidance, it was stipulated that all projects participating in the community led sector must be 100% community owned rather than the 51% majority ownership under RESS-1.

The Climate Action Plan 2023 also outlines a target of 1,500 sustainable energy communities to be established by 2030 and this momentum will see a greater number of SEC's within county clare delivering local renewable energy projects.

As part of the first RESS 1 auction, a community-led solar project was successful in Co. Clare. This is the proposed Lisduff Solar park, a 4 MW capacity project. RESS-2 auction results will be announced in mid 2022.

However, it should be noted that community ownership does not guarantee that objections will be eliminated, particularly from residents who are not part of the schemes, or from competitive schemes.



ESB Networks has produced guidance on the grid connection process.

18.5 Large scale energy projects - Community Benefit funds

Renewable energy developments can produce significant environmental, economic and social benefits. They also produce impacts, particularly on the local communities within which they are located. The benefits of renewable energy developments tend not to be concentrated in the area around the development, for example, the benefits of reduced carbon emissions are global.

There are a number of different models for the sharing of the rewards from renewable energy projects with communities in the vicinity of the developments. These include:

- Benefit in kind - where the developer directly provides or pays for improvements to local community facilities, environmental improvements, sports, social, educational or recreational facilities etc,
- Community funds - occurs where the developer pays a lump sum or regular payments into a fund for the benefit of the local community,
- Local contracting - occurs where there is associated local employment during construction and operation,
- Local ownership - of shares in the project by local people, either through their own investment, profit sharing or part ownership designed to tie community benefit directly to the project performance.

A mandatory Community Benefit Fund must be provided by all projects successful in a RESS auction. The contribution is to be set at €2/MWh. The Fund will be aligned to incentivise investment in local renewable energy, energy efficiency measures and climate action initiatives. The community benefit fund under RESS-1 will deliver approximately €4.5 million a year to sustainable community initiatives targeted at those communities living in close proximity to the RESS-1 Projects. The Community Benefit Fund will continue under RESS-2

A Good Practice Principles Handbook for Community Benefit Funds was published in July 2021 and sets out the parameters of the Fund, placing community participation and decision making at its core. The Handbook provides clear guidance as to the dispersal of the funds, starting with a near neighbour payment and ensuring that minimum 40% of the fund should be distributed to local social enterprise projects aligned with the Sustainable Development Goals. A maximum of 10% of the funds can be spent on administration costs.

18.6 Community Consultation for Energy Projects.

Numerous definitions of consultation can be found. The following one appears most suitable for the context of this strategy.

'A dynamic process of dialogue between individuals or groups, based on a genuine exchange of views, and normally with the objective of influencing decisions , policies and programmes of action' (The Consultation Institute, 2003)

There are many different types of community consultation exercises and methods, which can be tailored and adapted to the particular unique set of circumstances presenting. Consultation tools include newspaper notice, press release, written correspondence, flyers/ pamphlets, door to door survey, telephone survey, social media, suggestion boxes, public exhibition, public meeting, questions and answers forum, focus groups, seminars

and conferences. Online tools including websites, social media channels, and online forums are also increasingly used to share information and to seek engagement. It is likely that a combination of a number of methods will be required at different stages of a project.

Clare County Council encourages both developers and host communities to engage in meaningful consultation with one another whenever a new energy project is being considered.

18.7 Objectives

RES 18.1 Community engagement in community energy initiatives throughout County Clare

It is an objective of Clare County Council:

- A. To support the expansion of the SEAI Sustainable Energy Communities Programme within County Clare, growing from 20 SECs to 30 SECs.
- B. To encourage community owned renewable energy projects across County Clare, availing of support available through SEAI to develop the concept and design, and availing of community RESS auction funding for project implementation.
- C. To explore, in conjunction with Eirgrid, CRU and ESB Networks, whether grid capacity can be dedicated to community projects.

RES 18.2 Community energy projects

It is an objective of Clare County Council to encourage community energy projects in the following energy sectors::

- Anaerobic Digestion (A.D.)/ Biomethane plants, which can also help protect water resources in the county.
- In the offshore and Shannon Estuary sectors, exploring community-related energy projects (tidal, wave, wind), possibly in partnership with neighbouring local authorities and communities.
- In the West Clare Municipal District, to respond to the transition commencing at Moneypoint power station
- Repurposing former landfill sites, as locations for community owned energy projects.

RES 18.3 Community Consultation for energy projects, and community benefit

It is an objective of Clare County Council:

To encourage developers of proposed renewable energy projects to carry out community consultation in accordance with best practice and to commence the consultation at the start of project planning.

RES 18.4 Community Benefit from Renewable Energy

It is an objective of Clare County Council:

To ensure that, wherever possible, community benefits are derived from all renewable energy development in County Clare. This will be through RESS community fund requirements, and also other voluntary approaches where RESS requirements do not apply.

Appendix 1 Glossary of Terms

Anaerobic Digestion: The process whereby bacteria break down organic material in the absence of oxygen yielding a biogas containing methane.

Bio-fuels: Fuels derived from biomass

Biomass: Biological material derived from living or recently living organisms which can be converted into fuel for electricity, heating or transport.

Combined Heat and Power (CHP): Combined heat and power is the simultaneous production of heat and electricity.

District Heating (DH): District heating is a local heating network facilitated through underground pipes and a centralised heat source.

Electric Vehicle (EV): Electric vehicles refer to battery electric vehicles and plug-in hybrid electric vehicles.

Environmental Appraisal: A report which sets out significant environmental issues which are of particular relevance to the zone of influence of the project.

Fossil Fuels: Fuels that arise from organic matter over geological timescales.

Greenhouse Gases (GHG): The gases that are responsible for trapping the solar radiation in the Earth's atmosphere. The most significant impact comes from carbon dioxide and methane.

Grid Capacity: The technical/physical ability of the electricity transmission or distribution network to accommodate new electricity generation or usage.

Installed Capacity: The theoretical instantaneous output of electrical power if all generators are working at full capacity.

MRIA: Marine Renewable Industry Association.

NM: Nautical miles

Pumped Hydroelectric Energy Storage (PHES): A facility designed to generate electricity during peak periods with a hydroelectric plant utilising water pumped into a storage reservoir during off-peak periods.

Smart Grid: An evolution of the existing electricity grid with added monitoring, analysis, control and communication capability that maximises the efficiency of the electricity system.

Renewable Energy: Energy from renewable non-fossil sources.

Total Final Consumption (TFC): The total energy used by the final end user. It excludes energy used in the energy sector such as electricity generation or heat production.

Units of Power

Watt (W): Unit of power output.

Kilowatt (kW): 1,000 Watts.

Kilowatt Hour (kWh): 1kW output over one hour, the unit of electricity on a standard bill.

MW (Megawatt): 1,000kW of power.

MWh (Megawatt Hour): 1MW of power output expended in one hour.

GW (Gigawatt): 1,000 MW of power.

GWh (Gigawatt Hour): 1 GW of power output expended in one hour.

TW (Terawatt): 1,000 GW of power.

TWh (Terawatt Hour): 1TW of power output expended in one hour.



Clare County Development Plan 2023–2029

Volume 5

Clare Renewable Energy Strategy

- SEA Non-Technical Summary
- SEA Environmental Report
- SEA Statement

Interim Version

April 2023



COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL



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Appendices

Appendix A Relevant Plans & Programmes for the Draft Clare RES

Appendix B Clare CDP 2023-2029 Strategic Environmental Objectives

ABBREVIATIONS

AA	Appropriate Assessment
CDP	County Development Plan
CCC	Clare County Council
CSO	Central Statistics Office
DAFM	Department of Agriculture, Food and the Marine
DTCAGSM	Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media
DCCAIE	Department of Communication, Climate Action and Environment
DCRD	Department of Community and Rural Development
DH	District Heating
EC	European Community
EEC	European Economic Community
EFW	Energy from Waste
EPA	Environmental Protection Agency
EU	European Union
GHG	Green House Gas
GIS	Geographic Information System
LAP	Local Area Plan
MPA	Marine Protected Area
NHA, pNHA	Natural Heritage Area, proposed Natural Heritage Area
NPWS	National Parks and Wildlife Service
NPF	National Planning Framework
OREDPA	Offshore Renewable Energy Development Plan
PHES	Pumped Hydroelectric Energy Storage
RBD	River Basin District
RBMP	River Basin Management Plan
RMP	Record of Monuments and Places
RSES	Regional Spatial and Economic Strategy
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SPA	Special Protection Area
SFRA	Strategic Flood Risk Assessment

1 NON-TECHNICAL SUMMARY

1.1 Introduction (Chapter 2)

Clare County Council (CCC) is currently preparing a new Clare County Development Plan 2023-2029 (hereafter referred to as the “CCDP 2023-2029”). In tandem to the preparation of the new CCDP 2023-2029, a new Renewable Energy Strategy (hereafter referred to as the “draft RES”) is being prepared and is the subject of this Strategic Environmental Assessment (SEA) Environmental Report.

The RES will set out the objectives and recommendations to be pursued to improve how CCC will support renewable energy development, energy efficiency and conservation in order to achieve balanced social and economic development throughout the County and assist with obtaining Ireland’s Green Energy Target.

This Environmental Report (ER) has been prepared in accordance with national and EU legislation as part of the SEA of the RES. The purpose of this ER is to:

- Inform the development of the draft RES;
- Identify describe and evaluate the likely significant effects of the draft RES and its reasonable alternatives; and
- Provide an early opportunity for the statutory authorities and the public to offer views on any aspect of this ER and accompanying RES documentation, through consultation.

Whilst the RES is being prepared in parallel to the preparation of the new CDP 2023-2029 so that it can be incorporated as a Volume of the CDP, it will also form a standalone document independent to the CDP as it will most likely go beyond the lifetime of the next CDP, and looks towards the year 2030. The outcome of the preparation of the RES and associated SEA will be incorporated into the new CDP.

1.2 Description of the Draft Renewable Energy Strategy (RES) (Chapter 3)

The Clare County Renewable Energy Strategy to 2030 outlines the renewable energy resource that is deliverable in County Clare. Its vision is consistent with that of the Clare County Development Plan 2023-2029, where it is an objective of the CDP to position the county as: *“The national leader in renewable energy generation which supports energy efficiency and conservation, and which achieves balanced social and economic development throughout the County and assists in achieving Ireland’s Green Energy target.”*

The draft RES acknowledges that Clare has the natural resources needed to maximise energy generation by renewable means. It acknowledges the significant contribution such renewables can make to County Clare, becoming more energy secure and less reliant on traditional fossil fuels, thus enabling future energy export and meeting assigned targets. The draft RES also recognises the importance of the infrastructure in County Clare including road, electricity, gas and broadband networks, airport, ports and the Shannon Estuary, both in supporting the development of renewables and enabling a competitive supply chain economy. It provides the necessary framework to maximise the county’s renewable energy potential and to assist it in becoming an energy secure, low carbon county, to meet renewable energy targets, with the potential to export excess energy.

The draft RES sets out clear objectives and targets for the above technologies and provide a development management framework that enables County Clare to position itself as a front runner in facilitating appropriately located and sustainable renewable energy technology. The draft RES sets out the Council’s objectives until 2030, a key date for Ireland to meet assigned national and European targets for renewable energy generation. The overarching aim of the RES is to support and facilitate Ireland in meeting the current National Renewable Energy Action Plan (NREAP) targets required under Article 4 of Directive 2009/28/EC on Renewable Energy. This outlines binding targets for renewable energy in electricity, heat and transport.

1.3 Methodology (Chapter 4)

In order to assess the preferred approach to the RES (the ‘Preferred Scenario’) and its objectives, the SEA has fed into the development of the Draft RES. This will ensure that the Preferred Scenario is robust and that the objectives, technologies and location specific information contained within the draft RES have been assessed, as outlined in Chapter 9 of this report. In addition, the SEA has considered that the RES is a draft and therefore is open to consultation under the SEA process.

This Environmental Report contains the findings of the assessment of the likely significant effects on the environment resulting from implementation of the draft RES. It reflects the requirements of the SEA Directive (2001/42/EC) on the assessment of the effects of certain plans and programmes on the environment and also the transposed regulations in Ireland (S.I. 435/2004) as amended by S.I. 200/2011.

In addition, the Habitats Directive Article 6(3) requires that “Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.” In recognition of this, Appropriate Assessment (AA) of the draft RES under Article 6(3) of the Habitats Directive has been carried out in parallel with the SEA process, with the findings used to guide the development of policies and objectives considered as part of the SEA. The results of the assessment are included in a separate document, a Natura Impact Report (NIR), which is also available for public review.

Integration of the SEA and draft RES was achieved through close involvement of relevant team members in all stages of the project, including SEA scoping, review of the existing environment and generation of policies and objectives. The SEA, AA and RES teams participated in several meetings and telephone discussions in relation to development of alternatives and development of the assessment methodology. Based on the requirements of the legislation and guidance, **Table 1.1** outlines the information provided in the Environmental Report.

Table 1.1: Requirements of the SEA Directive and Relevant Section in Environmental Report

Requirement of SEA Directive (Article 5(1) Annex I)	Chapter of ER
An outline of the contents and main objectives of the plan or programme, or modification to a plan or programme, and relationship with other relevant plans or programmes.	Chapter 2: Description of the Renewable Energy Strategy (RES) (2022) Chapter 6: Review of Relevant Plans and Programmes
The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme, or modification to a plan or programme.	Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)
The environmental characteristics of areas likely to be significantly affected.	Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)
Any existing environmental problems which are relevant to the plan or programme, or modification to a plan or programme, including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or the Habitats Directive.	Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)
The environmental protection objectives, established at international, European Union or national level, which are relevant to the plan or programme, or modification to a plan or programme, and the way those objectives and any environmental considerations have been taken into account during its preparation.	Chapter 6: Review of Relevant Plans and Programmes Chapter 7: Environmental Protection Objectives and Sea Framework for Assessment
The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.	Chapter 9: Assessment of Preferred Scenario Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme, or modification to a plan or programme.	Chapter 10: Mitigation and Monitoring
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	Chapter 8: Alternatives
A description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan or programme, or modification to a plan or programme.	Chapter 10: Mitigation and Monitoring
A non-technical summary of the information provided under the above headings.	Non-technical Summary

1.4 Environmental Baseline (Chapter 5)

As this SEA deals with renewable energy within County Clare, the baseline data is mainly focused within the county. However, in order to identify the potential for cumulative impacts to occur, the immediate environs of County Clare are also considered.

According to recent EPA publications (EPA, 2020), Ireland's natural environment, although under increasing pressure, generally remains of good quality and represents one of the country's most essential national assets. In the 7th and most recent state of the environment review Ireland's Environment – An Integrated Assessment 2020¹, the EPA outlines a summary scorecard for the progress being made across key environmental policy areas as well as the general trends/outlook. The existing environmental pressures within County Clare are set out in **Table 1.2**.

Table 1.2: Existing Environmental Issues in County Clare relevant to the draft RES

Topic	Existing Pressures
Population/ Human Health	<p>Whilst a growth in population is evident in County Clare unemployment and retaining a young working population in western counties remains the main issue. There are 5 Seveso sites in the draft RES area. Renewable energy (RE) development will result in employment opportunities and retaining future work force within the County.</p> <p>The interaction between the natural environment, and the state and health of that environment, tied to human health and wellbeing, as well as sustainable living. Renewable energy is recognised as a component in creating a sustainable, low-carbon and circular economy.</p>
Traffic	<p>In recent years population growth and increasing development has placed additional pressure on the existing road network.</p>
Cultural Heritage	<p>Inappropriate developments may impact on the known and sub-surface archaeological heritage features. In particular, there is existing pressure from dredging of the Shannon Estuary which has the potential to disturb historical shipwrecks, as only several are in known locations. Inappropriate developments adjacent to protected structures is an existing pressure.</p>
Air and Climate	<p>Air quality is generally good in the County, with Clare's geographical location in an area with a relatively mild climate which has an almost continuous movement of clean air. The biggest threat now facing air quality is emissions.</p> <p>Renewable electricity development under the Draft RES would lead to predominantly positive implications for air quality, where such development takes the form of wind and solar for instance, as the most common RES deployments in Ireland. While there would be impacts to air quality during the construction and decommissioning phases of any RE infrastructure, the long-term impact is positive as there are no combustion-related emissions associated with the operational phase.</p> <p>Ireland has a long way to go to reach national and European targets, and is not on track for meeting 2030 or 2050 targets for emissions reductions. The EPA states that the energy sector needs to shift away from the over-reliance on fossil fuels in order to effectively tackle climate change. As the RES will form a strategy for the future development of RE (namely wind and solar), it will directly contribute to Ireland's and Clare's approach for addressing climate change, as rapid deployment of renewable energy sources is required to replace fossil-fuel dependence.</p> <p>The RES will also address other sources of Green House Gas Emissions (GHG) in particular from road traffic which is the biggest contributor to greenhouse gas emissions in County Clare and Ireland in general.</p>
Inland and Marine Waters	<p>The Water Framework Directive (WFD) for surface and groundwaters, and the Marine Strategy Framework Directive (MSFD) for marine waters, are the primary legislation for achieving water quality in Ireland. While Ireland's surface and groundwater water quality compares favourably with other EU Member States, there are ongoing pressures and problems associated with achieving and maintaining at least good status in line with the WFD, while the MSFD's Programme of Measures were established in 2016 with implementation and monitoring ongoing.</p> <p>Currently the 3rd cycle National River Basin Management Plan for 2022–2027 is being prepared. Of the 46 Catchment management units in Ireland Clare County is part of 4 of them- Lower Shannon, Shannon Estuary North, Mal Bay and Galway Bay South East.</p>

¹ EPA (2020) Ireland's Environment – An Integrated Assessment. Available at: <https://www.epa.ie/irelandsenvironment/stateoftheenvironmentreport/>

Topic	Existing Pressures
	<p>A range of activities occurring in these catchments have been identified which are putting pressure on water quality. The main pressures include agricultural runoff, one-off housing with associated individual on-site treatment systems, wastewater and industrial discharges, hydromorphology and forested areas which are poorly managed, lake impoundments and alterations in drainage at important transitional waterbody areas such as ports.</p> <p>The water environment also hosts many European and nationally designated sites. The key aspects of the water environment in relation to the RES are that increased RE development could lead to impacts to the water environment (including the marine environment in the case of offshore wind), such as sediment released during construction, with knock-on effects for aquatic flora and fauna. There is also the potential for development to facilitate the spread of aquatic invasive species.</p> <p>Another key issue facing County Clare over the past number of summers has been water quality of our bathing waters. In 2020 many beaches throughout the county saw rolling closures following periods of heavy rainfall.</p>
Waste Management	<p>Ireland continues to move from a position of almost total reliance on landfill, to a high level of recovery, with a focus on prevention, reuse and recycling. More value is now being derived from waste as fuel than from disposal, with the number of landfills reducing from 18 in 2012 to 3 operational municipal landfills as of 2021, however much of Ireland's residual waste continues to be exported which has implications for infrastructural capacity and market security. Of note is that Ireland only has one landfill which can receive contaminated waste (lightly contaminated). Future large-scale RE development proposals have the potential to lead to the generation of wastes, such as historically contaminated soils, which need to be handled and disposed of/ exported, and this has implications for large-scale renewables deployment.</p>
Flood Prevention	<p>There are areas in County Clare subject to flooding. In-house flood risk assessment carried out by Clare County Council, in addition to a Strategic Flood Risk Assessment carried out for the SEA of the CDP, found that the county is vulnerable to flooding from a number of hazard sources including: fluvial (river flooding), pluvial (flooding due to rainfall or other precipitation), coastal (e.g. tidal surges), groundwater (notably in karst regions, such as the Burren); flooding from canals and reservoirs; and flooding in urban areas due to inadequate drainage and over-capacity sewers.</p> <p>Floodplains should be preserved as they are valuable resource for mitigating flood risk and inappropriate development should be avoided.</p>
Biodiversity	<p>The county contains a significant number of designated sites, including SACs, SPAs, NHAs, pNHAs and Ramsar sites which demonstrates the important ecological status of the county - Clare is home to the River Shannon and River Fergus Estuaries SPA, Cliffs of Moher SPA, Lower River Shannon SAC and East Burren Complex SAC - some of the most important European sites in Ireland.</p> <p>The main impacts to biodiversity in Clare are habitat loss and fragmentation, climate change and invasive species. Agricultural practices which are intensified or abandoned also put increasing pressure on biodiversity, as does surface run off, housing developments, sites which are contaminated and monoculture developments.</p> <p>The key issues associated with the development of the RES on biodiversity relate to impacts to mobile species (particularly birds and bats from wind energy), disturbance effects and scare responses, loss/ fragmentation of habitats and disturbance to species/ spread of invasives from land use change, emissions to water courses, as well as cumulative effects resulting from numerous developments. Developments in lacustrine, fluvial and estuarine systems such as from the development of hydro and wind energy projects have the potential to impact on designated sites and biodiversity through disturbance to habitats, dredging and construction activities.</p> <p>The potential impacts to biodiversity from RE development are acknowledged, however the impacts to biodiversity from climate change are also significant, including changing migration patterns, loss of food sources, proliferation of invasive or alien plants and animals, etc. The development of RE projects will have positive impacts in the long term as they will contribute to reduced GHG emissions. While the Draft RES sets the framework for development, it itself does not confer planning consent and any RE proposal will require detailed environmental assessments at project level.</p>
Soils/ Geology	<p>Soil is a valuable, non-renewable resource that supports and underpins many ecosystem services such as biodiversity, food production and natural drainage. Key pressures include erosion, compaction, sealing, contamination from various activities and development in areas where the depth of soil is insufficient. In terms of land and land use, in addition to renewable energy development, sectoral competition and demand for land e.g. forestry, agriculture, can</p>

Topic	Existing Pressures
	<p>put pressure on land and soil in terms of available space and resources, and land use changes. It is noted that there is a lack of legislative protection for soils in general at both European and national level. There are potential negative impacts for land and soils where RE development occurs on greenfield areas. Erosion of soils and increased sediment movement or emission to watercourses can also occur during the construction phase of RE development. RE development may also be targeted to peatland areas and bogs; bogs are a non-renewable resource, and are host to protected habitats and species. They can also form significant carbon sinks where the bog is healthy and active.</p> <p>Geothermal energy developments need to be located away from karst areas or where there is an existing high groundwater vulnerability rating and a shallow soil profile (which are unable to accommodate subsurface structures). RE developments should also be located away from significant peat or bog areas.</p>
Landscape	<p>Pressures from developments which may affect the visual and amenity character of landscape, such as may occur under the Draft RES, include the visual impact of turbines (including any potential for cumulative effects) or the construction of other such developments. Hydro or offshore wind developments may impact the visual/scenic quality of seascapes, depending on location and this needs to be balanced against site suitability.</p>
Material Assets	<p>Lack of a security of supply for thermal treatment facilities is recognised as a threat, as is the lack of adequate facilities for biological waste treatment.</p> <p>There is high technical potential for hydro power in Clare given the county's large coastline and water resources. Clare has a history of utilising hydro power (e.g. Ardnacrusha hydroelectric power station) – however realistic plans will be influenced by specific site conditions. Developments could also be influenced by fishery interests and seasonal water flow, and balanced with the needs of tourism. Other constraints include establishing adequate grid connections and lack of interconnections with neighbouring countries (connected countries can buy and sell power during seasonal fluctuations without the need to store energy); the need to be in close proximity to existing wind energy developments, high capital costs and policy gaps at the National and Regional level (currently no guidance for energy storage or site selection) are other considerations.</p> <p>While Pumped Hydroelectric Energy Storage (PHES) is the most mature and largest energy storage technique available, these developments are also constrained by high capital costs, long lead-in times and policy gaps at the National and Regional levels.</p> <p>For anaerobic digestion (AD) developments, there is a lack of facilities to treat biological waste to generate energy. The 3 regional waste management plans 2015-2021 will be consolidated into one National Waste Management Plan for the next 6 year cycle with the development of A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025 which will aim to preserve resources, reduce consumption, and reduce waste at all levels of society.</p> <p>For offshore wind developments, the National Marine Planning Framework (NMPF), is identified as part of a suite of marine planning reform measures to modernise elements of the marine development management, along with the need to balance the installation of such developments with fishing, aquaculture, tourist and navigational needs and interests.</p> <p>All renewable energy developments have the potential to effect or impart environmental pressures in particular on biodiversity, habitats/designated areas and water quality, in addition to the visual impact to scenic landscapes and settlements.</p>

In accordance with the SEA Directive, the inter-relationship between the SEA environmental topics must be taken into account. The key inter-relationships identified in this SEA are set out in **Table 1.3**. Of particular note are the primary relationships between water quality and biodiversity, flora and fauna. Flora and fauna, including protected species and habitats, rely directly on the aquatic environment as a habitat. Water and climate also have a key relationship.

Global GHG emissions associated with the burning of fossil fuels, transport, industry and other sources have the potential to negatively impact on climate change. This in turn can result in more frequent and more intense flooding and drought conditions affecting material assets, such as private residences and infrastructure, and biodiversity through changes in water quality and the hydrologic regime.

Table 1.3: Inter-relationships between SEA Topics

Population & Human Health	✓							
Land & Soil	✓	✓						
Water	✓	✓	✓					
Air Quality	✓	✓	✓	✓				
Climatic Factors (including CCM, CCA)	✓	✓	✓	✓	✓			
Material Assets	✓	✓	✓	✓	✓	✓		
Cultural Heritage	X	✓	✓	✓	X	✓	✓	
Landscape	✓	✓	✓	✓	✓	✓	✓	✓
	Biodiversity Flora, Fauna	Population & Human Health	Land & Soil	Water	Air Quality	Climatic Factors (including CCM, CCA)	Material Assets	Cultural Heritage

✓ = interrelationship anticipated

X = no interrelationship anticipated

Clare's population was approximately 119,000 persons in 2016 and this is projected to increase to between 129,500 and 131,500 by the year 2026. In the absence of the RES there may be pressure to meet the county's energy demand. The RES aims to maximise the county's renewable energy potential and assist Clare in becoming an energy secure, low carbon county while meeting renewable energy targets, with the potential to export excess energy.

Of particular note are the primary relationships between water quality and biodiversity, flora and fauna. Flora and fauna, including protected species and habitats, rely directly on the aquatic environment as a habitat. Water and climate also have a key relationship. Global GHG emissions associated with the burning of fossil fuels, transport, industry and other sources have the potential to negatively impact on climate change. This in turn can result in more frequent and more intense flooding and drought conditions affecting material assets, such as private residences and infrastructure, and biodiversity through changes in water quality and the hydrologic regime.

Local solutions to this international issue include utilisation of renewable energy technologies and reductions in the burning of fossil fuels and unsustainable transport movements, which is highly encouraged under the proposed RES.

1.5 Review of relevant Plans and Programmes (Chapter 6)

A review of plans, policies and programmes relevant to the Draft RES was carried out. The review focussed primarily on National, European and International plans and programmes. The purpose of this review is to take into consideration the policy and legislative framework within which the Draft RES is being developed. Consideration was given to the key statutory and non-statutory plans, programmes and policies relevant to the Draft RES in order to inform the draft SEA Strategic Environmental Objectives and Targets.

The findings of the review helped define the draft objectives for the SEA and informed the assessment of alternatives. Some of the key plans, programmes and policies include:

- Kyoto Protocol;
- EU 2030 Climate and Energy Framework;
- Ireland's Transition to a Low Carbon Energy Future (2015-2030) White Paper;
- Climate Action and Low Carbon Development (Amendment) Act 2021;
- Ireland's Climate Action Plan 2021;
- National Energy and Climate Plan 2021-2030;

- National Renewable Energy Action Plan;
- National Adaptation Framework;
- National Planning Framework;
- National Development Plan (2018-2027);
- Strategic Integrated Framework Plan for the Shannon Estuary (2013-2020);
- Water Framework Directive (2000/60/EC);
- EU Habitats Directive (92/43/EEC);
- EU Birds Directive (2009/147/EC);
- EU Floods Directive (2007/60/EC);
- EU Biodiversity Strategy to 2030;
- National Biodiversity Action Plan (2017-2021); and
- County Clare Biodiversity Action Plan (2017-2023).

1.6 Environmental Protection Objectives and SEA Framework for Assessment (Chapter 7)

There are essentially three types of objectives considered as part of this SEA. The first relates to the objectives of the RES. The second relates to wider environmental objectives, i.e. environmental protection objectives at a national, European and international level (see **Chapter 6**), and finally there are the Strategic Environmental Objectives (SEOs), which were devised to test the effects of the draft RES on the wider environment.

The SEOs reflect the existing environmental issues relevant to the draft RES. They are focused on protecting and enhancing the natural and human environment and on minimising negative effects. The objectives were developed to be consistent with the environmental protection objectives established by international, European and national environmental policies, objectives and standards. The selected objectives for this SEA are listed in **Table 1.4**.

Table 1.4: Strategic Environmental Objectives

SEA Topic	Strategic Environmental Objective	To what degree will the draft RES ensure...
Population and Human Health (PHH)	PHH1: Ensure that renewable energy (RE) developments are planned, constructed and operated in a manner that avoids or minimises adverse impacts on local residents/communities (including their quality of life) and maximises the community benefit of such developments.	<ul style="list-style-type: none"> • No significant deterioration in human health as a result of environmental factors. • Compliance with requirements for set-back distances from wind energy developments (Revised Wind Energy Development Guidelines (to be published). • Provision of security of energy supply to residents in County Clare. • Provision of community gain through RE developments • Encourage improved energy efficiency.
	PHH2: To protect human health from hazards or nuisances arising from incompatible RE-related land uses/developments.	<ul style="list-style-type: none"> • No significant deterioration in human health as a result of changes to environmental factors. • Protection of drinking water from indirect impacts associated with developing RE projects • Reduce population exposure to high levels of noise from RE development. • Compliance with requirements for set-back distances from wind energy developments (Revised Wind Energy Development Guidelines (to be published).

SEA Topic	Strategic Environmental Objective	To what degree will the draft RES ensure...
Biodiversity, Flora and Fauna (BFF)	B1: Protect, conserve, enhance where possible and avoid loss of diversity and integrity of the broad range of habitats, species and wildlife corridors in line with the Birds and Habitats Directives in line with the Birds and Habitats Directive.	<ul style="list-style-type: none"> Provide effective protection of designated sites for habitats and species.
	B2: Conserve and protect other sites of nature conservation including NHAs, pNHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries as well as protected species outside these areas as covered by the Wildlife Act.	<ul style="list-style-type: none"> Provision of effective protection and conservation to NHAs, pNHAs, Nature Reserves, Wildlife Sanctuaries and Habitats Directive Article 10 sites. Provision of effective protection and conservation to species protected under the Wildlife Act. Protection of habitats from unnecessary disruption from RE development.
	B3: To minimise and, where possible, eliminate threats to bio-diversity including invasive species.	<ul style="list-style-type: none"> Avoidance of spread or introduction of invasive species as a result of RE projects. Contribution towards the protection of habitats from invasive species.
	B4: Promote green infrastructure networks, including riparian zones and wildlife corridors as part of RE developments.	<ul style="list-style-type: none"> Promotion of green infrastructure within RE applications
Water (W)	W1: Protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem (quality, level, flow).	<ul style="list-style-type: none"> Protection of habitats and species by ensuring RE development does not alter their water needs in terms of water quality, flow rates, levels etc
	W2: Maintain or improve the quality of all surface waters and groundwater (including estuarine and marine water) in line with the requirements of the Water Framework Directive, the National Marine Planning Framework and the objectives of the National River Basin Management Plan with particular emphasis on restoring high status waters through the Blue Dot Catchment Programme.	<ul style="list-style-type: none"> Achieve or maintain at least Good Status, and no deterioration of existing status, for surface and groundwater bodies in line with the requirements of the WFD and the National River Basin Management Plan by 2027. Contribute to achieving and maintaining Good Environmental Status for marine waters in line with the requirements of the MSFD, and under the National Marine Planning Framework.
	W3: Implement appropriate sustainable drainage systems (SuDS) in the various renewable energy projects.	<ul style="list-style-type: none"> New drainage systems for any renewable energy projects to be compliant with SuDs.
	W4: Avoid the impact of polluting substances from any RE developments to all waters and prevent pollution and contamination of groundwater by adhering to aquifer protection plans and to maintain and improve the quality.	<ul style="list-style-type: none"> Achieve or maintain at least Good Status, and no deterioration of existing status, for surface and groundwater bodies in line with the requirements of the WFD and the National River Basin Management Plan by 2027.
	W5: Protect flood plains and areas of flood risk from RE development through avoidance, mitigation and adaptation measures.	<ul style="list-style-type: none"> In accordance with OPW and the Flood risk and Management Guidelines 2009, ensure RE developments do not contribute to flood risk.
Land and Soils (Geology) (LS)	S1: To maximise the sustainable re-use of the existing built environment, derelict, disused and infill sites (brownfield sites), rather than greenfield sites for RE development. (<i>This is in line with the Active Land Management Strategy RPO34 – Regeneration, Brownfield, Infill Development</i>)	<ul style="list-style-type: none"> Preference for development on brownfield site over green field. Limited and controlled development of greenfield sites. Avoid incidences of soil contamination.
	S2: Minimise the excavation and movement of soils within site works associated with RE developments.	<ul style="list-style-type: none"> Soils is reused on site where possible. Limit the amount of excavation in sensitive locations for example peat excavation in wind farm sites.

SEA Topic	Strategic Environmental Objective	To what degree will the draft RES ensure...
		<ul style="list-style-type: none"> Ensure sustainable extraction of non-renewable sand, gravel and rock deposits and the reuse and recycling of construction and demolition waste.
	S3: Minimise the consumption of non-renewable deposits on site.	<ul style="list-style-type: none"> Re-use of soils from redeveloped sites where possible
	S4: Minimise the amount of waste to landfill from RE development in line with the waste management hierarchy.	<ul style="list-style-type: none"> Reduction in the quantities of waste sent to landfill. Increase in the quantities of waste sent for recycling and recovery. Compliance with national and regional waste planning and Ireland's National Waste Policy 2020-2025.
	S5: Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites.	<ul style="list-style-type: none"> Avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites
	S6: No contribution to landslide or slope instability from renewable energy development.	<ul style="list-style-type: none"> Minimise potential for disruption to, and loss of, sensitive soil and land resources. Avoid topographically unsuitable areas.
	S7: Protect against the displacement of agricultural food crops.	<ul style="list-style-type: none"> Protection of agricultural food crop area.
Climatic Factors (including air quality) (CF)	C1: Meet relevant air and noise standards and support initiatives to reduce air and noise pollution.	<ul style="list-style-type: none"> Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030 and Climate Action Plan (2019). Facilitate the introduction and construction of infrastructure to support the renewable energy sector. Achieve transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050 in line with the Climate Action Plan (2019)
	C2: Contribute towards a reduction of Greenhouse Gas Emissions in line with relevant targets.	<ul style="list-style-type: none"> Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030
	C3: Contribute to mitigation of, and adaption to climate change.	<ul style="list-style-type: none"> Contribute to reducing GHG emissions Maximise the use of renewable energy resources and reduce the dependency on fossil fuels Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030 No increase in flood risk from RE development Protection of biodiversity from potential impacts from climate change
Climate Change – Mitigation Measures (CCM)	CC2: Decrease the usage of fossil fuels and increase both renewable resource usage and protection together with a move towards more low carbon energy sources.	<ul style="list-style-type: none"> Facilitate implementation of sustainable modes of transport (i.e. provision of charging points) Increase in renewable energy developments Reduction on use of fossil fuels Promote the use of renewable and sustainable resources (i.e. biomass, AD, offshore wind, hydro and geothermal energies) Improve efficiency of energy infrastructure
	CC3: Integrate Climate Change mitigation measures into every fabric of spatial planning through the restriction of inappropriate development/land-use zoning in flood risk	<ul style="list-style-type: none"> Avoidance of inappropriate development of RE infrastructure in sensitive areas i.e. flood risk zones

SEA Topic	Strategic Environmental Objective	To what degree will the draft RES ensure...
	zones, inclusion of green infrastructure as the status quo and the incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all developments.	<ul style="list-style-type: none"> Incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all RE developments
	CC4: Maintain and protect our natural carbon sinks (bogs/marshes/forests/fens) as decarbonising areas which can serve a dual purpose in terms of enhancement of biodiversity and mitigation against Climate Change.	<ul style="list-style-type: none"> Protection of carbon sinks
Climate Change – Adaptation Measures (CCA)	CC5: Encourage and support the utilisation of energy-efficient and water-efficient building design to better equip homes and businesses to cope during times of shortage and service interruption, such as grey-water recycling, the use of solar PVs, passive houses etc.	<ul style="list-style-type: none"> Promote the use of renewable and sustainable resources in building design (i.e. solar, passive houses) Improve energy efficiency of infrastructure
	CC6: Encourage the retrofitting of buildings with a particular focus on the existing council housing stock ensuring a Just Transition for all.	<ul style="list-style-type: none"> Improve energy efficiency of existing infrastructure
Cultural Heritage (CH)	CH1: Protect and conserve the cultural heritage including the built environment and settings; archaeological (recorded and unrecorded monuments), architectural (Protected Structures, Architectural Conservation Areas, vernacular buildings, materials and urban fabric) and manmade landscape features (e.g. field walls, footpaths, gate piers etc.) of the county.	<ul style="list-style-type: none"> No permitted renewable energy developments which involves loss of cultural heritage, including protected structures, archaeological sites, Architectural Conservations Areas and landscape features
	CH2: To ensure the restoration and re-use of existing uninhabited and derelict structures where possible opposed to demolition and new build (to promote sustainability and reduce landfill).	<ul style="list-style-type: none"> Re-use of existing buildings as opposed to demolition or new buildings
Landscape (LandS)	L1: Ensure no significant disruption of historic/cultural landscapes and features, through objectives of the RES.	<ul style="list-style-type: none"> Ensure no significant disruption of historic/cultural landscapes, seascapes and features through objectives of the RES.
	L2: Ensure there is no significant visual impact from RE development on both landscapes and seascapes.	<ul style="list-style-type: none"> No significant visual impact from development.
Material Assets - Transport	T1: Maximise sustainable modes of transport and encourage use of renewable transport technologies.	<ul style="list-style-type: none"> Facilitation in the implementation of sustainable modes of transport (i.e. provision of charging points) Uptake of renewable transport technologies
Material Assets – Waste	WA1: Implement the waste pyramid and encourage reuse/recycling of material wherever possible.	<ul style="list-style-type: none"> Reduction in the quantities of waste sent to landfill from Renewable energy projects Increase in the quantities of waste sent for recycling from renewable energy projects. Compliance with the Southern Region Waste Management Plan and Irelands National Waste Policy 2020-2025.
Material Assets - Water	WS1: To ensure adequate and clean drinking water supplies.	<ul style="list-style-type: none"> Ensure RE infrastructure does not negatively impact on water supply
Material Assets – Renewable Energy	RE1: Reduce waste of energy, promote use of renewable energy sources and support energy conservation initiatives across all sectors including the development of low carbon business practices and buildings.	<ul style="list-style-type: none"> Increase in renewable energy developments. Contribute to improved energy efficiency.

The right-hand column sets out a series of questions as to what degree the draft RES will (or will not) contribute to the SEOs to provide a way of assessing the environmental effects of implementing the draft RES. These were considered over the duration of the baseline data collection and assessment, and throughout the consultation process, in order to ensure relevance to the SEOs as well as the objectives of the draft RES. Further detail on the SEA framework for assessment are presented in **Chapter 7** of this report.

1.7 Alternatives (Chapter 8)

Article 5 of the SEA Directive requires the environmental report to consider ‘reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme’ and the significant effects of the alternatives selected. Alternatives must be realistic and capable of implementation and should present a range of different approaches within the statutory and operational requirements of the Draft RES.

The strategic, temporal/prioritisation and modal alternatives, further detailed in **Chapter 8**, were considered for assessment as part of the SEA process for the draft RES. A detailed assessment was undertaken analysing the reasonable and realistic alternatives against the SEOs.

As a key objective of the draft RES is to meet all of County Clare’s energy needs from 100% renewable resources, in preparing a RES the different types of renewable energy resources to be harnessed was considered, and the scale or proposed outcome of the successful delivery of such a strategy. The alternatives considered were:

- **Strategic:**
 - Alternative 1A: Do Nothing;
 - Alternative 1B: National Renewable Targets; and
 - Alternative 1C: Maximise Renewable Resources.
- **Temporal/Prioritisation:**
 - Alternative 2A: Onshore Priority;
 - Alternative 2B: Marine (Offshore) Priority; and
 - Alternative 2C: Combination of Onshore plus Planning for Offshore.
- **Modal:**
 - Alternative 3A: Mixed Use Technology as per the Existing RES; and
 - Alternative 3B: Expanded Modal Scope.

The preferred scenario that emerged for the draft RES after assessment was a combination of alternatives **1C, 2C and 3B**, with a combination of community/household and utility-scale RE development. A detailed assessment of the preferred alternative was subsequently undertaken and is detailed in **Chapter 9**.

1.8 Assessment of Preferred Scenario (Chapter 9)

The purpose of this section of the Environmental Report is to evaluate as far as possible the environmental effects of the preferred scenario, including the draft RES objectives, and to set out measures envisaged to prevent, reduce and as far as possible offset any significant adverse effects on the environment. The objectives of the draft RES have been assessed against the SEOs across the topic areas of: Biodiversity Flora and Fauna; Population and Human Health; Land and Soils; Air and Climate; Water; Material Assets; Architectural, Archaeological and Cultural Heritage; and Landscape (refer to **Chapter 7** and **Chapter 9**). The approach used for assessing the objectives was a baseline and objectives-led assessment using assessment matrices.

The Draft RES outlines objectives in relation to a number of different technologies, such as Bioenergy (Biomass) and Anaerobic Digestion, Micro Renewables, Geothermal & Ground Source Heat Pump, Solar, Onshore Wind, Marine Renewables (Wave and Tidal Energy), Micro Hydroelectric and Pumped Hydro Energy Storage. The different technologies all have the potential for environmental impacts, both positive (in terms of increasing renewable energy, contributing to county and national targets, improved air quality depending on development type etc.) as well as negative impacts. The energy efficiency policies within the draft RES are broadly positive through energy efficiency measures within existing building stock. However,

there is potential for impacts on certain receptors through new RES infrastructure (e.g. protected structures), or effects on protected species through retrofitting e.g. bats.

Therefore an overview of the technology types is presented in **Chapter 9** in **Table 9.1.1**, and the typical environmental effects associated with RES technologies are set out in **Table 9.1.2** and **Table 9.1.3**.

Cumulative Assessment

Cumulative effects are referred to in a number of SEA guidance documents and are defined in the EPA SEA Process Checklist (2011) as *“effects on the environment that result from incremental changes caused by the strategic action together with other past, present, and reasonably foreseeable future actions. These effects can result from individually minor but collectively significant actions taking place over time or space”*.

Therefore the combined effect of human activity can pose a serious threat on our environment. These effects can be insignificant individually but cumulatively over time and from a number of sources can result in the degradation of sensitive environmental resources.

The following approach was undertaken in relation to assessing the potential cumulative and in-combination effects of the draft RES. It included:

- Interaction of measures within the draft RES; and
- Interaction from policies and proposals in other related plans, programmes and policies.

A number of potential cumulative impacts were identified and mitigation measures were outlined and included in **Section 9.3**.

1.9 Mitigation and Monitoring (Chapter 10)

The Environmental Report has highlighted the more significant potential positive and negative environmental impacts from the implementation of the draft RES. It has also had regard to the assessment work carried out to inform the Appropriate Assessment of the draft RES. **Chapter 10** of this environmental report presents the mitigation measures from both the SEA and AA which are envisaged to prevent, reduce and as fully as possible offset and significant adverse effects on the environment of implementing the RES.

Article 10 of the SEA Directive also requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of the draft RES, with the view to taking remedial action where adverse effects are identified through monitoring.

The monitoring programme as proposed focuses on aspects of the environment that are likely to be significantly impacted by the draft RES. Where possible, targets and indicators have been chosen based on the availability of the necessary information and the degree to which the data will allow the target to be linked directly with the implementation of the draft RES. The indicators/monitoring aim to act as an early warning sign so that appropriate remedial action is undertaken; where possible, remedial actions have been set out.

It should be noted that the monitoring programme has been designed to be flexible and will be finalised post-consultation, also giving consideration to any feedback received on the CDP monitoring programme, and as such all suggestions are welcome. It is intended that the monitoring will be integrated into the final RES.

1.10 Next Steps (Chapter 11)

There is still some important work to be done before the Renewable Energy Strategy can be adopted. The next step in the SEA and SEA process will be a public consultation period. During this time, comments on the findings of the Environmental Report, the Natura Impact Report, and the content of the draft RES may be submitted for consideration. **Table 1.5** outlines the remaining steps in this process.

Table 1.5: Remaining Steps in the Draft RES, SEA and AA Processes

Renewable Energy Strategy	Strategic Environmental Assessment and Appropriate Assessment
Publication of draft RES	Publication of Environmental Report and Natura Impact Report
End of statutory consultation	End of statutory consultation. Review of submissions and preparation of SEA Statement
Review of submissions and amendments to the draft RES	Review of submissions and preparation of SEA Statement
Adoption of the draft RES	March 2023
Publication of final RES	Publication of SEA Statement April 2023

Written submission or observation on the Draft RES or associated environmental reports can be made, preferably in 'word' format, to one of the following media:

Email: devplan@clarecoco.ie

Mail: **Clare Renewable Energy Strategy (SEA Consultation),
Planning Department,
Clare County Council,
Áras Contae on Chláir,
New Road,
Ennis,
County Clare.
V95 DXP2**

The final date for responses in respect of this consultation is **4pm on 28th March 2022**.

These submissions/ observations will be taken into consideration before finalisation of the Draft RES. Early responses would be appreciated to allow more time to clarify and resolve issues that may arise. It should be noted that in the interests of transparency, all submissions received may be published on CCC website and subject to Freedom of Information.

2 INTRODUCTION

Clare County Council (CCC) is currently preparing a new Clare County Development Plan 2023-2029 (hereafter referred to as the “CCDP 2023-2029”). In tandem to the preparation of the new CCDP 2023-2029, a new Renewable Energy Strategy (hereafter referred to as the “draft RES”) is being prepared and is the subject of this Strategic Environmental Assessment (SEA) Environmental Report.

The draft RES sets out the objectives and recommendations to be pursued to improve how CCC will support energy efficiency and conservation to achieve balanced social and economic development throughout the County and assist with obtaining Ireland’s ‘Green Energy Target’.

This Environmental Report (ER) has been prepared in accordance with national and EU legislation as part of the SEA of the RES. The purpose of this ER is to:

- Inform the development of the draft RES;
- Identify describe and evaluate the likely significant effects of the draft RES and its reasonable alternatives; and
- Provide an early opportunity for the statutory authorities and the public to offer views on any aspect of this ER and accompanying draft RES documentation, through consultation.

Whilst the draft RES is being prepared in parallel to the preparation of the new CCDP 2023-2029 so that it can be incorporated as a volume to the CDP, it will also form a standalone document independent to the CDP as it will most likely go beyond the lifetime of the next CDP. The outcomes of the preparation of the draft RES and associated SEA will be incorporated into the new CDP.

Further information and related documentation on the CCDP 2023-2029 can be found at the following link:
<https://www.clarecoco.ie/services/planning/>

2.1 Overview of the Draft RES

Clare County Council wants to ensure that County Clare has the necessary land use and strategy framework in place to maximise its significant renewable energy resource, to provide a degree of certainty to future investors and local communities and to inform and guide the planning process for future renewable energy development. The delivery of RES will be dependent on County Clare building on its existing high quality energy infrastructure. The vision of RES is in line with one of the Clare County Development Plan’s key goals is:

VISION

A County Clare that is the national leader in renewable energy generation which supports energy efficiency and conservation, and which achieves balanced social and economic development throughout the County and assists in achieving Ireland’s Green Energy target.

The strategic aims of the draft RES are:

- (a) To support the attainment of and to exceed in County Clare, where possible, the National targets and commitments to renewable energy.
- (b) To identify/highlight the opportunities for various renewable energy technologies and resources and identify broad areas suitable for their development in full compliance with the requirements of all environmental legislation including the requirements of the Strategic Environmental Assessment Directive, Habitats Directive and Water Framework Directive.
- (c) To provide an evidence-based strategy founded on understanding the local feasibility and potential for renewable and low carbon technology, predicated upon optimising the County's natural and socio economic, advantages and key assets, core skills, and nearby research institutes.
- (d) To maximise the opportunities for renewable energy development whilst safeguarding the environment and existing residential amenities.
- (e) To safeguard, where appropriate, areas with potential for renewable energy projects and to guide renewable energy development to preferred locations.
- (f) To set out policies and objectives for the main renewable sectors subject to Strategic Environmental Assessment (SEA) and Habitats Directive Assessment (HDA) requirements.
- (g) To provide guidance on energy efficiency and conservation.
- (h) To provide a clear development management framework.

2.2 Study Area

Clare is a coastal county on the western seaboard and bounded by the counties of Galway, North Tipperary and Limerick as shown in **Figure 2.2-1**. The County contains a number of settlements in a range of urban and rural locations. Ennis is the County town and largest settlement with a population of approximately 25,276 (in 2016). It is designated as a "Key Town" in the Regional Spatial and Economic Strategy for the Southern Region, and as the County Town for Clare is an important residential, service and commercial centre providing significant levels of employment.

Shannon Town was developed from the 1960's onwards in response to the growth and development of Shannon Airport and the Shannon Free Zone Industrial Estate and in 2016 had a population of 9,729 people. It is a world leader in aviation, manufacturing and distribution, occupies a strategic position to the west of Ireland, is a centre of international business, has strong synergies with Limerick City, Ennis and the wider Region and is central to delivering the ambition for the Limerick-Shannon Metropolitan Area's economic, social diversity and tourism development.

There are three service towns within Clare, Kilrush, Ennistymon/ Lahinch and Scarriff/ Tuamgraney, which have been designated for their role as an important service centre and driver of growth. To the lower end of the settlement hierarchy are small towns, large villages, small villages, clusters and then the countryside.

Clare forms an area of some 324,000 hectares. A large proportion of the county boundary is comprised of Atlantic coastline, with the Shannon Estuary, which is located on the southern boundary forming the largest estuarine complex in Ireland. Clare has a varied morphology, ranging from steep coastal cliffs to estuaries and limestone pavement, the latter of which is home to the Burren - an important scenic landscape and tourist attraction. The study area for the RES comprises the entire county of Clare, including its coastline and adjacent waters.



2.3 Strategic Environmental Assessment (SEA)

SEA is a process for evaluating, at the earliest appropriate stage, the environmental consequences of implementing plan/programme initiatives prepared by authorities at a national, regional or local level or which are prepared by an authority for adoption through legislative means. The purpose is to ensure that the environmental consequences of plans and programmes are assessed both during their preparation and prior to adoption. The SEA process also gives interested parties an opportunity to comment on the environmental impacts of the proposed plan or programme and to be kept informed during the decision-making process.

The European Directive (2001/42/EC) on the Assessment of the Effects of Certain Plans and Programmes on the Environment (the SEA Directive), was transposed into national legislation in Ireland by the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435/2004) and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. 436/2004), as amended.

Under Article 3(2) of the Directive, an environmental assessment shall be carried out for plans and programmes, and those related to energy. CCC undertook SEA Screening in 2020 and determined that SEA of the new RES would be required under S.I. 435/2004 (as amended); see also **Section 4.2**. RPS undertook scoping with statutory consultees in March 2021 to define of the scope and level of detail of the information to be included in the Environmental Report.

Figure 2.3-1 shows the key steps required to complete the statutory SEA process in accordance with the relevant national legislation.

Figure 2.3-1: Overview of SEA Process



2.4 Habitat Directive Assessment

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as “The Habitats Directive”, provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (AA):

Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

The Habitats Directive is implemented in Ireland by the European Communities (Natural Habitats) Regulations (SI 94/1997), which has been replaced by European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011). This Birds and Natural Habitats Regulations 2011 consolidate the Natural Habitats Regulations 1997 to 2005 and the Birds and Natural Habitats (Control of Recreational Activities) Regulations 2010.

3 DESCRIPTION OF THE RENEWABLE ENERGY STRATEGY (RES) (2022)

3.1 Introduction

The Clare County Renewable Energy Strategy 2023-2030 outlines the renewable energy resource that is deliverable in County Clare. Its vision, consistent with that of the Clare County Development Plan 2023-2029, where it is an objective of the Plan position the County as:

The national leader in renewable energy generation which supports energy efficiency and conservation, and which achieves balanced social and economic development throughout the County and assists in achieving Ireland's Green Energy target.

Table 3.1.1 below sets out the renewable energy resource targets for County Clare by 2030. It indicates that a sustainable balance of renewable energy resources is planned, ensuring that there is no over reliance or over concentration on any single technology. Details of the technologies are contained within the RES.

Table 3.1.1: Renewable Energy Resource Targets for County Clare

Chapter	Renewable Energy Resource Accessible - Planned	County Clare	
		GWh/y	MW
Thermal			
6	Forest wood fuel & Wood Process by-product	128.3	29.3
6	Energy Crop (SRC-Miscanthus)	175.0	39.9
7	Geothermal	34.0	15.0
6,7	Micro-Thermal	175.7	92.8
Sub Total		513.0	177.0
AD-CHP*thermal			
12	AD - Grass Silage	20.1	2.5
12	AD - Animal wastes	15.8	2.0
12	Municipal Organic MSW	25.1	3.2
6	Micro CHP	2.0	0.5
6,13	Biomass CHP	460.0	58.3
Sub Total		523.0	66.6
Electric			
9	Onshore wind	1,590.0	550.0
10	Offshore wind	27.3	10.0
11	Hydro	468.0	89.0
10	Wave	59.1	20.4
10	Tidal	66.1	20.0
5	Micro Generation - electricity	7.2	2.1
5,6,13	CHP electric	261.5	29.2
Sub Total		2,479.2	720.8
15	Transport	14.0	2.0
Overall Total Renewable Target		3,529.2	966.4

Note:

Targets are not caps and are not intended to limit the potential for creation of renewable energy. Targets may be carried forward into subsequent renewable energy strategies if they have not been met within the lifetime of this strategy. It is not a requirement that targets for particular renewable energy technologies will be met by a single project.

The Draft RES acknowledges that Clare has the natural resources needed to maximise energy generation by renewable means. Its geographical location on the Shannon Estuary and its Atlantic coastline, coupled with a strong wind resource, undulating topography and a significant grid network, present opportunities for both on-shore and off-shore wind, wave and tidal energy, and pumped freshwater hydro energy storage. County Clare is also ideally placed to maximise the potential of bio-energy – a strong woodland resource combined with significant heat demand centres at Ennis, Shannon and Kilrush, provide a viable opportunity for combined heat and power technology in particular.

It acknowledges the significant contribution such renewables can make to County Clare, becoming more energy secure and less reliant on traditional fossil fuels, thus enabling future energy export and meeting assigned targets. The Draft RES also recognises the importance of the infrastructure in County Clare including road, electricity, gas and broadband networks, airport, ports and the Shannon Estuary, both in supporting the development of renewables and enabling a competitive supply chain economy.

The Draft RES provides the necessary framework to maximise the County's renewable energy potential and to assist it in becoming an energy secure, low carbon county, to meet renewable energy targets, with the potential to export excess energy. This Renewable Energy Strategy aims to ensure that County Clare is an exemplar in promoting and facilitating renewable energy generation. The RES sets out clear objectives and targets for the above technologies and provide a development management framework that enables County Clare to position itself as a front runner in facilitating appropriately located and sustainable renewable energy technology. The Strategy sets out the Council's objectives until 2030, a key date for Ireland to meet assigned national and European targets for renewable energy generation.

The RES provides a valuable tool for future investors by setting out clear Council policy in relation to renewable energy generation in County Clare – type, location, parameters, key planning issues etc. – and provides a comprehensive suite of data relating to the County's natural resources, including off-shore wind, geothermal, solar, tidal etc. The Strategy also informs and assists the development management process in the assessment of renewable energy proposals.

The Draft RES acknowledges the objectives of the existing WES for County Clare which will form part of the CDP 2023-2029. However in line with Government Circular Letter PL 20-13 and PI 5/2017) it is not proposed to make any changes to the WES until the Draft revised Wind Energy Development Guidelines of December 2019 (published by the then-named DHPLG) are finalised. The Draft RES provides a summary of its key objectives, which are referenced for the purposes of completeness and are stated as fact in so far as they have already been adopted. The RES includes additional policies to ensure protection of the environment from cumulative effects associate within wind energy developments and capacity issues associated with for example landuse, landscape, etc.

The overarching aim of the RES is to support and facilitate Ireland in meeting the current National Renewable Energy Action Plan (NREAP) required under Article 4 of Directive 2009/28/EC on Renewable Energy. This outlines binding targets for Renewable Energy in Electricity, Heat and Transport. **Table 3.1.2** below presents current targets across electricity, heat and transport sectors, following the 'With Additional Measures' projection set out in the national Energy and Climate Action Plan 2020-2030

Table 3.1.2: National Renewable Energy Targets

RES Target	Ireland 2019 (%)	Target 2020 (%)	Target 2030 (%) ²
Overall RES Target	12	16	34.1
RES-E	36.5	40	70 ³
RES-H	6.3	12	24
RES-T	8.9	10	13.4

² National Energy and Climate Plan 2021-2030 .Table 5. [Accessed 22/02/2021]

³ Note - The Climate Action Plan 2021 increased the ambition of Ireland's renewable electricity targets from 70% in the previous CAP 2019 to 80%.

The RES recognises that County Clare has substantial renewable energy resources and the RES seeks to maximise this potential where appropriate. The RES recognises that the capacity to harness those resources and generate energy will need to be balanced with other considerations, including:

- **Community Acceptance of Energy Infrastructure**
Key issues include community consultation at an early stage, raising awareness of renewable energy and linking to health, wellbeing and social and economic development.
- **Ecological and Environmental Impact**
Impacts on designated sites, flora, fauna, air, water, soil, peat etc. Requirements of Strategic Environmental Assessment, Appropriate Assessment, Water Framework Directive.
- **Energy Infrastructure Capacity / Development**
Capacity of the grid to accept the levels of electricity capable of being generated by renewable means; requirement for close liaison with EirGrid in regard to Grid 25 Strategy, project proximity to grid connection
- **Landscape Characteristics**
Issues surrounding established landscape character and potential impacts thereon, landscape impact, visual impact, mitigation, cumulative issues, e.g. with wind farms.
- **Land Use Change**
Linked to landscape also, a growing demand for fuel to serve the renewable energy industry (e.g. woodland and energy crops as biomass) may change agricultural practices and create new demands on rural areas.
- **Economic Impact and Job Creation**
Increased up take of new renewable energy technologies can support job creation and further economic activity.

4 METHODOLOGY

4.1 Introduction

The SEA Directive requires that certain Plans, Programmes, which are likely to have a significant impact on the environment, be subject to the SEA process. The SEA process is broadly comprised of the steps listed in **Table 4.1.1**.

An SEA on the Draft Renewable Energy Strategy (Draft RES) first commenced with the issuance of a Scoping Document to the statutory consultees in March 2021, under the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435/2004), as amended by S.I. 200/2011.

Table 4.1.1: Steps of the SEA Process

SEA Step / Stage	Purpose	Status
Screening	Decision on whether or not an SEA required.	Clare County Council undertook screening of the RES which forms part of the CDP 2023-2029 in September 2020 and determined that SEA of the RES would be required in accordance with S.I. 435 of 2004 as amended by S.I. 200 of 2011.
Scoping and Statutory Consultation	Consultation with the defined statutory bodies on the scope and level of detail to be considered in the assessment.	This stage was completed from February to May 2021. First Scoping Document issued March 2021
Environmental Assessment and Consultation	The purpose of this stage of the process was to assess the likely significant impacts on the environment as a result of implementation of the draft RES and consideration of reasonable alternatives. The output from this stage of the process is an SEA ER which records this assessment. Consultation on the draft RES and ER are also part of this stage.	This Stage is underway.
SEA Statement	Identification of how environmental considerations and consultation have been integrated into the final Proposed RES culminating in the production of an SEA Statement.	To be published with final RES in April 2023.

4.2 Screening

The SEA Directive requires that certain plans and programmes, prepared by statutory bodies, which are likely to have a significant impact on the environmental, be subject to the SEA process. An SEA screening of the CDP (including the RES) was undertaken by Clare County Council in 2020 after which it was concluded that SEA would be required.

4.3 Scoping

Under Article 6 of the SEA Directive, the competent authority preparing the plan or programme is required to consult with specific 'environmental authorities' (statutory consultees) on the scope and level of detail of the information to be included in the ER.

A Draft SEA Scoping Report was initially published for statutory consultees as listed in **Table 4.3.1** in April 2021 for 4 weeks (4th May 2021 deadline for response to scoping report).

Table 4.3.1: Statutory Consultees for SEA⁴

SEA Consultee
Environmental Protection Agency
Department of Housing, Local Government and Heritage
Minister for the Department of Communications, Climate Action and Environment (<i>formerly DCENR</i>)
Minister for the Department of Agriculture, Food and the Marine (DAFM)

In addition to the above the following adjoining Local Authorities will also be notified:

- Limerick City and County Council;
- Galway City and County Council;
- Kerry County Council; and
- Tipperary County Council

A copy of the scoping report will also be issued to the Southern Regional Assembly.

4.3.1 Consultation Feedback

Draft Scoping Report

Table 4.3.2: Summary of Key Issues

SEA Consultee	Summary of Key Issues
Environmental Protection Agency	<p>SEA should take into account Sustainable Development Goals and key actions for Ireland set out in the State of the Environment Report (2020).</p> <p>Key issues and challenges described in our Ireland's Environment – An Integrated Assessment 2020 Report (EPA, 2020) should be taken into account, where relevant.</p> <p>Of particular relevant to the RES includes:</p> <ul style="list-style-type: none"> • Reduce human induced pressures on the marine environment. • Move away rapidly from extensive use of fossil fuels to the use of clean energy systems • Systemic change is needed for Ireland to become climate neutral and a climate resilient society and economy. • WHO clean air quality guideline values to be adopted within the Clear Air Strategy as specific targets to achieve <p>The relevant objectives and policy commitments of the National Planning Framework and the Regional Spatial and Economic Strategy for the Southern Region should be aligned with and considered.</p> <p>Ensure the RES aligns with national commitments on climate change mitigation and adaptation, as well as any relevant sectoral, regional and local adaptation plans.</p> <p>Where it is envisaged that measures proposed in the Strategy will be implemented via other plans, which themselves have been or will be subject to SEA, this should be explained in the Environmental Report, and taken into account in the assessment.</p> <p>Where specific measures will be implemented directly, further detail should be provided in the Environmental Report and Strategy on the relevant environmental assessments to be carried out at the project stage and relevant mitigation measures to be applied, as appropriate. There may be merit in exploring this issue further with the</p>

⁴ Note – the table reflects the naming of department at the time of consultation.

SEA Consultee	Summary of Key Issues
	<p>relevant Environmental Authorities during the Strategy preparation and SEA processes</p> <p>All recommendations from the SEA and AA processes, including mitigation measures, should be integrated in the Strategy. RES should include summary tables outlining the key findings of the SEA and linking the significant environmental effects identified and the proposed mitigation measures, monitoring programme and strategy policies/measures.</p> <p>The RES should include a commitment to implement the environmental monitoring programme and associated reporting. A separate section on '<i>Monitoring, Review and Reporting</i>' in the RES is recommended.</p> <p>Specific to the scoping report the EPA noted that the following additional plans should be considered:</p> <ul style="list-style-type: none"> • National River Basin Management Plan for Ireland 2018-2021 • National Air Pollution Control Plan • The Effort Sharing Regulation for 2030 (Regulation 2018/842) • The Climate and Energy Governance Regulation (2018/1999) • LULUCF Regulation (Regulation 2018/841) • Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025 (in preparation). <p>The proposed 'green energy hub' at Moneypoint should also be considered in preparing the Strategy and associated SEA.</p> <p>In Figure 4-1 of the Scoping Report, consider removing the reference to the "River Basin Management Plans", as they have been amalgamated into the National River Basin Management Plan.</p> <p>Recommend including new objective with a commitment to environmentally sustainable development of RES.</p> <p>Objective B4 should be updated to refer to the National River Basin Management Plan. Consider reference to Local Catchment Assessments to inform achieve local water quality issues within specific sub catchments.</p> <p>The need to consider the capacity of an area to absorb further RE developments and also within the context of protecting wider environmental protection within and adjacent to the county. This is important to ensure that the recognised decline in nature is considered in preparing and implementing the Strategy.</p> <p>The existing environmental pressures described in our State of the Environment Report, should be considered as appropriate and relevant to the Strategy and SEA.</p> <p>The EPA's Good Practice Guidance Note for Strategic Environmental Assessment for the Energy Sector (EPA, 2021) should be referred to.</p> <p>The SEA should consider aspects such as slope instability / soil erosion as part of the assessment. Where available, the assessment should incorporate slope stability mapping and groundcover assessment in the context of potential cumulative effects arising from multiple developments.</p> <p>The potential implications of climate change to impact on increased risk of slope instability should also be considered, where appropriate.</p> <p>EPA Research 39:Civic: Critical Infrastructure Vulnerability to Climate Change maybe useful to considered, in terms of aspects related to energy infrastructure and climate change related implications, setting out the provisions for monitoring and reporting on the implementation of the Strategy and periodic reviews. There may be merits in aligning the periodic reviews of the Strategy with existing cyclical reporting e.g. <i>Ireland's Environment</i>, National Planning Framework, Water Framework Directive, Marine Strategy Framework Directive, etc.</p> <p>Recommends to align the Strategy implementation monitoring/reporting with the environmental monitoring required under the SEA legislation. Doing so would enable the environmental performance of the Strategy to be evaluated and would also provide for increased transparency during implementation.</p> <p>SEA monitoring should address positive, negative and cumulative effects where they are likely to occur and should include provision for on-going review to facilitate an early response to any environmental issues that may arise. Monitoring frequency and responsibilities and include provisions for reporting on monitoring.</p>

SEA Consultee	Summary of Key Issues
	<p>To avoid duplication in data collection, the same indicators should be used for the Strategy-related and SEA-related monitoring where possible.</p> <p>Use of schematics is recommended in illustrating integration of the RES with other plans.</p> <p>The Strategy should include measures to promote the implementation of adequate and appropriate drainage systems, where the construction of roads/infrastructure is required to service renewable energy developments.</p> <p>SEA should consider the extent to which options can be informed by maturity of the different technologies available. This might help in finalising options considered and in understanding the potential environmental impacts associated with these technologies.</p>
Department of Housing, Local Government and Heritage	<p>Noted concerns of the RES (and the WES) on threats to NHAs.</p> <p>Recommended that the following policies/plans be referenced:</p> <ul style="list-style-type: none"> • EU Biodiversity Strategy for 2030 • Status of EU Protected Habitats and Species in Ireland (2019) • National Peatlands Strategy 2015-2025 • Wildlife Acts, 1976-2018 <p>Consideration of Marine Protection Areas (MPAs) should be considered in the SEA.</p> <p>Consideration of the Birds Directive should be included in the Strategic Objectives along with the Habitats Directive (p19 – 4.1 (b)).</p> <p>Opportunities for research to ensure that the calculation of carbon budgets includes the alternative options of peatland restoration for renewable energy projects should be considered within the RES and SEA.</p> <p>The following data sources (Table 5.1 of Scoping Report) should also be included:</p> <ul style="list-style-type: none"> • Bat Conservation Ireland • Raptor Study • BirdWatch Ireland • Irish Raptor Study Group, • Golden Eagle Trust • Copernicus - Coastal Zone Land Cover Land Use product • Other information may be made available from OPW datasets for river systems and the ESB for bird collision data on powerlines <p>Further baseline information and data should be available from Clare Co. Co. ((e.g. county or sub-county habitat maps, wetland surveys, hedgerow surveys, Environmental Impact Statements and other assessments of plans and projects within the plan area, Environmental Monitoring Reports required as condition of some consented projects e.g. windfarms). The development of ecological connectivity mapping and associated ArcGIS tools by Clare Co. Co. should also be referenced.</p> <p>Once available the new national land cover database from OSI/EPA should replace CORINE.</p> <p>In Table 5.2 the general the key elements of biodiversity, flora and fauna of relevance to SEA include the following: European sites, including:</p> <ul style="list-style-type: none"> • Special Areas of Conservation and Special Protection Areas; • Natural Heritage Areas (NHA) and Proposed Natural Heritage Areas (pNHAs); • Nature Reserves (Ballyteigue, Caher (Murphy), Coole Park and Keehilla (Slieve Carron)); • Marine Protected Areas; • Refuges for Fauna or Flora; • Wetlands of International Importance under the Ramsar Convention; • Wildfowl Sanctuaries; • The Burren National Park; • UNESCO Biosphere Reserves; • Biogenetic Reserves;

SEA Consultee	Summary of Key Issues
	<ul style="list-style-type: none"> • World Heritage Sites designated for biodiversity reasons; • Annex IV (Habitats Directive) species of flora and fauna, and their key habitats • Species of flora and fauna and their key habitats protected under the Wildlife Acts, 1976-2018, and species protected under the Flora Protection Order; • Birds Directive – Annex I species and other regularly occurring migratory species and their habitats including ‘Protected species and natural habitats’; • Habitats Directive – Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places including ‘Protected species and natural habitats’; • Stepping stones and ecological corridors including nature conservation sites (other than European sites), habitat areas and species’ locations covered by Article 10 of the Habitats Directive; • <i>Margaritifera</i> Sensitive Areas’; • Areas recognised as locally important for biodiversity or nature (e.g. in County Biodiversity and/or Development Plans; • Areas that are considered to be of “high nature value” (e.g. farmland identified as “high nature value farmland”); • Watercourses, surface water bodies and associated wetlands, including floodplains and flood risk areas; • Other sites that may be of high biodiversity value, high nature value or ecological significance; • Ecological mitigation and compensation measures arising from existing plans and programmes; and • Outputs of relevant monitoring programmes that inform understanding of the current environmental condition. <p>In Table 5.3 of the scoping report interrelationships between Biodiversity and Cultural Heritage as well as Biodiversity and Landscape should be considered (e.g. Bat roosts in protected structures). The considerations of this matrix table are unclear as to why Biodiversity is not on the vertical axis.</p> <p>In Table 5.4 of the scoping report the following environmental pressures on biodiversity should be considered:</p> <ul style="list-style-type: none"> • Permanent and/or temporary habitat loss Permanent and/or temporary habitat fragmentation • Habitat deterioration • Vegetation or community changes (e.g. from land use change as well as direct changes to the environment, e.g. through emissions, fertilisation, lighting etc.) • Changes to soil nutrient status • Changes to physical structure of habitats (e.g. creeks and pans in salt meadows) Disturbance or damage to breeding, roosting, feeding areas • Changes to distribution of species • Introduction or expansion of barriers to movement, dispersal, migration • Introduction or increase of collision risk • Other impacts that may affect productivity and breeding success • Changes to water quality, such as eutrophication, sedimentation etc. • Changes to natural processes of sedimentation and erosion • Changes to drainage, hydrology, hydromorphology, sub-surface flows, flooding regimes, etc. • Changes to ecosystem services and functions, such as pollination, water attenuation and flood mitigation, climate change mitigation and adaption (such as carbon storage and sinks etc.) • Introduction or spread of invasive species. <p>Draft Biodiversity Targets (Table 7.1 of the Scoping Report) should include biodiversity enhancement opportunities and natural water retention measures which can be included and quantified within the monitoring regime.</p>

SEA Consultee	Summary of Key Issues
	<p>The Department would also welcome a clear and specific monitoring plan to be included with the SEA that would clearly outline how it is proposed to record the impacts of plan implementation on biodiversity, both in terms of biodiversity loss and biodiversity enhancement during the lifetime of the plan. The Department would also welcome the publishing of such reports.</p>
Department of Environment, Climate and Communications (DECC) Geological Survey Ireland (GSI)	<p>Geological Survey of Ireland (GSI)</p> <p>List of relevant data sets, mapping and link to website provided.</p> <p>Noted that GSI recognise the significant potential of Irish geothermal energy resources to decarbonise the heat energy sector and welcomes the inclusion of geothermal in the early stage to the RES.</p> <p>Provided correct definition of Geothermal Energy to be utilised in the ER and link to information on geothermal energy in Ireland.</p> <p>Noted that in some cases better groundwater supplies can often be found in karst areas, making them more suitable for geothermal boreholes and open-loop GSHPs. Reference document provided- Homeowner's Guide to shallow geothermal energy GeothermalHomeownerManual.pdf (gsi.ie). This was in response to an incorrect ref in Scoping Report which stated: <i>"Geothermal energy developments need to be located away from karst areas or where there is an existing high groundwater vulnerability rating and a shallow soil profile (which are unable to accommodate subsurface structures). Developments should also be located away from significant peat or bog areas"</i>.</p> <p>Noted that areas with high groundwater vulnerability and shallow soils may be unsuitable for a range of land activities and subsurface infrastructures related to other renewable technologies (e.g., wind turbines, solar farms, etc.), depending upon site specific conditions.</p> <p>Referred to the Assessment of Geothermal Resources for District heating in Ireland and the Roadmap for a Policy and Regulatory framework for Geothermal Energy in Ireland documents which should be addressed in the ER.</p> <p>Referred to geothermal suitability mapping to determine the most suitable type of ground source heat collector for use with heat pump technologies. Ireland also has recognised potential for deep geothermal resources.</p> <p>Recommended taking geohazards, landslide vulnerability and groundwater flooding on board when developing areas or assessing risk/constraints for RE development.</p> <p>The Plan should ensure sustainable use of natural resources.</p> <p>The consideration of mineral resources and potential resources as a material asset which should be explicitly recognised within the environmental assessment process.</p> <p>The critical raw material demands of emerging renewable energy solutions should be considered, with a particular emphasis on the overall environmental footprint of their production.</p> <p>The potential to contribute to Ireland's secure and sustainable supply of raw materials essential for the green transition should be incorporated into the overall renewable energy strategy of the area.</p> <p>Recommended the use of INFOMAR's suite of mapping and CHERISH (Climate, Heritage and Environments of Reefs, Islands, and Headlands) mapping for use with any future marine renewable projects.</p>
Department of Agriculture, Food and the Marine (DAFM)	<p>Recommended including the Common Fisheries Policy as it sets out legislation for sustainable commercial fishing in European waters.</p> <p>Thus providing for the continued economic viability of fishing fleets and fish processing, while supporting the communities that depend on a vibrant fishing industry.</p> <p>SEA to address the potential impacts of offshore RE during the planning/proposal process and during the development process on the long standing, pre-existing and traditional activity of commercial sea fishing.</p> <p>Recommends early engagement with fishing industry and other relevant stakeholders as early as possible, and at every stage of any planning/proposal process and during the process itself to discuss any changes that may affect them to afford a chance for their input</p>

SEA Consultee	Summary of Key Issues
	<p>Fishers' interests, access to fishing grounds, and livelihoods must be fully recognised and taken into account.</p> <p>Fisheries should be included as a material asset in waters off County Clare and impacts on such a material asset should be minimal.</p>
Inland Fisheries Ireland (IFI)	<p>Any consideration of hydroelectric generation be it run of river or storage based must consider both the flow regime change in the river and the potential for the entrainment of fish in any associated machinery.</p> <p>Requirements of IFI of Department of Communications, Energy and Natural Resources on the Planning, Design, Construction & Operation of Small-Scale Hydro-Electric Schemes and Fisheries to be followed.</p> <p>Specific reference in relation to flow protection and the prevention of loss of fisheries habitat in depleted reaches.</p> <p>IFI noted they are fully supportive of a move to more renewable form of electricity generation once consideration of aquatic and riparian habitat is central to any proposed RE project.</p> <p>In the context of the WFD the hydro-morphology of the rivers of County Clare and any existing barriers to the free movement of fish should be considered in terms of their sensitivity to any further pressures from renewable energy schemes. The noise sensitivity of estuarine fish (particularly the Clupeidae such as Shad and Herring) should be assessed alongside marine mammals in any consideration of the noise impact of underwater construction activity. Noise or vibration acting as a deterrent to fish occupation or migration through an area should also be considered.</p> <p>In response to the objectives and targets presented IFI stated that in line with the WFD which aims to restore waters to good status, the target should be for improvement only. The aim of 'no deterioration' is not in line with the goals of WFD.</p> <p>Agreed with the alternatives presented and the approach</p>

No responses were received from the adjoining local authorities or the Southern Regional Assembly.

4.3.2 SEA Workshop/Meetings

A teams meeting was held with representatives from the NPWS on the 22nd of June 2021. Key items that were discussed relevant to SEA of the RES included:

- Objectives and wording of objectives;
- Capacity of the landscape to accommodate further onshore windfarms;
- Monitoring of mitigation measures, positive and negative effects, setting indicators and targets for intervention and responsibility.
- Providing any CCC monitoring results to the NPWS.
- Ensuring the implementation of nature based solutions.
- Protection of ecological corridors during any greenway developments.
- Tourism and pressure on coastal sites.

Defining the Scope

The following table outlines the scope for the Environmental Report.

Table 4.3.3: Defining the Scope of the Proposed RES

Geographic Scope	The geographical extent of the RES includes the administrative area of County Clare (Figure 2.2-1) and marine waters. Therefore, the geographical scope of the SEA will, in the main, be focussed on this area though geographical areas, which are contiguous with the boundary, may be considered depending on the impacts identified for each issue area. Chapter 9 of this report provides details on the potential cumulative impacts of key environmental receptors from a strategic planning perspective. Given the potential for offshore renewable projects associated with the RES impacts on transitional and marine waters have also been factored into the assessment.
Temporal Scope	The Draft RES will cover the period 2022 to 2030. In line with the SEA Directive, short, medium and long term impacts must be considered during the assessment.
Level of Detail of the Proposed RES	The level of detail of the ER is determined by the content and level of detail of the Proposed Renewable Energy Strategy. The Proposed RES is a sub-regional planning document and is strategic in nature and therefore the majority of the data relates to this overall county performance.
Level of Detail of the Assessment	The assessment will be at a sub-regional level reflecting the position of the Proposed RES to the CCDP in the planning hierarchy.
Assessment Parameters	Cumulative/synergistic and secondary, permanent and temporary effects will be assessed along with direct and indirect impacts. Short, medium and long-term impacts will also be assessed.
Scoping of the SEA Topics	The following environmental topics, listed in the SEA Directive and associated regulations have been scoped in for the assessment of the Proposed Variation. These are biodiversity, Flora and Fauna, Population/ Human Health, Water, Landscape/Seascape, Soil/ Geology, Climatic Factors/ Air, Material Assets and Cultural, Architectural and Archaeological Heritage.

4.4 Environmental Assessment

4.4.1 Assessment Approach

SEA is, as its name suggests, set at a strategic level therefore it is not possible for the baseline environment to be described (and assessed) in as much detail as could be done for a project-level environmental impact assessment. Instead, SEA uses a system of objectives, targets and indicators to rationalise information for the purposes of assessment.

In order to streamline the assessment process, this report has used broad themes, based on the environmental topics listed in the SEA Directive, to group large environmental datasets e.g. human health, cultural heritage and climate. Assigned to each of these themes is at least one high-level Strategic Environmental Objective (SEO) that specifies a desired direction for change, e.g. reduce CO₂ emissions, against which the future impacts of the NPF can be measured. These high-level SEOs are then paired with specific targets. The progress towards achieving these specific targets is monitored using environmental indicators, which are measures of identified variables over time. The environmental assessment includes a combination of qualitative and quantitative assessment and expert judgement. **Table 4.4.1** outlines the type of assessment that has been carried out.

Table 4.4.1: SEA Environmental Assessment

Environmental Assessment	Is it Quantifiable?
Biodiversity, Flora and Fauna	National and regional datasets are available for aspects relating to biodiversity, flora and fauna. Given the scale of the RES, the assessment has considered all nature conservation sites, including European sites protected under national legislation, National Parks, Refuges for Fauna etc. Where available data sources from Clare County Council are used i.e. invasive species records, habitats mapping etc
Population and Human Health	National datasets are available for population density and distribution and the potential impacts of the RES can be assessed qualitatively relative to the available information. Human health considerations are being considered quantitatively within the spatial analysis to identify potential areas for large scale RE development

Environmental Assessment	Is it Quantifiable?
	through integration of the setback distances as utilised in the Wind Energy Development Guidelines or other guidelines as appropriate. Health impacts would primarily be secondary via emissions to air, water, soil, etc. during the construction phase of RES projects, as well as indirect impacts during the operation phase, for instance from noise and shadow flicker.
Soils	National high-level datasets are available for soils, geology, slope stability, groundwater vulnerability and land use resources at a county/ national scale. This is in keeping with the strategic nature of the RES and is considered adequate at this scale.
Water	National, regional and county datasets are available for aspects relating to water bodies and water quality, flood extents, as well as protected areas such as nutrient salmonid water bodies, sensitive waters etc. It is noted that there is an absence of location-specific information therefore assessment is focussed on qualitative however some quantification possible within the spatially-identified areas.
Air Quality	National and regional datasets are available for relevant air quality parameters.
Climatic Factors	National datasets are available for carbon emissions and other transboundary gas emissions. Regional emissions data in GIS by 1x1km grid square is also available.
Material Assets	National datasets are available for certain resources that may be affected by the RES including existing and planned RE development, electricity and grid infrastructure. Good quantitative information exists for number of developments and capacities.
Architectural, Archaeological & Cultural Heritage	National datasets are available for archaeology and architectural heritage, however the nature of the datasets are directed towards local project-specific sources. All heritage features are afforded protection in Ireland and the level and significance of impacts can vary widely depending on the type of feature and its historic/heritage setting, as well as landscape and visual interactions.
Landscape	There are no national datasets available for landscape and the information that is available at a county level is not consistent across all of the counties. However, new guidelines are available for the assessment of landscape and visual impacts; they aim to provide a more objective and structured approach, i.e., Guidelines for Landscape and Visual Impact Assessment, Third edition, Landscape Institute and Institute of Environmental Management and Assessment. Landscape and protected views designations as designated by Clare County Council have been referenced qualitatively.

4.4.2 SEA Environmental Report

This Environmental Report complies with the requirements of the Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive) as implemented in Ireland through the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations (S.I. No. 435 of 2004) and the Planning and Development (Strategic Environmental Assessment) Regulations 2004 (S.I. No. 436 of 2004), as amended. Based on the legislation and guidance, the Environmental Report must include the information outlined in Table 4.4.2.

Table 4.4.2: Requirements of the SEA Directive and Relevant Section in Environmental Report

Requirement of SEA Directive (Article 5(1) Annex I)	Chapter of ER
An outline of the contents and main objectives of the plan or programme, or modification to a plan or programme, and relationship with other relevant plans or programmes.	Chapter 2: Description of the Renewable Energy Strategy (RES) (2022) Chapter 6: Review of Relevant Plans and Programmes

Requirement of SEA Directive (Article 5(1) Annex I)	Chapter of ER
The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme, or modification to a plan or programme.	Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)
The environmental characteristics of areas likely to be significantly affected.	Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)
Any existing environmental problems which are relevant to the plan or programme, or modification to a plan or programme, including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to the Birds Directive or the Habitats Directive.	Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)
The environmental protection objectives, established at international, European Union or national level, which are relevant to the plan or programme, or modification to a plan or programme, and the way those objectives and any environmental considerations have been taken into account during its preparation.	Chapter 6: Review of Relevant Plans and Programmes Chapter 7: Objectives, Targets and Indicators
The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors.	Chapter 9: Assessment of Preferred Scenario Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)
The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme, or modification to a plan or programme.	Chapter 10: Mitigation and Monitoring
An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	Chapter 8: Alternatives
A description of the measures envisaged concerning monitoring of the significant environmental effects of implementation of the plan or programme, or modification to a plan or programme.	Chapter 10: Mitigation and Monitoring
A non-technical summary of the information provided under the above headings.	Non-technical Summary

4.4.3 Links between the SEA and AA Process

The Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) obliges member states to designate Special Areas of Conservation (SACs) to protect and conserve habitats and species of importance in a European Union context. Article 6 is one of the most important articles of the Habitats Directive in determining the relationship between conservation and site use. Article 6(3) requires that *“any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment (AA) of its implications for the site in view of the site’s conservation objectives.”*

The Habitats Directive has been transposed into Irish law by the Planning and Development Act (PDA) 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). An Appropriate Assessment (AA) is being carried on the wider CDP (including the RES) under the PDA (as amended).

Assessment and analyses in the NIR have been used to guide the development of the draft RES alternatives to be considered as part of the SEA. The NIR has also fed directly into the assessment of biodiversity, flora and fauna in this SEA.

Other aspects of the Habitats Directive, in addition to Art. 6(3) and 6(4), in relation to the conservation, protection and management of (European) sites are also noted including Art. 6(1) and Art 6(2). The EU considers the role of these supporting sub-articles in Art. 6 as: *Article 6(1) makes provision for the establishment of the necessary conservation measures, and is focused on positive*

and proactive interventions. Article 6(2) makes provision for avoidance of habitat deterioration and significant species disturbance. Its emphasis is therefore preventive.⁵

Article 10 of the Habitats Directive refers to features of the landscape outside designated sites which are of major importance for wild flora and fauna. It is noted that the requirements of Article 10 of the Habitats Directive are not specifically considered under the AA (except in so far as they support a qualifying feature) but it is noted such features have been considered in the SEA under the broader heading of Biodiversity, Flora and Fauna.

4.4.4 Difficulties Encountered

The following difficulties and data gaps were encountered in compiling the ER:

- Lack of quantitative data for some topics (e.g. health, regional carbon emissions data);
- While landscape character assessments (LCA) have been undertaken according to best practice to support the RES it is noted this has been done in the absence of a national or regional LCA;
- Lack of planning and development guidelines for utility-scale solar power (> 5MW); and
- Lack of national-scale data for environmental indicators such as birds and bats.

4.5 SEA Statement

The main purpose of the SEA Statement is to provide information on the decision-making process and to document how environmental considerations, i.e. the views of consultees and the recommendations of the ER, have been taken into account in the draft RES. The SEA Statement illustrates how decisions were taken, making the process more transparent. The SEA Statement for the draft RES will be compiled after the statutory consultation on the draft RES and ER has been completed.

4.6 Guidance and Legislation

4.6.1 SEA Guidance

The following principal sources of guidance will be used during the overall SEA process and during preparation of the ER:

- Good Practice Note on SEA for the Energy Sector, March 2021, Environmental Protection Agency.
- Good Practice Note on SEA for the Waste Sector, April 2019, Environmental Protection Agency.
- Strategic Environmental Assessment (SEA) Pack, February 2020, Environmental Protection Agency.
- Good practice note on Cumulative Effects Assessment, 2020, Environmental Protection Agency
- SEA Scoping Guidance Document, 2015, Environmental Protection Agency.
- SEA Spatial Information Sources Inventory, March 2020, Environmental Protection Agency.
- GISEA Manual – Improving the Evidence Base in SEA, 2017, Environmental Protection Agency.
- GISEA Manual, *Current Practice and Potential on The Application of Geographic Information Systems as A Support Tool in Strategic Environmental Assessment of Irish Land Use Plans* 2009. Environmental Protection Agency.
- Integrating Climate Change into Strategic Environmental Assessment in Ireland – A Guidance Note (Updated June 2019), 2019, Environmental Protection Agency.

⁵ European Commission (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the Habitats Directive 92/43/EC.

- Developing and Assessing Alternatives in Strategic Environmental Assessment – Good Practice Guidance, 2015, Environmental Protection Agency.
- Guidance on Strategic Environmental Assessment (SEA) Statements and Monitoring, April 2020, Environmental Protection Agency.
- Integrated Biodiversity Impact Assessment – Streamlining AA, SEA and EIA Processes: Practitioner’s Manual. EPA Strive Programme 2007-2013. Strive Report Series No. 106, (2013, Environmental Protection Agency).
- Strategic Environmental Assessment (SEA) Process Checklist - Consultation Draft, January 2008, Environmental Protection Agency (Updated September 2017).
- Development of Strategic Environmental Assessment (SEA) Methodologies for Plans and Programmes in Ireland. Synthesis Report. 2003. Environmental Protection Agency.
- Implementation of SEA Directive (2001/42/EC). Assessment of Certain Plans and Programmes on the Environment. Guidelines for Regional Planning Authorities. November 2004. Department of Environment, Heritage and Local Government.

4.6.2 Department Circulars

In addition, the then named Department of the Environment, Community and Local Government (now Housing, Planning and Local Government) has issued a number of relevant circulars in relation to SEA which will have relevance for the environmental assessment of the RES and will be taken into account during the course of the SEA. These circulars comprise:

- PSSP 6/2011: ‘Further Transposition of the EU Directive 2001/42/EC on Strategic Environmental Assessment (SEA)’; and
- Circular PL 9 of 2013: ‘Article 8 (Decision Making) of EU Directive 2001/42/EC on Strategic Environmental Assessment (SEA) as amended’.

4.6.3 Renewable Energy Strategy Guidelines

SEAI produced a methodology to act as a guide to assist local authorities in the preparation of their Local Authority Renewable Energy Strategies (LARES) entitled Methodology for Local Authority Renewable Energy Strategies (2013 SEAI). To guide the development of the methodology, SEAI convened a steering group with representation from the main groups that would be directly involved with the delivery and execution of LARES. The organisations represented on the steering group included the following:

- The Commission for Energy Regulation
- Department of Communications, Energy and Natural Resources
- Department of Environment, Community and Local Government
- EirGrid
- Irish Planning Institute
- Sustainable Energy Authority of Ireland
- Formerly Renewable Energy Information Office
- City and County Managers Association
- ESB Networks
- The Regional Planning Authorities
- National Parks and Wildlife Service
- School of Planning Dublin

The methodology of the report aims to facilitate a consistency of approach in the preparation of LARES and to assist local authorities in developing robust, co-ordinated and sustainable strategies in accordance with national and European obligations. The technologies covered in the LARES

Methodology include onshore wind, offshore wind, bioenergy, hydropower, solar energy, ocean energy and geothermal energy. Each has potential location, land-use, landscape and visual, site condition, operational and infrastructure considerations. It should be noted that land-use interactions are not homogenous across all development types and the list of interactions and renewable technologies is not exhaustive.

4.6.4 Climate Change

The SEA Directive provides plan-makers with a statutory framework to integrate climate-related policies/ objectives into plans and programmes. As part of the SEA process the EPA's Guidance Note 'Integrating Climate Change into Strategic Environmental Assessment in Ireland (2019)' will be taken into account. This guidance document states that the main climate change considerations to be taken into account as part of the Scoping Stage should include the following:

- Establish environmental (climatic) baseline;
- Develop climate change related Environmental Protection Objective(s);
- Consider if the plan is likely to have a significant effect on climatic factors;
- Set out an approach to ensure climate impacts are appropriately assessed;
- Identify environmental vulnerabilities possibly affected significantly by climate change;
- Consider adaptation and mitigation options to achieve the plan aims/goals;
- Early scoping consultation.

4.6.5 Others

- IFI of Department of Communications, Energy and Natural Resources on the Planning, Design, Construction & Operation of Small-Scale Hydro-Electric Schemes and Fisheries.

5 RELEVANT ASPECTS OF THE CURRENT STATE OF THE ENVIRONMENT (BASELINE)

5.1 Introduction

In line with the SEA Directive, an environmental baseline will be compiled for the RES. This will include: a description of the state of the environment at present; a discussion of the key problems/ issues currently being faced nationally; and a description of the expected evolution of the environment should the RES not be implemented.

The SEA ER will present a full description of the relevant aspects of the national environmental baseline data. The baseline will reflect the strategic and spatial aspects of the RES. The environmental baseline will be presented in the ER under a number of SEA topic headings as follows:

- Biodiversity, Flora and Fauna (BFF);
- Population and Human Health (PHH);
- Land and Soils (LS);
- Water (W);
- Air Quality (AQ);
- Climatic Factors (CF);
- Material Assets (MA);
- Architectural Archaeological and Cultural Heritage (CH); and
- Landscape (LandS).

Under each of the SEA topic headings, the current state of the environment will be identified along with the key problems/ issues and the expected evolution of the environment in the absence of the plan. The data sources that will be used to compile the current state of the environment are identified in Section 5.2.

5.2 Purpose of the Environmental Baseline

The purpose of presenting the environmental baseline as part of the SEA process as set out in this section is to:

- Support the process of assessing significant environmental effects;
- Support the identification of existing environmental problems/issues including gaps;
- Provide a baseline against which future monitoring programmes can be set up and data can be compared.

5.3 Environmental Inter-relationships

Recognising the inter-relationship between the different environmental parameters is critical in understanding an assessment of potential significant effects on the environment as the consequences of the proposals and objectives set out in the CCDP 2017-2023. Under each parameter, the inter-relationship with all other environmental parameters is set out.

5.4 SEA Recommendations

As part of the iterative process of SEA in the Plan making process, the presentation of baseline information, which will be used in the assessment of environmental effects of the policies and objectives of the Plan, does in itself highlight information and issues which should be incorporated within the Plan and where these arise, a recommendation(s)/mitigation will be included at the end of the baseline section for each environmental parameter in this regard. Full details on the SEA recommendations are outlined in **Chapter 10** of the ER.

5.5 State of the Environment Overview – Republic of Ireland

Ireland's natural environment, although under increasing pressure, generally remains of good quality and represents one of the country's most essential national assets (EPA, 2012, 2016 and 2020). However it is acknowledged that problems and challenges still remain. In the 7th and most recent state of the environment review Ireland's Environment – An Assessment 2020⁶, the EPA outlines a summary scorecard for the progress being made across key environmental policy areas as well as the general trend/outlook. These are summarised below in **Table 5.5.1**.

Table 5.5.1: Summary Assessment and Future Outlook for Selected Environmental Policy Areas and Relevance to the RES

Policy Area	Summary Assessment & Outlook	Relationship to the RES
Climate	<p>Assessment: Very poor / significant environmental and/or compliance challenges to address</p> <p>Outlook: Partially on track to achieving full compliance or measures in place or planned that will improve the situation</p> <p>Ireland has made good progress in deploying renewable energy sources and has an ambitious National Energy and Climate Plan, and Climate Action Plan. However Ireland continues to have a high level of greenhouse gas (GHG) emissions and remains above its EU emission limit, missing our target for 2020. Should all the actions in the Climate Action Plan be fully adopted and implemented, the targets for 2050 could be achieved. However significant challenges remain to reaching these goals.</p>	<p>The overarching goal of the RES is to optimise the opportunities in Clare for renewable electricity development in accordance with European and Irish law. The RES will set out strategies to achieve renewable energy/climate targets and also examines the spatial aspect in terms of identifying areas to accommodate RE development at scale. As part of this spatial analysis, environmental considerations have been built into the analysis such as those relating to biodiversity, protected habitats and species under European law, rivers, flooding, hydrogeology, land and soils, and material assets.</p> <p>In this regard, the draft RES has been developed with these considerations in mind from the outset to ensure guidance on RE development under the strategy is carried out in compliance with all existing EU and national objectives, policies and legislation which also seek to protect the natural environment.</p>
Air Quality & Emissions	<p>Assessment: Moderate / on track generally / local or occasional challenges</p> <p>Outlook: Partially on track to achieving full compliance or measures in place or planned that will improve the situation</p> <p>Air quality in Ireland is generally very good and consistently meets its EU limit values. There was however an exceedance in 2019 of nitrogen dioxide at a monitoring station in Dublin, and Ireland at times does not meet the more stringent limit values set by the WHO (namely of fine particulate matter). In terms of transboundary emissions, Ireland is failing to meet EU targets on ammonia emissions under the National Emissions Ceiling (NEC) Directive, of which agriculture is the main source. Progress is mixed progress in terms of reducing emissions from other sectors such as transport and energy. Measures at a national level are required to tackle this and improve the outlook.</p>	<p>The draft RES will help in improving air quality emissions during the operation stage by providing for more energy efficient and renewable energy technologies.</p> <p>Emissions during the construction phase of any RE facilities proposed within the draft Plan will be managed through the EIA and planning process.</p> <p>The draft RES supports the planning system and the approval process for implementing RE infrastructure and has policies which aim to avoid sensitive areas.</p>

⁶ EPA (2020) Ireland's Environment – An Assessment. Available at: <https://www.epa.ie/irelandsenvironment/stateoftheenvironmentreport/>

Policy Area	Summary Assessment & Outlook	Relationship to the RES
Water	<p>Assessment: Poor / environmental and/or compliance challenges to address</p> <p>Outlook: Partially on track to achieving full compliance or measures in place or planned that will improve the situation</p> <p>In general, trends in water quality are mixed; over the past 20 years, there has been a deterioration in the number of the highest quality water bodies, particularly rivers, and mixed progress in waters achieving the environmental objectives under the water Framework Directive (WFD). Good progress has been made in improving wastewater treatment however issues remain. Nutrient enrichment remains the main significant issue. The outlook is also mixed, and a balance needs to be sought between a growing population and certain sectors in particular, such as intensive agriculture.</p>	<p>Some water bodies are not meeting their WFD objectives largely due to nutrient enrichment. RE infrastructure has potential during the construction stage to impact on receiving groundwaters and surface waters through sediment run-off, inappropriate siting of infrastructure i.e. in karst areas.</p> <p>The draft RES supports the planning system and the approval process for implementing RE infrastructure and has policies which aim to avoid sensitive areas and protect watercourses.</p>
Nature	<p>Assessment: Very poor / significant environmental and/or compliance challenges to address</p> <p>Outlook: Largely not on track to meet policy objectives and targets.</p> <p>The assessment and outlook are overall very poor. Biodiversity losses and habitat changes continue on an international scale. EU conservation status reporting indicates generally declining trends and unfavourable status for many habitats, with 85% having unfavourable status. Many species are faring better, but 15% are in decline at EU level, mostly freshwater species. Agricultural activities remain the key pressure. The outlook is very poor, with climate change adding to challenges and cumulative impacts.</p>	<p>The draft RES has potential to impact on biodiversity through inappropriate siting of RE infrastructure, lack of assessment of potential impacts, fragmentation, habitat loss, etc.</p> <p>A key aim of the draft RES is to avoid impacts to sensitive sites.</p> <p>The draft RES supports the planning system and the approval process for implementing RE infrastructure and has policies which aim to avoid sensitive areas or assess impacts to Nature through the EIA and AA requirements and general environmental protection measures set out in Chapter 17.</p> <p>To also note the draft RES itself is undergoing SEA and AA in line with existing EU and national legislation. This will ensure that the broader environmental consequences are taken into account as part of the strategies development. Both processes are helping to shape the evolution of the draft RES.</p>
Waste & Circular Economy	<p>Assessment: Poor / environmental and/or compliance challenges to address</p> <p>Outlook: Partially on track to achieving full compliance or measures in place or planned that will improve the situation</p> <p>Ireland has made excellent progress in meeting its current EU targets. The generation of waste volumes however remains tied to economic activity which has been growing in recent years. Initiatives such as producer liability and waste prevention and recycling programs have also led to improvements and landfill needs have decreased while waste-to-energy capacity has increased. Challenges remain to shift from a linear economy to a circular one, with circular principles remaining low in Ireland.</p>	<p>The National Policy Position on climate action and low carbon development sets a fundamental national objective to achieve transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050. The draft RES is being prepared which gives direct consideration to this objective and the supporting legislation.</p> <p>The European Commission's European Green Deal (EGD) growth strategy aims for the EU to be climate neutral in 2050. Within the EGD the Commission has adopted a Circular Economy Action Plan for a cleaner and more competitive Europe which is addressed within the RES.</p>

Source: Ireland's Environment – An Assessment 2020. Adapted from Table 16.1.

In addition, thirteen key State of the Environment (SOE) messages that require vision and full implementation to be successful are outlined for Ireland in order to protect the environment, health, and wellbeing. These comprise:

- **SOE 1 – Environmental Policy Position:** The various links and dependencies between environmental policies and legislation could be reinforced, to lead to better overall environmental outcomes.
- **SOE 2 – Full Implementation:** There needs to be an improvement in tracking plans and policies, as well as compliance with several directives and legislation. Continued targeting of non-compliances by environmental enforcement bodies is needed, as is improving coordination across different bodies.
- **SOE 3 – Health & Wellbeing:** Recognition that protecting and maintaining a good quality environment is directly linked to health and wellbeing. Protecting the environment from pollutants is important, as is access to green and blue spaces.
- **SOE 4 – Climate:** The response to climate change needs to be accelerated - we urgently need to act to transform our energy systems in order to meet national, European and international decarbonisation goals, and to limit global temperature increases.
- **SOE 5 – Air Quality:** Adoption of the WHO's air quality guideline limits as part of Ireland's Clean Air Strategy. This strategy is needed to combat air pollution, as the WHO limits are more stringent than the values at European level. Integrating these measures along with noise mitigation and climate action are also key related measures.
- **SOE 6 – Nature:** Biodiversity networks and nature must be protected and safeguarded as a national priority. Habitat and biodiversity loss continue. It is considered that the next Biodiversity Action Plan should be more ambitious.
- **SOE 7 – Water Quality:** Water pollution needs to continue to be addressed both locally and at catchment level, particularly to address the key impact, which is primarily nutrients. Measures should continue to be implemented to achieve WFD protection objectives for all water bodies through evidence-based measures, projects and research.
- **SOE 8 – Marine:** The target should be to reduce anthropogenic pressures on the marine environment. Given Ireland's large marine area, one of the largest in continental Europe, robust governance and planning is needed to ensure its protection.
- **SOE 9 – Clean Energy:** Ireland needs to rapidly decarbonise and move away from fossil fuel combustion across heating, electricity and transport, to a suite of clean energy systems.
- **SOE 10 – Environmentally-Sustainable Agriculture:** A more integrated and holistic approach to farming alongside catchment-level water management is needed which reduces its environmental footprint, and moves towards carbon neutral food production.
- **SOE 11 – Water Services:** Water and wastewater systems need to meet the needs of society while providing for a high-level of environmental protection in terms of abstractions and treatment of water/wastewater. National-level action is needed to address priority areas and shortcomings, as well as consideration given to climate impacts and the resiliency of infrastructure.
- **SOE 12 – Circular Economy:** The move to climate-neutral circular economy is urgently needed to preserve resources, reduce consumption, and reduce waste at all levels of society.
- **SOE 13 – Land Use:** Moving towards an integrated land use mapping approach is needed to support better decision making and promoting a better understanding of environmental issues and allowing for consideration of competing land use interests (e.g. preserving carbon sinks, tourism, land use planning etc.).

A summary of the relevant aspects of the current state of the environment in Ireland, as presented in the *Ireland's Environment – An Assessment 2020* (EPA, 2020) has been provided in

Table 5.5.2. It should be noted this is intended to be general summary of the current environmental issues in Ireland across various sectors. It reflects the latest data referenced in that report, i.e., up to

2020. As far as possible, more detail and up to date information is documented in **Sections 5.5 – 5.13**.

Table 5.5.2: Summary of the EPA Current State of the Environment 2020

Theme	Key Findings
Water Quality	<p>Almost half of Ireland's surface water bodies (river, lake, transitional and coastal) are failing to meet their objectives under the WFD. For the water quality reporting period 2013-2018, just over half of Ireland's water bodies (53%) were at Good or High status ecological status. The remaining water bodies were at Moderate, Poor or Bad status. Most of Ireland's coastal water bodies are of Good ecological status or better (80%), followed by rivers (53%), lakes (50.5%) and estuaries (38%), which are the surface water bodies with the worst water quality. Only 16.5% (242 of 1,460) of At Risk water bodies achieved their WFD objectives.</p> <p>There continues to be a decline in the number of water bodies reaching or maintaining High ecological status, with only 20 sites reaching Q5 status compared to 500 30 years ago, and an increase in the number of the most polluted water bodies. A number of fish kills were also recorded; 40 in 2018 compared to a historic low of 14 in 2017; this is attributed to higher summer temperatures, low flow conditions and reduced ambient oxygen. This highlights that healthy water bodies are more resilient to the effects of climate change.</p> <p>In terms of chemical status in surface waters, while some ubiquitous priority substances (e.g. hydrocarbons) continue to be present in some water bodies, use of herbicides is widespread. Three-quarters of surface water bodies assessed for chemical status over the 2013-2018 period had Good chemical status. The majority of groundwaters (92%) have Good chemical status, and 99% have Good quantitative status i.e. rainfall replenishment of groundwater is generally able to sustainably support current abstraction volumes. The Cycle 2 RBMP flagged 6% of groundwater bodies as requiring further assessment for abstraction pressures. In 2019, the majority of bathing waters had good or excellent quality (97%) and five locations had poor bathing water quality.</p> <p>The key pressures on water bodies continues to be agriculture (nutrient run-off and sediment, point pressures such as farmyards), followed by hydromorphological issues (e.g. land drainage, channelisation), urban wastewater discharges and forestry, as well as other pressures. The key nutrients pressures are from phosphorus (the dominant nutrient of concern for surface waters) and nitrate (a particular problem in the south and south-east, as well as for groundwaters). Invasive or alien species remain a problem.</p> <p>The second cycle River Basin Management Plan (RBMP) and its Programme of Measures covers the period 2018-2021. The Third Cycle RBMP is underway and covers the period 2021-2027. The implementation and enforcement of the Nitrates Action Programme is the most important measure to address diffuse agricultural pollution of freshwaters. This includes a code of Good Agricultural Practice (GAP) which is mandatory for all farms. Other measures such as the Agricultural Sustainability Support and Advisory Programme, Agricultural Catchments Programme and the Blue Dot Programme. A suite of DAFM forestry policies and procedures, as well as the National Inspection Plan for domestic waste water systems, in addition to improvements to urban waste water discharges, are also key for tackling point and diffuse sources of pollution.</p>
The Marine Environment	<p>Ireland has one of the largest marine and MSFD assessment areas in Europe, at approx. 488,762 km². There is also an overlap between the waters under the WFD and the MSFD for one nautical mile from the high water mark. The latest MSFD assessment found that Ireland's coastal and marine waters are generally clean and healthy, but pressures persist, including from increasing development in marine waters. Under the WFD, 80% of coastal and 38% of transitional water bodies have achieved or maintained at least Good ecological status. Nutrient loading (namely of phosphorus and nitrogen) from freshwater sources to the marine environment have increased since 2012. However assessment of Ireland's marine waters shows the absence of eutrophication and have reached GES for this indicator.</p> <p>Under the MSFD, 11 qualitative descriptors are required for establishing Good Environmental Status (GES). Five are compatible with GES (D2 Non-indigenous species; D5 Eutrophication; D7 Hydrographical conditions; D8 Contaminants; and D9 Contaminants in seafood), two are compatible for the elements assessed (D10 marine litter and D11 Energy, including underwater noise), three have some elements compatible with GES (D1 Biodiversity; D3 Commercial fish and shellfish; and D6 Sea-floor integrity) and one is unknown (D4 Food webs).</p> <p>Under MSFD Descriptors 8 and 9, Ireland's initial assessment indicates contaminant concentrations in shellfish and commercial fish are elevated above background levels but</p>

Theme	Key Findings
	<p>not enough for significant adverse effects. For biodiversity, some marine fish and bird species are either threatened/vulnerable, or in poor condition; six of 58 cartilaginous fish are critically endangered. For non-commercial fish, 11 species are achieving GES, 18 are not and 23 species have unknown status. Of seabird populations, 17 of 20 monitored species have increased populations, two are stable and one has decreased. Numbers of some winter/migratory species on coastal/estuary sites are showing continued and increasing population declines. There is a current lack of long-term monitoring data for a number of cetacean species, but recent data indicates higher population numbers for some species than previously thought. Bycatch remains a pressure but for several species this does not appear to be impacting significantly on their populations. Grey and harbour seals are considered to have achieved GES.</p> <p>For Marine Protected Areas (MPAs), only 2.1% of Ireland's assessment area is designated as an MPA (which includes existing SACs). Ireland's Habitats Directive Article 17 Report (NPWS, 2019) indicates only five of the 23 coastal/marine habitats have favourable status. The key pressures are nearshore eutrophication, loss of key species (e.g. seagrass and maërl), anthropogenic impacts and invasive species.</p> <p>The key drivers of pressures and impacts arise from anthropogenic sources such as litter, climate change, noise and pollution events. Ocean warming and acidification are driven mainly by climate change. These pressures can exacerbate other issues such as impacting native biodiversity, facilitating expansion or spread of invasive or opportunistic species. Increased flows in rivers could also facilitate increased nutrient transport to the marine environment, combined with climate change, are expected to increase the risk of algal blooms.</p> <p>Marine litter affects ocean life and pollutes beaches, the water column and the seafloor. Dredging and dumping at sea is required for maintaining ports and navigational channels and is a licensable activity in Irish waters. Underwater noise is also increasing globally and related primarily to human activities (e.g. for drilling, extraction, navigation and data imaging purposes). Marine life is often sensitive to noise impacts, particularly whales and dolphins. Seaweed harvesting is another human activity which may impact on coastal biodiversity, particularly where large-scale commercial activity takes place.</p> <p>Commercial fisheries and aquaculture also place pressure on the marine environment through overfishing/discards of target species and bycatch of non-target species, disruption/destruction of habitats and species from trawling and dredging. Discharges of waste from fish farms is another issue, as is introduction of non-native species or pharmaceuticals for parasite control/anti-fouling agents. Escaped farmed species for instance may impact on the genetic integrity of wild stocks, and there are also landscape/seascape impacts from aquaculture gear. Irish fish stocks have declined due to overfishing and disturbance. Key aspects such as the locations/use of some nursery habitat/feeding areas remains poorly understood; 34 stocks (18%) achieved GES, 44 (22%) did not, with the status of 99 stocks unknown. Disturbance and impacts to seafloor habitats (e.g. from bottom trawl fishing gear) are widespread in Ireland's continental shelf area (46% of the assessed area is highly disturbed), but not all of the maritime area has been assessed.</p> <p>The key responses to tackling these marine issues are the United Nations Sustainable Development Goals (SDGs, particularly Goal 14, Life Below Water). The EU also identified priority actions for Ireland, with particular regard to MSFD implementation. Spatial planning plays a key role, taking the form of the National Marine Planning Framework, the publication of Ireland's first marine spatial planning policy, as well as the Marine Planning and Development Management Bill. Monitoring and assessment under the MSFD is ongoing. The Common Fisheries Policy (CFP) is also a key tool for managing fish quotas. The National Strategic Plan for Aquaculture was published in 2015, and is currently being updated. Climate change mitigation and adaptation policy is also critical for helping ensure marine health. Continued marine research, mapping and characterising of Ireland's seabed and water column is critical. There are also plans to expand the MPA network in Ireland, a key objective in the National Biodiversity Action Plan 2017-2021.</p>
Climate Change	<p>Irish per capita greenhouse gas (GHG) emissions remain among the highest in Europe, with emission levels remaining coupled with economic activity. The overall trend for Ireland is mixed; emissions have increased overall by 10.1% on 1990 levels, but have been lower since the 2008 recession, with emissions declining 4.5% on 2018 levels. However Ireland will still likely exceed its 2020 target under the EU's effort Sharing Decision.</p> <p>Agriculture is the largest source accounting for 35.3% of total national emissions, with transport contributing 20.3%. Sectors such as energy are showing decreases in GHGs due</p>

Theme	Key Findings
	<p>to increased use of renewables and improving standards. In 2019 emissions from energy industries decreased by 11.2% on 2018, this decrease was driven by the replacement of fossil fuels with renewable energy. The GHG emissions from energy industries accounted for 15.8% of the total emissions nationally in 2019. Emissions from agriculture also decreased by 3.9% in 2019 driven by a reduction in fertiliser use; however this welcome reduction may prove challenging to sustain with the planned increase in national dairy herd numbers.</p> <p>At an international level, reductions of 45% on 2010 emission levels are needed to limit global temperature rise to 1.5°C by 2030, aiming for net zero emissions by 2050. The National Mitigation Plan (NMP) was the first step in addressing measures across various sectors to tackle climate change mitigation. Ireland's first statutory National Adaptation Framework (NAF) published in 2018 then set out the national strategy to reduce Ireland's vulnerability to the effects of climate change. The 2019 Climate Action Plan outlines how Ireland will reduce its total GHG emissions by up to 25% by 2030 compared to 2020 levels, with full implementation of the policies and measures. Further reductions are urgently needed across all sectors. Longer term horizons pose a serious challenge for Ireland based on current trajectories, as Ireland is not on track to meeting its National Policy Position of 80% reduction in CO₂ emissions by 2050. Behavioural changes across all levels of society will also be required; an EPA survey indicated 58% of adults believe climate change is one of the top three environmental concerns requiring action. Ireland's Climate Action Plan aims to reach climate neutrality by 2050, which is an ambitious goal.</p>
Air Quality	<p>While air quality is of a good standard compared to other EU member states, monitoring shows that local levels of some pollutants, e.g. nitrogen dioxide (particularly in cities) are at concentrations that may impact on health. Trends of polycyclic aromatic hydrocarbons (PAH) levels in Ireland are a concern, with four breaches of EEA limits recorded in 2019, and two breaches of WHO limits on ground-level ozone. The latest figures from the EEA report, <i>Air Quality in Europe 2019</i>, indicates that there have been approx. 1,300 premature deaths in Ireland that could be linked to air pollution (compared to 1,200 estimated deaths in 2012). This indicates that air quality problems may be more widespread in Ireland than previously thought.</p> <p>Continued effort is being made to reduce air pollution through the phasing out of coal and peat burning for energy and space heating. Particulate matter also arises from the burning of any solid fuel, e.g. for the heating sector, including household sources such as wood fires and stoves. Incentives in recent years to change from petrol to diesel in the personal car fleet has had unforeseen and significant effects on air quality, increasing key pollutants in cities especially particulate matter (PM₁₀ and PM_{2.5}). Measures such as increasing uptake of electric vehicles and heating upgrades will help tackle these issues.</p> <p>Air quality is also a transboundary issue; air pollution events continue to impact Ireland annually from sources such as ozone and particulate matter from continental Europe. In terms of the marine environment, the main source of air pollution is from shipping, namely of sulphur oxides, nitrogen oxides and particulate matter, as well as volatile organic carbons (VOCs). Given the transboundary nature of shipping and the difficulty of attributing emissions to individual countries, emissions from shipping is regulated under the international MARPOL Convention. From January 2020, new sulphur limits apply for ship fuels, which will lead to improvements in maritime air quality and for human health, for particularly settlements in proximity to ports. Ammonia emissions from agriculture is also a domestic as well as a transboundary issue (particularly for sensitive habitats where atmospheric deposition can cause impacts), and Ireland continues to exceed its EU limits for ammonia emissions. Given the strong economic drivers for growth in the agricultural and food production sectors, urgent action is needed.</p> <p>The adoption of the National Clean Air Strategy for Ireland (2019) that integrates the WHO emission standards is needed. Ireland may need to adopt these stricter WHO guidelines, namely for particulate matter and ozone (particularly in the summer months), as compliance with the EU limit values is still not considered enough to protect health. In this regard, Dublin has become the first Irish city to sign up to the WHO <i>Breathe Life</i> campaign which requires a commitment to meet WHO guideline values by 2030, which are stricter than those currently set at EU level. Monitoring of air quality in Ireland has however been expanded under the Air quality National Ambient Air Quality Monitoring Programme. The Dublin local authorities will also implement an Air Quality Action Plan for Dublin. Continued citizen engagement on air quality issues is also key for raising awareness, such as the GLOBE Programme, as well as continued research in air quality issues.</p>

Theme	Key Findings
Environmental Noise	<p>Environmental noise arises from human activities and is considered unwanted or a nuisance. Exposure to environmental noise long-term can have adverse effects on human health as a source of annoyance and for disturbing sleep, as well as affecting overall mental wellbeing. Environmental noise can also disturb species.</p> <p>The main sources of environmental noise are from roads, railways, airports and industrial activities. Terrestrial sources of noise are regulated under the Environmental Noise Directive [END] (2002/49/EC). Noise mapping is required where the aforementioned sources reach certain thresholds for transport movements and for certain population sizes for agglomerations/major cities (in Ireland, Dublin, Cork and Limerick fall within the threshold). Noise Action Plans must also be prepared by local authorities where the thresholds are reached. The number of noise complaints has been increasing in Ireland; the majority are made to local authorities and a smaller number made to the EPA. These relate to entertainment sources, noise in neighbourhoods, transport sources and industrial/commercial sources. Of the complaints made to the EPA about EPA-licensed facilities, about a third relate to noise issues.</p> <p>Airports are increasingly significant sources of noise as airline passenger numbers increase. Dublin Airport experiences the most passenger numbers and also has the greatest proportion of noise complaints (1,453 in 2018; DAA). Cork and Shannon Airports have also seen passenger numbers increase annually but with relatively few noise complaints for Cork Airport and none for Shannon Airport over the past three years.</p> <p>The National Planning Framework's National Policy Objective 65 will be a significant driver of noise policy in Ireland, which seeks the proactive management of noise. National noise planning guidelines for local authorities is flagged as a need by the EPA.</p>
Land and Soil	<p>Soil is a finite resource and are critically important to preserve through careful spatial planning and land use management. Clean and healthy soils underpin many biological processes, are ecologically critical, act as carbon sinks, and provide clean air, food and water. Teagasc have indicated that 57% of soil samples had a pH at or above 6.3, considered optimal for agriculture which reduces the need for liming and fertilisers. The six overarching pressures that cause serious deterioration in land and soil are: soil sealing, erosion, organic matter decline, compaction, salination and landslides.</p> <p>There is no single national-scale baseline dataset of land use or land cover for Ireland. The CORINE dataset is the nearest proxy, but currently has resolution issues (the smallest unit of mapping is 25ha), however more detailed sectoral mapping is available for agriculture and forestry. The resolution is planned to be improved to 0.1 ha during 2021. According to the latest CORINE dataset (2018), artificial and built surfaces nationally account for approximately 2.46% of Ireland's land cover. The actual figure is likely to be higher given that built surfaces less than 25ha in area (including one-off housing), sections of the road/rail network, and smaller quarrying sites are not captured at this resolution. Artificial areas with sealed soil surfaces have increased by 65% since 1990. More detailed data is available on licence from the OSI via the PRIME2 spatial reference framework, as well as sectoral-specific data for agriculture (DAFM's Land Parcel Identification System) and forestry (Forest Service and Coillte data on forest assets).</p> <p>There is no European legislation which focuses on soil, leading to continuous degradation of the land and soils across Europe. A recent Global Assessment Report on Biodiversity and Ecosystem Services identified some alarming figures. Approximately 75% of the land surface has been significantly altered across the globe, as well as more than 85% of our wetland areas lost, due to anthropogenic pressures, which in turn has impacted and caused a rapid decline in ecosystems and biodiversity globally.</p> <p>The EU Seventh Environment Action Programme (EAP) committed Member States to increase efforts to reduce soil erosion, increase soil organic matter and remediate contaminated sites by 2020. The Eight EAP is in preparation and will look to 2030.</p> <p>Apart from the National Planning Framework (NPF) targets, Ireland has no specific legislation or policies to protect soils. There is however legislation in place for key habitats and ecosystems associated with peat soils and site-specific regulations linked to industrial and waste facilities.</p>
Nature	<p>The 2018 report, Sustainable Development in the European Union, warned of the worrying decline in nature globally, with species extinction rates accelerating. The UN stating that biodiversity is in crisis. In Ireland, the majority of the most ecologically important habitats are reported to be of inadequate or bad conservation status. The NPWS National Biodiversity Action Plan 2017-2021 and Ireland's Article 17 reports (NPWS, 2019) states that 85% of Ireland's EU protected habitats are at unfavourable status, with 46% showing</p>

Theme	Key Findings
	<p>ongoing declines. Agricultural practices account for 70% of the negative impacts on habitats. Most species are considered to be stable however a number of key species are declining. Aquatic species and bees are reported to be most at risk. Pressures from changes to land use, intensification of agriculture, pollution and climate change, as well as the impacts of a growing economy, are likely to bring additional pressures on a number of species and habitats in Ireland. Based on the poor conservation status of many important habitats and some species, considerable efforts and resources will be required to improve their status, both within and outside protected areas.</p> <p>It's likely that pressures due to climate change, agricultural system changes and invasive species will remain the same or increase unless immediate action is applied. A plan for developing a 10-year strategy for the agriculture and food sector may help address and improve some of the negative effects that both biodiversity and ecosystems have been impacted by agriculture.</p>
Waste	<p>Ireland generates an estimated 13 million tonnes of waste annually. A key metric is domestic material consumption (DMC) which relates to materials consumed and thus efficiency of resource use, which is tied to environmental impacts. Ireland's DMC is comparatively very high at 24.35 tonnes per person, compared to the EU average of 13.14 tonnes. This corresponds with consumption trends and household waste generation levels reported by the CSO, showing a general upwards trend since 2012. And while Ireland is currently meeting its legislative waste targets, the move to a circular economy is therefore the primary goal in terms of waste management and increasing resource efficiency.</p> <p>The three Regional Waste Management Plans were published in 2015 and will be reviewed in 2021, and will be replaced by a single plan, the National waste Management Plan. Ireland continues to move from a position of almost total reliance on landfill, to a high level of recovery, with a focus on prevention, reuse and recycling. The waste sector is almost wholly privatised which has led to considerable investment in technologies but which comes with its own challenges. While Ireland has met landfill reduction targets, municipal waste landfills as well as our waste-to-energy facilities are currently operating at capacity. More value is now being derived from waste as fuel rather than disposal, with the number of landfills reducing from 18 in 2012 to six, however much of Ireland's residual and hazardous waste and recyclable materials continues to be exported which has implications for infrastructural capacity and market security. Ireland currently has no dedicated commercial hazardous waste landfill or hazardous waste incinerator in Ireland, nor capacity to treat radioactive wastes.</p> <p>Food waste remains a significant issue; over 60% of households dispose of organic waste in the black or green bins; this is compounded with only 43% of households having a brown bin in the first place. 30% of commercial black bins consist of organic material that could have been separated. Under new legislation, separation of so-called biowaste will be mandatory from 2030.</p> <p>Litter and fly-tipping continue to remain significant problems, namely from passing pedestrians and motorists. This amounted to 70,000 tonnes in 2018. The National Litter Pollution Monitoring System reports on this issue; the proportion of areas that could be considered unpolluted was 20.5% in 2018. The EPA is also conducting a study to examine the issue of waste crimes and the costs/impacts of illegal dumping. Marine litter, both on the coast and out to sea, remains a serious issue. It can be comprised of macro items (such as discarded fishing gear and single-use plastics) down to microplastics.</p> <p>Historic landfills continue to be remediated, albeit at significant cost. There are 611 historic landfills currently registered. To date, approx. €106 million has been granted to local authorities for remediation activities on 121 landfill sites; of these 22 sites have works completed.</p> <p>Multiple agencies operate in the area of waste enforcement. The EPA's Office of Environmental Enforcement (OEE) enforces EPA waste sector licences and monitors environmental protection activities of local authorities. The OEE also coordinates the activities of the Network for Ireland's Environmental Compliance and Enforcement (NIECE). A National Waste Action Plan for a Circular Economy (published in 2020) replaces the previous national policy. Waste management is also included in the Climate Action Plan 2019, with 10 associated actions which will be key drivers for continued progress. Waste legislation is being amended in 2020/2021, to bring in challenging new targets and obligations on producers (e.g. in plastic packaging and WEEE); this change is driven by the EU's Circular Economy Action Plan 2015 (with a new EU Circular Economy Action Plan published in 2020 as part of the Green New Deal). The National Waste Prevention Programme is a key strategic way of addressing waste management issues and supporting</p>

Theme	Key Findings
	<p>the transition to a circular economy. The EPA's Green Procurement Guidance for the Public Sector are currently under review; green procurement offers a way to drive sustainable resource use and reduce waste through public sector leadership and spending. Levies, such as the Landfill Levy, also drive changes, with the amount of landfill waste disposal decreasing with the implementation of the levy fees. The EU Waste Framework Directive also provides for by-product and end-of-life classifications, which helps keep these streams within the economy as they are considered resources rather than wastes. International drivers such as the UN Sustainable Development Goals also support circular economy actions.</p>
Environment and Industry	<p>The quality of Ireland's environment has been under increasing pressure over the last decade as a result of economic changes, population growth and urbanisation, and changing consumer patterns. The main challenge for Ireland is to grow the economy in a sustainable way, with a focus being an economy that is circular, resource-efficient and striving for carbon-neutrality. Industrial activities are a key consideration and play an important role in economic development, but also need to continue incorporating sustainability principles, as well as the application of best available techniques (BAT) which impose strict licensing conditions.</p> <p>The Industrial Emissions Directive [IED] (2010/75/EU) is the principle driver for the control and mitigation of industrial impacts to the environment and human health. Across Europe, the IED covers 65 activities, and ensures industry operators obtain a license from the EPA before they can carry out any industrial action. The four largest sectors in Ireland are pharmaceuticals, food, electronic equipment and chemicals. Research is showing that regulation of industries through directives like the IED contribute to the protection of the environment and human health.</p> <p>Industrial emissions to water can cause impacts; the EPA identified that 30 industrial and 4 waste facilities were a significant pressure on water bodies. There are 27 EPA-licensed facilities on the provisional list of waste and industrial sites that are significant groundwater pressures. In terms of emissions to air from industrial facilities, the main sources are the energy and mineral sectors (cement). Carbon dioxide emissions was the most common GHG type, making up 99% of the reportable pollutant GHGs under the Pollutant Release and Transfer Register. Regulation of large combustion plants has led to significant reductions in emissions of heavy metals to the air; new licence conditions across Europe will also apply more stringent conditions. New limits will also apply to certain pig and poultry facilities from 2021 with regard to ammonia emissions.</p> <p>Industrial sources contribute to the highest proportion of hazardous waste generation in Ireland (mostly from chemicals, cement and lime industries). In recent years the chemical sector is switching to cleaner production pathways leading to a reducing in hazardous waste generated in this sector. The overall volume of hazardous waste generated from industrial facilities increased over the 2007-2017 period. BAT conclusions related to waste can sometime be qualitative rather than setting out quantitative targets; however they can lead to incorporation of circular economy principles into industrial operations.</p>
Environment and Transport	<p>The transport sector in Ireland is currently very dependent on fossil fuels, making up about 20% of GHG emissions. While emission levels dropped during the economic downturn, emissions currently remain about 15% below peak 2007 levels, also reflective of greater efficiencies, alternative fuel uptake and reductions in fuel tourism. The EEA has highlighted that use of alternative fuels, electrification of the fleet as well as major modal shifts are required to help meet decarbonisation targets. Modal shifts as well as increased fuel efficiency are critical to enable the transport sector to become faster, more convenient, and more sustainable.</p> <p>To achieve this, measures such as better, integrated spatial planning (such as through the National Planning Framework [NPF] and Regional Spatial & Economic Strategies [RSES]), capital investment as well as fiscal measures are required. Emissions from transport decreased slightly in 2019, due to an increase in the uptake of biofuels. However the sector overall represents the second-highest contributor to national GHG emissions. Emissions from the sector need to be eliminated by 2050, however Ireland's trends are not reflective of meeting this goal. Achieving energy and carbon efficiency in this sector is acknowledged but other measures, such as avoid in the first instance and shifting to more sustainable modes, are also required. Decarbonisation of the electricity-generation sector is also needed. The main policies and initiatives are included in the Climate Action Plan, the National Energy and Climate Plan, the Biofuels Obligation Scheme, the Greater Dublin Area Transport Strategy as well as the Dublin Area Cycle Network, the NPF, RSES's and the National Development Plan.</p>

Theme	Key Findings
Environment and Energy	<p>Use of fossil fuels in Ireland remains very high, providing 89% of the country's energy requirement. The shift towards renewable sources of energy will be critical in the coming decades. To achieve this, there is a requirement for large-scale investments infrastructure and technology, as well as distribution and storage systems. Further, a significant number of private and business buildings will need to be retrofitted to bring them to higher energy efficiency standards. This step this will be critical for achieving Ireland's target of a 20% reduction in energy costs from energy efficiency by 2020. More actions are needed to achieve Ireland's 2030 targets. The National Energy and Climate Plan 2021-2030 (NECP) outlines the need for an urgent transition to carbon neutrality. It outlines the policy goals to facilitate a low-carbon energy transition, and the provision of secure and competitive supplies. The main objectives of this plan for decarbonisation include: to reduce GHG emissions and by 30% by 2030; 34% share of renewable energy sources by 2030; 32.4% energy efficiency by 2030; increase energy security and the robustness of the internal energy market (development of interconnection to achieve 70% renewable electricity by 2030); and to support research, innovation and competitiveness. As energy generation is the biggest contributor internationally to GHG emissions, Ireland needs to realise its renewable energy potential. In this regard, the Climate Action Plan has a longer-term target of 70% renewable electricity by 2050.</p> <p>Achieving climate neutrality by 2050 brings enormous challenges, requiring urgent behavioural changes and rapid large-scale solutions to be deployed as well as tackling barriers to change (e.g., financial, technological). Engagement with the public and stakeholders is necessary to help mobilise these changes.</p>
Environment and Agriculture	<p>Agriculture is the largest user of land in the country, with about 67% of total land cover. Food Wise 2025 is the main agricultural strategy developed to increase productivity, export and employment. The main challenges will be to increase primary production in a way that is sustainable and does not adversely impact the environment. Currently, the agriculture sector in Ireland accounts for highest proportion of national GHG emissions, at about 35% (mainly from methane and nitrous oxide). While emissions from agriculture dropped slightly in 2019, there remain challenges to achieving 2020 and 2030 national emissions reduction targets e.g. given plans to increase national dairy herd numbers. Other transboundary emissions such as ammonia from fertiliser use, are also above Ireland's National Ceiling Directive limit. Under the Kyoto Protocol reporting, Ireland's grasslands are currently a net source of carbon emissions, when they should be acting as a sink. This issue will become more pressing in terms of understanding the source and scale of carbon sources and sinks, as the EU now requires reporting on emissions and removals from land use, land cover and forestry. Hedgerows for instance are sinks, as are undisturbed peaty soil and bogs. Protection of the environment and biodiversity areas in general becomes critical.</p> <p>Diffuse loss of nutrients from agriculture to water remains a major environmental pressure. Current actions to address these issues are covered by the Common Agricultural Policy, the Nitrates Action Programme, Origin Green, the River Basin Management Plans, Climate Action Plan, as well as the Industrial Emissions Directive. A strong research and evidence base, as well as sharing of information and knowledge, will be critical to keep all stakeholders informed, so that protection of the environment and agricultural productivity can be balanced.</p>
Environment, Health and Wellbeing	<p>Environmental sources of harm include the built environment, the natural environment and consumption patterns. It is therefore recognised that health and wellbeing are tied to a good quality environment. The overall quality of the Irish environment is generally good, but health impacts associated with air pollution in Ireland, particularly from traffic in cities and burning of smoky solid fuels, are still issues that require further measures. Exposure to noise, odours and radon in homes also impact health. The availability, safety and attractiveness of high-quality green spaces (parks, woods, countryside) and blue spaces (ponds, river banks, lakeshores and seashores) helps to foster activity on the road to better health.</p> <p>The EU's Drinking Water Regulations set quality standards for water at the tap, however there are still some problems which need to be tackled such as long-term boil notices and addressing key priorities such as lead, disinfection, pesticides etc. The quality of Ireland's bathing waters has remained high, with the vast majority meeting required EU standards. Work still remains on addressing urban wastewater discharge quality in some areas, and eliminating discharges of raw sewage. Sewage sludge, which may be repurposed for land-spreading, needs to consider issues such as chemicals and levels of heavy metals.</p> <p>Damage to health associated with environmental pollution in Ireland is much less than that caused by lifestyle factors such as poor diet, lack of exercise and tobacco use. Emerging</p>

Theme	Key Findings
	risks include impacts from climate change, microbial resistance, chemical substances of concern, as well as seafood safety and emerging issues such as micro- and nano-plastics in drinking water and marine food webs (including seafood). The ongoing protection of Ireland's high-quality environment is vital. The 'One Health' approach is increasingly becoming more mainstream, as society recognises that good health and wellbeing relies on a good quality and healthy natural environment and ecosystems.
Environmental Performance, Policy & Implementation	<p>Ireland has made improvements some areas of environmental concern. However, the sheer scale and speed at which these improvements are being made are insufficient in terms of meeting EU and national objectives in the long-term e.g. water and air quality protection of nature as well as an ambitious goal to be climate neutral by 2050. International goals such as the UN Sustainable development Goals are another avenue for driving sustainable changes, but their implementation and integration at different planning levels is variable. In recognition of an increasingly interconnected world, the EEA has also outlined a series of global mega-trends which should be considered in terms of their impacts on Europe's environment and the implications for sustainable development and resource use e.g. population/ economic growth, competition for resources, environmental pollution, and climate change.</p> <p>Environmental policy implementation to date in Ireland has been difficult for many reasons including population growth, production/consumption demands and climate change. This is leading to a net decline in the overall state of Ireland's environment. To reverse this, strict enforcement of legislation and policies is required from local to national levels. The EC's Environmental Implementation Review 2019 for Ireland sets out priority actions that can address these challenges.</p>

5.5.1 County Clare

Some of the most significant environmental issues that are currently affecting County Clare, which are relevant to the RES, are outlined in **Table 5.5.3**.

Table 5.5.3: Existing Environmental Issues in County Clare relevant to the RES

Topic	Existing Pressures
Population/ Human Health	<p>Whilst a growth in population is evident in County Clare unemployment and retaining a young working population in western counties remains the main issue. There are 5 Seveso sites in the Draft RES area. Renewable energy (RE) development will result in employment opportunities and retaining future work force within the County.</p> <p>The interaction between the natural environment, and the state and health of that environment, tied to human health and wellbeing, as well as sustainable living. Renewable energy is recognised as a component in creating a sustainable, low-carbon and circular economy.</p>
Traffic	In recent years population growth and increasing development has placed additional pressure on the existing road network.
Cultural Heritage	Inappropriate developments may impact on the known and sub-surface archaeological heritage features. In particular, there is existing pressure from dredging of the Shannon Estuary which has the potential to disturb historical shipwrecks, as only several are in known locations. Inappropriate developments adjacent to protected structures is an existing pressure.
Air and Climate	<p>Air quality is generally good in the County, with Clare's geographical location in an area with a relatively mild climate which has an almost continuous movement of clean air. The biggest threat now facing air quality is emissions.</p> <p>Renewable electricity development under the Draft RES would lead to predominantly positive implications for air quality, where such development takes the form of wind and solar for instance, as the most common RES deployments in Ireland. While there would be impacts to air quality during the construction and decommissioning phases of any RE infrastructure, the long-term impact is positive as there are no combustion-related emissions associated with the operational phase.</p>

Topic	Existing Pressures
	<p>Ireland has a long way to go to reach national and European targets, and is not on track for meeting 2030 or 2050 targets for emissions reductions. The EPA states that the energy sector needs to shift away from the over-reliance on fossil fuels in order to effectively tackle climate change. As the RES will form a strategy for the future development of RE (namely wind and solar), it will directly contribute to Ireland's and Clare's approach for addressing climate change, as rapid deployment of renewable energy sources is required to replace fossil-fuel dependence.</p> <p>The RES will also address other sources of Green House Gas Emissions (GHG) in particular from road traffic which is the biggest contributor to greenhouse gas emissions in County Clare and Ireland in general.</p>
Inland and Marine Waters	<p>The Water Framework Directive (WFD) for surface and groundwaters, and the Marine Strategy Framework Directive (MSFD) for marine waters, are the primary legislation for achieving water quality in Ireland. While Ireland's surface and groundwater water quality compares favourably with other EU Member States, there are ongoing pressures and problems associated with achieving and maintaining at least good status in line with the WFD, while the MSFD's Programme of Measures were established in 2016 with implementation and monitoring ongoing.</p> <p>Currently the 3rd cycle National River Basin Management Plan for 2022–2027 is being prepared. Of the 46 Catchment management units in Ireland Clare County is part of 4 of them- Lower Shannon, Shannon Estuary North, Mal Bay and Galway Bay South East.</p> <p>A range of activities occurring in these catchments have been identified which are putting pressure on water quality. The main pressures include agricultural runoff, one-off housing with associated individual on-site treatment systems, wastewater and industrial discharges, hydromorphology and forested areas which are poorly managed, lake impoundments and alterations in drainage at important transitional waterbody areas such as ports.</p> <p>The water environment also hosts many European and nationally designated sites. The key aspects of the water environment in relation to the RES are that increased RE development could lead to impacts to the water environment (including the marine environment in the case of offshore wind), such as sediment released during construction, with knock-on effects for aquatic flora and fauna. There is also the potential for development to facilitate the spread of aquatic invasive species.</p> <p>Another key issue facing County Clare over the past number of summers has been water quality of our bathing waters. In 2020 many beaches throughout the county saw rolling closures following periods of heavy rainfall.</p>
Waste Management	<p>Ireland continues to move from a position of almost total reliance on landfill, to a high level of recovery, with a focus on prevention, reuse and recycling. More value is now being derived from waste as fuel than from disposal, with the number of landfills reducing from 18 in 2012 to 3 operational municipal landfills as of 2021, however much of Ireland's residual waste continues to be exported which has implications for infrastructural capacity and market security. Of note is that Ireland only has one landfill which can receive contaminated waste (lightly contaminated). Future large-scale RE development proposals have the potential to lead to the generation of wastes, such as historically contaminated soils, which need to be handled and disposed of/ exported, and this has implications for large-scale renewables deployment.</p>
Flood Prevention	<p>There are areas in County Clare subject to flooding. In-house flood risk assessment carried out by Clare County Council, in addition to a Strategic Flood Risk Assessment carried out for the SEA of the CDP, found that the county is vulnerable to flooding from a number of hazard sources including: fluvial (river flooding), pluvial (flooding due to rainfall or other precipitation), coastal (e.g. tidal surges), groundwater (notably in karst regions, such as the Burren); flooding from canals and reservoirs; and flooding in urban areas due to inadequate drainage and over-capacity sewers.</p> <p>Floodplains should be preserved as they are valuable resource for mitigating flood risk and inappropriate development should be avoided.</p>
Biodiversity	<p>The county contains a significant number of designated sites, including SACs, SPAs, NHAs, pNHAs and Ramsar sites which demonstrates the important ecological status of the county - Clare is home to the River Shannon and River Fergus Estuaries SPA, Cliffs of Moher SPA, Lower River Shannon SAC and East Burren Complex SAC - some of the most important European sites in Ireland.</p>

Topic	Existing Pressures
	<p>The main impacts to biodiversity in Clare are habitat loss and fragmentation, climate change and invasive species. Agricultural practices which are intensified or abandoned also put increasing pressure on biodiversity, as does surface run off, housing developments, sites which are contaminated and monoculture developments.</p> <p>The key issues associated with the development of the RES on biodiversity relate to impacts to mobile species (particularly birds and bats from wind energy), disturbance effects and scare responses, loss/ fragmentation of habitats and disturbance to species/ spread of invasives from land use change, emissions to water courses, as well as cumulative effects resulting from numerous developments. Developments in lacustrine, fluvial and estuarine systems such as from the development of hydro and wind energy projects have the potential to impact on designated sites and biodiversity through disturbance to habitats, dredging and construction activities.</p> <p>The potential impacts to biodiversity from RE development are acknowledged, however the impacts to biodiversity from climate change are also significant, including changing migration patterns, loss of food sources, proliferation of invasive or alien plants and animals, etc. The development of RE projects will have positive impacts in the long term as they will contribute to reduced GHG emissions. While the Draft RES sets the framework for development, it itself does not confer planning consent and any RE proposal will require detailed environmental assessments at project level.</p>
Soils/ Geology	<p>Soil is a valuable, non-renewable resource that supports and underpins many ecosystem services such as biodiversity, food production and natural drainage. Key pressures include erosion, compaction, sealing, contamination from various activities and development in areas where the depth of soil is insufficient. In terms of land and land use, in addition to renewable energy development, sectoral competition and demand for land e.g. forestry, agriculture, can put pressure on land and soil in terms of available space and resources, and land use changes. It is noted that there is a lack of legislative protection for soils in general at both European and national level. There are potential negative impacts for land and soils where RE development occurs on greenfield areas. Erosion of soils and increased sediment movement or emission to watercourses can also occur during the construction phase of RE development. RE development may also be targeted to peatland areas and bogs; bogs are a non-renewable resource, and are host to protected habitats and species. They can also form significant carbon sinks where the bog is healthy and active.</p> <p>Geothermal energy developments need to be located away from karst areas or where there is an existing high groundwater vulnerability rating and a shallow soil profile (which are unable to accommodate subsurface structures). RE developments should also be located away from significant peat or bog areas.</p>
Landscape	<p>Pressures from developments which may affect the visual and amenity character of landscape, such as may occur under the draft RES, include the visual impact of turbines (including any potential for cumulative effects) or the construction of other such developments. Hydro or offshore wind developments may impact the visual/scenic quality of seascapes, depending on location and this needs to be balanced against site suitability.</p>
Material Assets	<p>Lack of a security of supply for thermal treatment facilities is recognised as a threat, as is the lack of adequate facilities for biological waste treatment.</p> <p>There is high technical potential for hydro power in Clare given the county's large coastline and water resources. Clare has a history of utilising hydro power (e.g. Ardnacrusha hydroelectric power station) – however realistic plans will be influenced by specific site conditions. Developments could also be influenced by fishery interests and seasonal water flow, and balanced with the needs of tourism. Other constraints include establishing adequate grid connections and lack of interconnections with neighbouring countries (connected countries can buy and sell power during seasonal fluctuations without the need to store energy); the need to be in close proximity to existing wind energy developments, high capital costs and policy gaps at the National and Regional level (currently no guidance for energy storage or site selection) are other considerations.</p> <p>While Pumped Hydroelectric Energy Storage (PHES) is the most mature and largest energy storage technique available, these developments are also constrained by high capital costs, long lead-in times and policy gaps at the National and Regional levels.</p> <p>For anaerobic digestion (AD) developments, there is a lack of facilities to treat biological waste to generate energy. The 3 regional waste management plans 2015-2021 will be</p>

Topic	Existing Pressures
	<p>consolidated into one National Waste Management Plan for the next 6 year cycle with the development of A Waste Action Plan for a Circular Economy – Ireland’s National Waste Policy 2020-2025 which will aim to preserve resources, reduce consumption, and reduce waste at all levels of society.</p> <p>For offshore wind developments, the National Marine Planning Framework (NMPF), is identified as part of a suite of marine planning reform measures to modernise elements of the marine development management , along with the need to balance the installation of such developments with fishing, aquaculture, tourist and navigational needs and interests.</p> <p>All renewable energy developments have the potential to effect or impart environmental pressures in particular on biodiversity, habitats/designated areas and water quality, in addition to the visual impact to scenic landscapes and settlements.</p>

5.6 Biodiversity, Flora and Fauna (BFF)

5.6.1 Introduction

‘Biological diversity’ or biodiversity, means “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (The United Nations Convention on Biodiversity, 1992).

In general terms biodiversity refers to:

- Different **habitats** such as woodlands, wetlands, grasslands and estuarine habitats and the range of flora and fauna species they support.
- Different **species** such as plants, mammals, birds, insects, fish, microbes, mosses and fungi, and their inter-relationships such as food chains and cohabitation.
- **Genetic diversity** within species which is vital for healthy populations of individual species to survive.
- **Ecosystems diversity** which are the relationships between different species, their habitats and their local, non-living environment (geology, hydrology and microclimate).
- Features of the **landscape**, which by virtue of their linear and continuous structure (such as hedgerows or streams) or their function as links (such as ponds or small woods) are essential for the migration, dispersal and genetic exchange of wild species.
- Flora and Fauna are the plant and animal life, respectively.

A wide range of economic and social benefits and services result from the protection of biodiversity, for example, it forms the basis of our landscapes, provides for food and clean water supplies, opportunities for waste disposal, nutrient recycling, flood storage and regulation, amenity and recreational opportunities through development of green infrastructure networks.

Key Legislation

EU Habitats Directive (92/43/EEC)

The Habitats Directive provides the legislative framework for the protection of habitats and species throughout Europe through the establishment of a network of designated conservation areas known as the Natura 2000 network. The Natura 2000 network includes sites designated as Special Areas of Conservation (SACs), under the EU Habitats Directive and Special Protection Areas (SPAs) designated under the EU Birds Directive (now called Codified Directive 2009/147/EC).

There are 24 Articles contained within the Habitats Directive. Article 6 is viewed to be one of the most important of the 24 as it determines the link between land use and conservation. It contains three main sets of provisions. In summary, Article 6(1) sets out measurements that are necessary for conservation with a focus on both positive and practical interventions. Article 6(2) places emphasis on prevention, setting out that habitat deterioration and species disturbance should be avoided. Articles

6(3) and 6(4) set out a series of procedural safeguards presiding over plans and projects that are likely to have a significant effect on an identified European site(s).

Article 10⁷ of the Directive covers stepping stones and ecological corridors including nature conservation sites, other than European site(s), habitat areas and species locations including areas of ecological importance identified through habitat surveys.

EU Birds Directive (now called Codified Directive 2009/147/EC)

The Birds Directive was anticipated by the Wildlife Act (1976) and its provisions covered many of the requirements of the Birds Directive. Article 7 of the Habitats Directive makes the provisions of Article 6(3) and 6(4) applicable to Special Protection Areas.

The Birds Directive requires that important concentrations of migratory waterfowl and internationally important wetlands be protected in the same way as Annex 1 and Annex II habitats and species under the Habitats Directive. In addition, case law under the Birds Directive indicates that internationally important bird sites are given protection equivalent to priority listed habitats and species under the Habitats Directive.

Environmental Liability Directive (2004/35/EC)

The Directive establishes a framework for environmental liability based on the "polluter pays" principle, with a view to preventing and remedying environmental damage. The Directive defines "environmental damage" as damage to protected species and natural habitats, damage to water and damage to soil. Operators carrying out dangerous activities listed in Annex III of the Directive fall under strict liability (no need to prove fault). Operators carrying out other occupational activities than those listed in Annex III are liable for fault-based damage to protected species or natural habitats. The establishment of a causal link between the activity and the damage is always required. Affected natural or legal persons and environmental NGOs have the right to request the competent authority to take remedial action if they deem it necessary.

European Communities (Environmental Liability) Regulations 2008

The European Communities (Environmental Liability) Regulations 2008, came into force in Ireland on 1st April 2009. These Regulations (SI 547 of 2008) transpose EU Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage. The purpose of these Regulations is to establish a framework of environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage. The EPA is designated as the competent authority for all aspects of these Regulations.

Wildlife Act 1976 and Wildlife (Amendment) Act 2000

The Wildlife (amendment) Act, 2000 protects species at the national level which is implemented through a series of regulations. Its main objectives inter alia are to:

- Provide a mechanism to give statutory protection to Natural Heritage Areas (NHAs)
- Provide for statutory protection for important geological and geomorphological sites, including fossil sites by designation as NHAs
- Improve some existing measures and introduce new ones, to enhance the conservation of wildlife species and their habitats
- Broaden the scope of the Wildlife Acts to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act
- Increase substantially the level of fines for contravention of the Wildlife Acts and to allow for the imposition of prison sentences
- Strengthen the provisions relating to the cutting of hedgerows during the critical bird-nesting period and include a requirement that hedgerows may only be cut during that period by public bodies, including local authorities, for reasons of public health or safety

⁷ Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora.

- Strengthen the protective regime for Special Areas of Conservation (SACs) by removing any doubt that protection will in all cases apply from the time of notification of proposed sites.

National Biodiversity Action Plan 2017-2021

The National Biodiversity Action Plan sets out a vision and strategic objectives for the conservation of Ireland's biodiversity. The vision for Ireland's biodiversity is 'that biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally'.

The targets set in this plan are in the context of the seven strategic objectives retained from the second National Biodiversity Plan, which ran from 2011 – 2016. These objectives have laid out a clear framework for our national approach to biodiversity and continuing to focus on these pillars will ensure that we build on the efforts and achievements of the past five years while looking ahead to what we can achieve over the next five years.

The seven strategic objectives are set out below.

1. Mainstream biodiversity into decision-making across all sectors.
2. Strengthen the knowledge base for conservation, management and sustainable use of biodiversity.
3. Increase awareness and appreciation of biodiversity and ecosystems services.
4. Conserve and restore biodiversity and ecosystem services in the wider countryside.
5. Conserve and restore biodiversity and ecosystem services in the marine environment.
6. Expand and improve management of protected areas and species.
7. Strengthen international governance for biodiversity and ecosystem services.

Clare Biodiversity Action Plan 2017-2023

The 3rd Clare County Biodiversity Action Plan 2017–2023, supersedes the 2nd Clare Biodiversity Action Plan, published in 2014.

The main aim of the Clare Biodiversity Action Plan 2017-2023 is to '*conserve the biodiversity of County Clare*'. Over the course of the last Biodiversity Plan there were annual Biodiversity awareness initiatives, community events and activities: Biodiversity Week and Heritage Week, talks, outings, bog walks, bat outings, practical demonstrations, wildlife surveys, public workshops, articles written for local media, alongside working with local communities to undertake Local Biodiversity Actions and planning.

Similar to the objectives of the National Biodiversity Plan, the Clare Biodiversity Action Plan is consistent with the 'ecosystem approach'. The ecosystem approach ensures that all of the essential processes, functions and interactions between species, their habitats and their local, non-living environment have been taken into account when promoting best practice management and guidelines for biodiversity conservation.

Clare County Heritage Plan 2017-2023

The County Clare Heritage Plan identifies heritage as landscape, seascapes, flora, fauna, wildlife habitats, monuments, archaeological objects, architectural heritage, heritage objects, geology, inland waterways, heritage gardens and parks, wrecks, and elements of cultural heritage such as genealogy, place names, the Irish language, traditional music and oral history recording.

The aims of the Clare County Heritage Plan 2017-2023:

- Identify, manage and conserve heritage for the benefit of all;
- Collect and make available heritage information;
- Raise awareness through education initiatives;
- Acquire knowledge through surveys and research; and
- Inform public policy on heritage.
- Support the strategic and integrated management of heritage at a local level.

The Clare County Heritage Plan 2017-2023 is focused on six key themes and under each theme there are a number of identified actions which can be implemented over the life time of the Plan.

The six themes are:

1. Community.
2. Training and Education.
3. Sustainable Tourism.
4. Biodiversity, Climate Change and Green Infrastructure Planning.
5. Built Heritage.
6. Cultural Heritage.

Theme number four, Biodiversity, Climate Change and Green Infrastructure Planning, aims to;

- Develop and work to implement the County Clare Biodiversity Action Plan 2017-2023 in partnership with all relevant stakeholders and the community;
- Promote and implement the All-Ireland Pollinator Plan 2015-2020 and local associated initiatives;
- Further raise awareness of the value, role and function of wetlands in the County;
- Support the Local Authority Waters and Community Officer in their work with communities to understand the value of the aquatic environment and to take the leadership role in the protection of our wetlands, including measures to protect high status sites in County Clare, provision of community wetlands, integrated constructed wetlands, natural flood areas with a particular focus on the River Fergus catchment involving community action;
- Assist in the pilot scheme to map, establish demonstration plots and provide training on Invasive Species as part of an overall Clare County Council corporate strategy to control and eradication of Invasive Species;
- Input into the Clare County Councils Adaptation Team as required under the National Climate Change Adaptation Framework (NCCAF) in preparing the local authority adaptation strategy;
- Further implement the existing Green Infrastructure Plans and consider other opportunities for green infrastructure planning; and
- Enhance biodiversity by providing training and guidance on Green Infrastructure and through the promotion and adoption of a green infrastructure-based approach to planning.

5.6.2 Biodiversity and Climate Change Adaptation

Flood plains and wetland areas are essential for flood control, pollution control, water quality and supply as well as act as vital carbon sinks, along with peatlands and woodlands, which could help address climate change. Changes in precipitation levels, air and soil temperatures, water availability and sea level rise all have implications in terms of effects on biodiversity. The effects will be cumulative, long-term and often complex. The uncertainty that surrounds climate change and what will occur also adds to the complexity and uncertainty of identifying impacts.

Climate change is regarded as the biggest environmental issue facing the world today. The release of greenhouse gases, such as carbon dioxide, is regarded as one of the main drivers of climate change. Biodiversity, and particularly plants, play a significant role in removing this carbon dioxide from the atmosphere and storing it through photosynthesis. However, activities which lead to a loss of vegetation prevent this critical service from occurring, while activities such as the drainage of peatlands can actually release more carbon dioxide into the atmosphere. Combined, these activities can speed up the rate of climate change. The rate of biodiversity loss across the world has been inextricably linked to the rate of global climate change. However, there has been an increasing move towards trying to adapt to climate change, rather than trying to stop it, and in this regard, biodiversity has another significant role to play, particularly in relation to flood attenuation.

Wetlands, such as bogs, fens, swamps and marshes, slow down the flow of water, and so help to regulate flooding, however, their loss not only exacerbates the level of flooding, but also its speed, which leads to flash flooding. Wetlands can contain huge volumes of water (bogs, for example, are

made of over ninety percent water) and when a wetland is drained, the water must go somewhere, and water will always flow to the lowest lying areas. The protection and retention of river floodplains from infilling, reclamation or development is also vitally important to ameliorate the impacts of flooding.

5.6.3 Biodiversity in the Plan Area

The Plan area is rich in biodiversity, containing many important, and protected, habitats and species such as the Shannon Estuary, lakes, turloughs, fens, wetlands, woodlands, bats, wildfowl (duck and geese), waders, salmon, lamprey and otters. However, it also contains many other habitats which are not protected such as scrub, parks, streams, hedgerows, tree lines, roadside verges, housing estate open spaces and gardens. It is these locally important habitats and species within the landscape, including extensive areas of wetland, fens, broadleaf woodlands, grasslands and turloughs, which provide links between the more rare and protected habitats, and are essential for the migration, dispersal and genetic exchange of wild plants and animals such as garden birds (robins, wrens, finches, etc.) and migrant summer visitors (swallows, cuckoos, warblers, etc), otters, hedgehogs, bats, pigmy shrew and other Irish mammals, lamprey, salmon and other fish species, and a variety of invertebrates, including beetles, bees, butterflies, dragonflies and damselflies. They also allow for the spread of seeds, which benefit the wildflower populations of County Clare. It is recognised that many rare and protected species are reliant on locally important species, and as such the protection of common habitats and species should not be underestimated.

While not explicitly stated, there is a hierarchy within biodiversity, by virtue of the legislation which protects it. At the top are sites designated (or proposed for designation) for nature conservation under European legislation (SACs, SPAs), followed by those designated (or proposed for designation) by national legislation (NHAs, pNHAs). Next, there are habitats and species outside designated sites which are protected under European legislation, followed by those protected under national legislation. There are locally important areas protected by virtue of their zoning in land use plans, and finally, there is biodiversity, which is not directly protected by legislation, for example in proposed Natural Heritage Areas (pNHA).

Within County Clare there are habitats of high biodiversity and conservation value, including the wildfowl sanctuaries of Mutton Island, Islandavanna, Tullagher Lough, Inagh River (part of) and Ballyallia Lake and the Ballyteigue, Caher (Murphy) Dromore and Keelhilla nature reserve. There are a number of designated sites associated within the county which are designated as Ramsar Sites, Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Natural Heritage Areas (NHAs).

Natural Heritage Areas also have a significant role in supporting the species using European sites mainly relating to mobile fauna such as mammals and birds which may use pNHAs and NHAs as “stepping stones” between Natura 2000 sites. Article 10 of the Habitats Directive and the Habitats Regulations 2011, place a high degree of importance on such non-Natura 2000 areas as features that connect the Natura 2000 network. Features such as ponds, woodlands and important hedgerows form key “stepping stones”.

5.6.4 European Sites

Special Areas of Conservation (SACs) have been selected for protection under the European Council Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) - referred to as the Habitats Directive. The Habitats Directive seeks to establish the Natura 2000 network, a network of protected areas (European Sites) throughout the European Union. It is the responsibility of each Member State to designate SACs to protect habitats and species, which, together with Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC), form the Natura 2000 network. The integrity of a European Site (referred to in Article 6.3 of the EU Habitats Directive) is determined based on the conservation status of the qualifying features of the SAC. The qualifying features for the designated sites have been obtained through a review of the Conservation Objectives available from the National Parks and Wildlife Service (NPWS). The SACs and SPAs associated with the Development Plan area are listed in **Table 5.6.1** and **Table 5.6.2** respectively and illustrated in **Figure 5.6-1** and **Figure 5.6-2**.

Table 5.6.1: List of Special Areas of Conservation (SACs) in the Clare County Development Plan Area

Designated SAC	Site Code	Qualifying Interests
Ballyallia Lake SAC	000014	It is a naturally eutrophic lake which is a habitat listed under Annex I of the habitats directive. It also contains significant numbers of the Whooper Swan which is an Annex I species under the Birds Directive.
Ballycullinan Lake SAC	000016	Designated for the presence of <i>Cladium fen</i> , a habitat listed under Annex I of the EU Habitats Directive.
Ballyogan Lough SAC	000019	This site contains the Annex I species <i>Cladium fen</i> .
Black Head – Poulsallagh Complex SAC & pNHA	000020	Designated for the presence of Annex I species such as Reefs, Perennial vegetation of stony banks, Alpine Heaths, <i>Juniperus communis</i> formations on heaths or calcareous grasslands, lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>), Petrifying springs with tufa formation, limestone pavements and submerged or partly submerged sea caves. In addition the site contains the Annex II species such as <i>Petalophyllum ralfsii</i> .
Danes Hole, Poulnalecka SAC	000030	This site is significant as it is a winter hibernation site and a mating site of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>), which is a species listed under Annex II of the EU Habitats Directive.
Dromore Woods and Loughs SAC	000032	This is designated for the presence of several naturally eutrophic lakes with <i>Magnopotamion</i> and <i>Hydrocharition</i> -type vegetation and limestone pavements which are listed under Annex I of the EU Habitats Directive as well as the Otter which is listed under Annex II of the EU Habitats Directive.
Inagh River Estuary SAC & pNHA	000036	Species listed under Annex I of the EU Habitats Directive such as <i>Salicornia</i> and other annuals colonizing mud and sand, Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimi</i>), Mediterranean salt meadows (<i>Juncetalia maritimi</i>), shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) and fixed coastal dunes with herbaceous vegetation (grey dunes).
Pouladatig Cave SAC	000037	Designated for the presence of the Lesser Horseshoe Bat (<i>Rhinolophus</i>)
Lough Gash Turlough SAC	000051	This site is significant as it is a Turlough habitat under Annex I of the EU Habitats Directive.
Moneen Mountain SAC	000054	Designated for the presence of limestone pavement and its associated calcareous grassland and juniper scrub and heaths which are listed under Annex I of the EU Habitats Directive. The Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) can be found at this site and is listed under Annex II of the EU Habitats Directive.
Moyree River System SAC	000057	Limestone pavement, floating river vegetation, alkaline fen and caves are the Annex I Habitats located at this site. It is an internationally important summer roosting and hibernation site for the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the EU Habitats Directive.
Poulnagordon Cave (Quin) SAC	000064	Designated for the presence of a natural cave which is listed under Annex I of the EU Habitats Directive. The Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>), a species listed under Annex II of the Habitats Directive, uses the cave as a hibernation site.
Galway Bay Complex SAC & pNHA	000268	This site has the following significant habitats which are listed under Annex I of the EU Habitats Directive: Mudflats and sandflats not covered by seawater at low tide, coastal lagoons, large shallow inlets and bays, reefs, perennial vegetation of stony banks, <i>Salicornia</i> and other annuals colonizing mud and sand, Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>), Mediterranean Salt Meadows (<i>Juncetalia maritimi</i>), Turloughs, <i>Juniperus communis</i> formations on calcareous heaths or grasslands, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco Brometalia</i>) (important orchid sites), Calcareous fens with (<i>Cladium mariscus</i>) and species of the <i>Caricion</i>

Designated SAC	Site Code	Qualifying Interests
		<i>davallianae</i> and Alkaline fens. The Otter (<i>Lutra lutra</i>) and the Common seal (<i>Phoca vitulina</i>) are the species found at this site which are listed under Annex II of the EU Habitats Directive.
Loughatorick South Bog SAC	000308	Designated for the presence of the Blanket bog (active only) habitat, listed under Annex I of the EU Habitats Directive.
Ballyteige (Clare) SAC	000994	This site consists of Molina meadows on calcareous, peaty or clayey-silt laden soils (<i>Molinia caerulea</i>), a habitat listed under Annex I of the EU Habitats Directive.
Ballyvaughan Turlough SAC	000996	Designated for the presence of Turloughs which are listed under Annex I of the EU Habitats Directive.
Glenomra Wood SAC	001013	This site consists of Old sessile oak woods with Ilex and Blechnum in British Isles, listed under Annex I of the EU Habitats Directive.
Carrowmore Point to Spanish Point and Islands SAC & pNHA	001021	Designated for the presence of the following habitats listed under Annex I of the EU Habitats Directive: Coastal lagoons, Reefs, Perennial vegetation of stony banks and Petrifying springs with tufa formation (<i>Cratoneurion</i>).
Termon Lough SAC	001321	Termon Lough SAC is situated approximately 6 km south-west of Gort, on the border between Counties Clare and Galway. It consists of a series of three turloughs, with low, drift-covered slopes on all sides except in the north-east, where a small area of limestone pavement is found. Designated for the presence of Turloughs, a habitat listed under Annex I of the EU Habitats Directive.
Glendree Bog SAC	001912	Designated for the presence of Blanket Bog (active only), a habitat listed under Annex I of the EU Habitats Directive.
East Burren Complex SAC	001926	This site has the following habitats which are listed under Annex I of the EU Habitats Directive: Hard oligo-mesotrophic waters with benthic vegetation of Chara spp., Turloughs, Alpine and Boreal Heaths, <i>Juniperus communis</i> formations on heaths or calcareous grasslands, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco Brometalia</i>) (important orchid sites), lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>), Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> , Petrifying springs with tufa formation (<i>Cratoneurion</i>), Alkaline fens, Limestone pavements, Caves not open to the public, Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>). The Otter (<i>Lutra lutra</i>) is found at this site and is listed under Annex II of the EU Habitats Directive.
Old Domestic Building (Keevagh) SAC	002010	Designated for the presence of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the EU Habitats Directive.
Newhall and Edenvale Complex SAC	002091	This site is significant as it consists of the habitat Caves not open to the public which is a habitat listed under Annex I of the EU Habitats Directive. The Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>), an Annex II species can also be found at this location.
Pollagoona Bog SAC	002126	Designated for the presence of Blanket bog (active only) which is a habitat listed under Annex I of the EU Habitats Directive.
Newgrove House SAC	002157	This site is significant as the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the EU Habitats Directive can be found here.
Lower River Shannon SAC	002165	Designated for the presence of the following habitats under Annex I of the EU Habitats Directive: Sandbanks which are slightly covered by sea water all the time, Estuaries, Mudflats and sandflats not covered by seawater at low tide, Coastal lagoons, Large shallow inlets and bays, Reefs, Perennial vegetation of stony banks, Vegetated sea cliffs of the Atlantic and Baltic coasts, <i>Salicornia</i> and other annuals colonizing mud and sand, <i>Spartina</i> swards (<i>Spartinion maritimae</i>), Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>), Mediterranean salt meadows (<i>Juncetalia maritimi</i>), Molina meadows on calcareous, peaty

Designated SAC	Site Code	Qualifying Interests
		or clayey-silt laden soils (<i>Molinion caeruleae</i>) and Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>). Annex II species which are present at this site include the Freshwater pearl mussel (<i>Margaritifera margaritifera</i>), Sea lamprey (<i>Petromyzon marinus</i>), Brook lamprey (<i>Lampetra planeri</i>), River lamprey (<i>Lampetra fluviatilis</i>), Salmon (<i>Salmo salar</i>), Bottle-nosed dolphin (<i>Tursiops truncatus</i>) and the Otter (<i>Lutra lutra</i>).
Old Farm Buildings, Ballymacrogan SAC	002245	This site is significant as the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the EU Habitats Directive can be found here.
Ballycullinan, Old Domestic Building SAC	002246	Designated for the presence of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the EU Habitats Directive.
Toonagh Estate SAC	002247	This site is significant as the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the EU Habitats Directive can be found here.
Carrowmore Dunes SAC	002250	Designated for the presence of the following habitats listed under Annex I of the EU Habitats Directive: Reefs, Embryonic shifting dunes, Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) and Fixed coastal dunes with herbaceous vegetation (grey dunes). The Annex II species narrow-mouthed whorl snail (<i>Vertigo angustior</i>) can also be located at this site.
Kilkee Reefs SAC	002264	This site is significant as it consists of a Reef habitat and a shallow bay habitat which is both listed under Annex I of the EU Habitats Directive.
Slieve Bernagh Bog SAC	002312	Designated for the presence of blanket bog, wet heath and dry heath which are habitats that are listed under Annex I of the EU Habitats Directive.
Old Domestic Buildings, Rylane SAC	002314	This site contains two important breeding roosts of the lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the Habitats Directive.
Ratty River Cave SAC	002316	Designated for the presence of a cave which is listed under Annex I of the EU Habitats Directive and it is a significant winter roost and a breeding site of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the EU Habitats Directive.
Cregg House Stables, Crusheen SAC	002317	This site contains an important breeding roost of the lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the Habitats Directive. Situated approx. 1km from the Clare Border.
Knockanira House SAC	002318	This site is significant as it contains an important maternity roost of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the EU Habitats Directive.
Kilkishen House SAC	002319	Designated for the presence of an important winter roost of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) which is listed under Annex II of the Habitats Directive.
Tullaher Lough and Bog SAC	002343	Significant site as it consist of an active raised bog, degraded raised bog and Rhynchosporion and transition mire which are listed on Annex I of the EU Habitats Directive.
Ardrahan Grassland SAC	002244	Designated for Alpine and Boreal heaths, <i>Juniperus communis</i> formations on heaths or calcareous grasslands Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) and Limestone pavements which are listed on Annex I of the EU Habitats Directive.
Askeaton Fen Complex SAC	002279	Designated for Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> and Alkaline fens which are listed on Annex I of the EU Habitats Directive.

Designated SAC	Site Code	Qualifying Interests
Ballinduff Turlough SAC	002295	Designated for the presence of a turlough. The turlough is late-draining and a pool persists into June or July and re-floods easily. Turloughs are listed on Annex I of the EU Habitats Directive.
Barrigone SAC	000432	Designated for <i>Juniperus communis</i> formations on heaths or calcareous grasslands, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) , Limestone pavements and <i>Euphydryas aurinia</i> (Marsh Fritillary) [1065]. These habitats are listed on Annex I of the EU Habitats Directive.
Barroughter Bog SAC	000231	Designated for Active raised bogs, degraded raised bogs still capable of natural regeneration and depressions on peat substrates of the Rhynchosporion. These habitats are listed on Annex I of the EU Habitats Directive.
Caherglassaun Turlough SAC	000238	Designated for the presence of a turlough. Turloughs are listed on Annex I of the EU Habitats Directive.
Cahermore Turlough SAC	002294	Designated for the presence of a turlough. Turloughs are listed on Annex I of the EU Habitats Directive.
Carrowbaun, Newhall and Ballylee Turloughs SAC	002293	Designated for the presence of a turlough. Turloughs are listed on Annex I of the EU Habitats Directive.
Castletaylor Complex SAC	000242	Designated for Turloughs, Alpine and Boreal heaths, <i>Juniperus communis</i> formations on heaths or calcareous grasslands, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites) and Limestone pavements. These habitats are listed on Annex I of the EU Habitats Directive.
Clare Glen SAC	000930	Designated for Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles and <i>Trichomanes speciosum</i> (Killarney Fern). This habitat is listed on Annex I of the EU Habitats Directive and Killarney Fern is listed in Annex II and IV of the Habitats Directive.
Cloonmoylan Bog SAC	000248	Designated for Active raised bogs, Degraded raised bogs still capable of natural regeneration, Depressions on peat substrates of the Rhynchosporion and Bog woodland. These habitats are listed on Annex I of the EU Habitats Directive.
Connemara Bog Complex SAC	002034	Designated for Coastal lagoons, Reefs, Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>), Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> , Natural dystrophic lakes and ponds, Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation, Northern Atlantic wet heaths with <i>Erica tetralix</i> , European dry heaths, Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>), Blanket bogs (* if active bog), Transition mires and quaking bogs, Depressions on peat substrates of the Rhynchosporion, Alkaline fens, Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles, <i>Euphydryas aurinia</i> (Marsh Fritillary), <i>Salmo salar</i> (Salmon), <i>Lutra lutra</i> (Otter) and <i>Najas flexilis</i> (Slender Naiad). These habitats are listed on Annex I of the EU Habitats Directive. Slender Naiad, Otter and Salmon are listed in Annex II and IV of the Habitats Directive. Marsh Fritillary is listed in Annex II of the Habitats Directive.
Coole-Garryland Complex SAC	000252	Designated for Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation, Turloughs, Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidenton</i> p.p. vegetation, <i>Juniperus communis</i> formations on heaths or calcareous grasslands, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites), Limestone pavements and <i>Taxus baccata</i> woods of the British Isles. These habitats are listed on Annex I of the EU Habitats Directive.

Designated SAC	Site Code	Qualifying Interests
Curraghchase Woods SAC	000174	Designated for Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>), <i>Taxus baccata</i> woods of the British Isles, <i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) and <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat). These habitats are listed on Annex I of the EU Habitats Directive. Desmoulin's Whorl Snail is listed in Annex II of the Habitats Directive and Lesser Horseshoe Bat are listed in Annex II and IV of the Habitats Directive.
Derrycrag Wood Nature Reserve SAC	000261	Designated for Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. This habitat is listed on Annex I of the EU Habitats Directive.
Drummin Wood SAC	002181	Designated for Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. This habitat is listed on Annex I of the EU Habitats Directive.
Glenstal Wood SAC	001432	Designated for <i>Trichomanes speciosum</i> (Killarney Fern). This habitat is listed on Annex I of the EU Habitats Directive.
Gortacarnaun Wood SAC	002180	Designated for Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles. This habitat is listed on Annex I of the EU Habitats Directive.
Inisheer Island SAC	001275	Designated for Coastal lagoons, Reefs, European dry heaths, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites), Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>) and Limestone pavements. This habitat is listed on Annex I of the EU Habitats Directive.
Inishmaan Island SAC	000212	Designated for Reefs, Perennial vegetation of stony banks, Vegetated sea cliffs of the Atlantic and Baltic coasts, Embryonic shifting dunes, Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes), Machairs (* in Ireland), European dry heaths, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites), Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>) and Limestone pavements. These habitats are listed on Annex I of the EU Habitats Directive.
Inishmore Island SAC	000213	Designated for Coastal lagoons, Reefs, Perennial vegetation of stony banks, Vegetated sea cliffs of the Atlantic and Baltic coasts, Embryonic shifting dunes, Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes), Fixed coastal dunes with herbaceous vegetation (grey dunes), Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>), Humid dune slacks, Machairs, European dry heaths, Alpine and Boreal heaths, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites), Lowland hay meadows (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>), Limestone pavements, Submerged or partially submerged sea caves and <i>Vertigo angustior</i> (Narrow-mouthed Whorl Snail). These habitats are listed on Annex I of the EU Habitats Directive. Narrow-mouthed Whorl Snail is listed in Annex II of the Habitats Directive.
Keeper Hill SAC	001197	Designated for Northern Atlantic wet heaths with <i>Erica tetralix</i> and Blanket bogs (*if active bog). These habitats are listed on Annex I of the EU Habitats Directive.
Kerry Head Shoal SAC	002263	Designated for Reefs. This habitat is listed on Annex I of the EU Habitats Directive.
Kiltartan Cave (Coole) SAC	000286	Designated for Caves do not open to the public and <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat). This habitat is listed on Annex I of the EU Habitats Directive. Lesser Horseshoe Bat is listed in Annex II and Annex IV of the Habitats Directive.
Kiltiernan Turlough SAC	001285	Designated for the presence of a turlough. Turloughs are listed on Annex I of the EU Habitats Directive.
Lough Corrib SAC	000297	Designated for Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>), Oligotrophic to mesotrophic

Designated SAC	Site Code	Qualifying Interests
		<p>standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoetes-Nanojuncetea</i>, Hard oligo-mesotrophic waters with benthic vegetation of Chara spp., Water courses of plain to montane levels with the <i>Ranunculum fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites), Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>), Active raised bogs, Degraded raised bogs still capable of natural regeneration, Depressions on peat substrates of the Rhynchosporion, Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>, Petrifying springs with tufa formation (Cratoneurion), Alkaline fens, Limestone pavements, Old sessile oak woods with Ilex and Blechnum in the British Isles, Bog woodland,</p> <p><i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel), <i>Austropotamobius pallipes</i> (White-clawed Crayfish), <i>Petromyzon marinus</i> (Sea Lamprey), <i>Lampetra planeri</i> (Brook Lamprey), <i>Salmo salar</i> (Salmon), <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat), <i>Lutra lutra</i> (Otter), <i>Najas flexilis</i> (Slender Naiad), <i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]</p> <p>These habitats are listed on Annex I of the EU Habitats Directive. Freshwater Pearl Mussel, White Clawed Crayfish, Salmon, Otter, Slender Naiad are listed in Annex II and Annex IV of the Habitats Directive. Sea lamprey, Brook Lamprey and Slender Green Feather-Moss are listed in Annex II of the Habitats Directive.</p>
Lough Coy SAC	002117	Designated for the presence of a turlough. Turloughs are listed on Annex I of the EU Habitats Directive.
Lough Cutra SAC	000299	Designated for <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat). Lesser Horseshoe Bat is listed in Annex II and Annex IV of the Habitats Directive
Lough Derg, North-east Shore SAC	002241	Designated for Juniperus communis formations on heaths or calcareous grasslands, Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> , Alkaline fens, Limestone pavements, Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) and <i>Taxus baccata</i> woods of the British Isles. These habitats are listed on Annex I of the EU Habitats Directive.
Lough Fingall Complex SAC	000606	Designated for Turloughs, Alpine and Boreal heaths, <i>Juniperus communis</i> formations on heaths or calcareous grasslands, Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites), Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> , Limestone pavements and <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat). These habitats are listed on Annex I of the EU Habitats Directive. Lesser Horseshoe Bat is listed in Annex II and Annex IV of the Habitats Directive
Moanveanlagh Bog SAC	002351	Designated for Active raised bogs, Degraded raised bogs still capable of natural regeneration and Depressions on peat substrates of the Rhynchosporion. These habitats are listed on Annex I of the EU Habitats Directive
Peterswell Turlough SAC	000318	Designated for the presence of a turlough and Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and Bidetion p.p. vegetation. These habitats are listed in Annex I of the EU Habitats Directive.
Pollnacknockaun Wood Nature Reserve SAC	000319	Designated for Old sessile oak woods with Ilex and Blechnum in the British Isles. This habitat is listed on Annex I of the EU Habitats Directive.
River Shannon Callows SAC	000216	<p>Designated for Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) , Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>), Alkaline fens, Limestone pavements, Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) and <i>Lutra lutra</i> (Otter).</p> <p>These habitats are listed on Annex I of the EU Habitats Directive.</p>

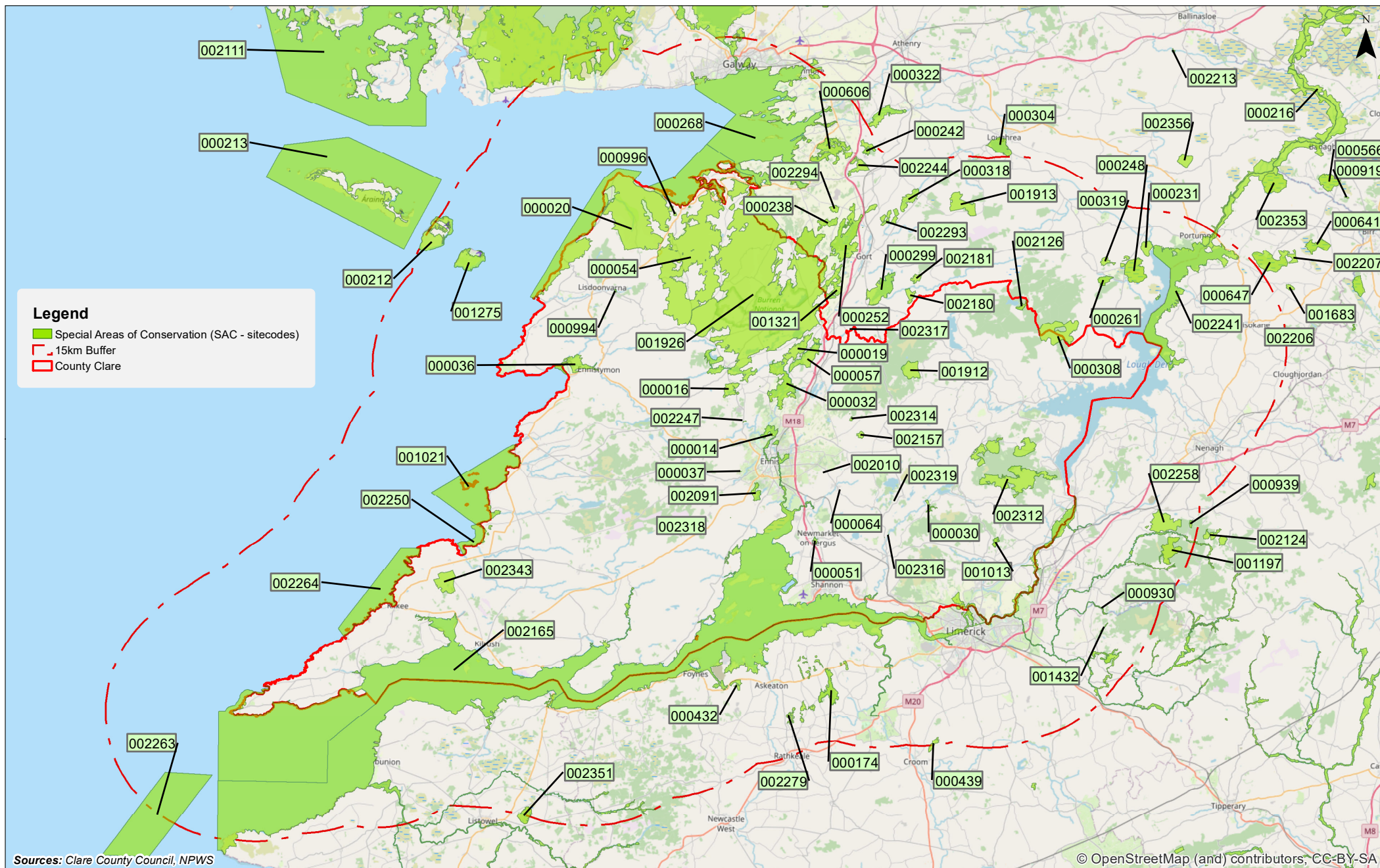
Designated SAC	Site Code	Qualifying Interests
		Otter is listed in Annex II and Annex IV of the Habitats Directive.
Rosturra Wood SAC	001313	Designated for Old sessile oak woods with Ilex and Blechnum in the British Isles. This habitat is listed on Annex I of the EU Habitats Directive.
Scohaboy (Sopwell) Bog SAC	002206	Designated for Degraded raised bogs still capable of natural regeneration. This habitat is listed on Annex I of the EU Habitats Directive.
Silvermine Mountains SAC	000939	Designated for Northern Atlantic wet heaths with <i>Erica tetralix</i> and Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe). These habitats are listed on Annex I of the EU Habitats Directive.
Silvermines Mountains West SAC	002258	Designated for Northern Atlantic wet heaths with <i>Erica tetralix</i> , European dry heaths and Calaminarian grasslands of the <i>Violetalia calaminariae</i> . These habitats are listed on Annex I of the EU Habitats Directive.
Sonnagh Bog SAC	001913	Designated for Blanket bogs (* if active bog). This habitat is listed on Annex I of the EU Habitats Directive.
Tory Hill SAC	000439	Designated for Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites), Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> and Alkaline fens. These habitats are listed on Annex I of the EU Habitats Directive.

Table 5.6.2: List of Special Protection Areas (SPAs) in the Clare County Development Plan Area

Designated SPA	Site Code	Reason for Designation
Cliffs of Moher SPA	004005	This site is significant for the presence of the Breeding Peregrine (<i>Falco peregrinus</i>) and the Chough (<i>Pyrrhocorax pyrrhocorax</i>) which are listed under Annex I of the EU Birds Directive. It is also designated for the presence of Fulmar (<i>Fulmarus glacialis</i>), Kittiwake (<i>Rissa tridactyla</i>), Guillemot (<i>Uria aalge</i>), Razorbill (<i>Alca torda</i>), and Puffin (<i>Fratercula arctica</i>). This site has the largest Kittiwake (<i>Rissa tridactyla</i>) and Razorbill (<i>Alca torda</i>) colonies in Ireland.
Inner Galway Bay SPA & Ramsar Site	004031	Designated for the presence of the following species which are listed under Annex I of the EU Birds Directive: Red-throated Diver (<i>Gavia stellata</i>), Black-throated Diver (<i>Gavia arctica</i>), Great Northern Diver (<i>Gavia immer</i>), Golden Plover (<i>Pluvialis apricaria</i>), Bar-tailed Godwit (<i>Limosa ponica</i>), Sandwich Tern (<i>Sterna sandvicensis</i>) and Common Tern (<i>Sterna hirundo</i>). Also found at this site are the Cormorant (<i>Phalacrocorax carbo</i>), Grey Heron (<i>Ardea cinerea</i>), Light-Bellied Brent Goose (<i>Branta bernicla hrota</i>), Wigeon (<i>Anas penelope</i>), Teal (<i>Anas crecca</i>), Shoveler (<i>Anas clypeata</i>), Red-breasted Merganser (<i>Mergus serrator</i>), Ringed Plover (<i>Charadrius hiaticula</i>), Golden Plover (<i>Pluvialis apricaria</i>), Northern Lapwing (<i>Vanellus vanellus</i>), Dunlin (<i>Calidris alpina</i>), Curlew (<i>Numenius arquata</i>), Redshank (<i>Tringa tetanus</i>), Turnstone (<i>Arenaria interpres</i>), Black-headed Gull (<i>Chroicocephalus ridibundus</i>) and the Common Gull (<i>Larus canus</i>).
Ballyallia Lake Wildfowl Sanctuary SPA	004041	This site is significant as the Whooper Swan (<i>Cygnus Cygnus</i>), a species listed under Annex I of the EU Birds Directive can be located here. In addition, the Shoveler (<i>Anas</i>) population is the largest in Ireland and the Gadwall (<i>Anas strepera</i>) population is also highly significant.
Lough Derg (Shannon) SPA	004058	Designated for the presence of the Common Tern (<i>Sterna hirundo</i>), Whooper Swan (<i>Cygnus Cygnus</i>) and the Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) which are listed under Annex I of the EU Birds Directive. The site also has nationally breeding populations of Cormorant (<i>Phalacrocorax carbo</i>) and specifically during winter there are significant

Designated SPA	Site Code	Reason for Designation
		populations of Tufted Duck (<i>Aythya fuligula</i>) and Goldeneye (<i>Bucephala clangula</i>).
River Shannon and River Fergus Estuaries SPA	004077	The following species listed under Annex I of the EU Birds Directive can be found at this site: Whooper Swan (<i>Cygnus Cygnus</i>), Golden Plover (<i>Pluvialis apricaria</i>) and the Bar-tailed Godwit (<i>Limosa lapponica</i>). In addition, it has internationally important populations of Dunlin (<i>Calidris alpina</i>), Black-tailed Godwit (<i>Limosa limosa</i>) and Redshank (<i>Tringa totanus</i>). In addition, the following species can also be found at this location: Cormorant (<i>Phalacrocorax carbo</i>), Light-bellied Brent Goose (<i>Branta bernicla hrota</i>), Shelduck (<i>Tadorna tadorna</i>), Wigeon (<i>Anas penelope</i>), Teal (<i>Anas crecca</i>), Pintail (<i>Anas acuta</i>), Shoveler (<i>Anas clypeata</i>), Scaup (<i>Aythya marila</i>), Ringed Plover (<i>Charadrius hiaticula</i>), Grey Plover (<i>Pluvialis squatarola</i>), Northern Lapwing (<i>Vanellus vanellus</i>), Knot (<i>Calidris canutus</i>), Curlew (<i>Numenius arquata</i>), Greenshank (<i>Tringa nebularia</i>) and the Black-headed Gull (<i>Chroicocephalus ridibundus</i>).
Illanonearaun SPA	004114	Designated for the presence of the Barnacle Goose (<i>Branta leucopsis</i>), a species listed under Annex I of the EU Birds Directive. The population of Barnacle Geese at this site often exceeds the qualifying threshold for National Importance.
Loop Head SPA	004119	This site is significant for the presence of breeding Chough (<i>Pyrrhocorax pyrrhocorax</i>) and Peregrine (<i>Falco peregrinus</i>), species listed under Annex I of the EU Birds Directive. The site also has populations of Kittiwake (<i>Rissa tridactyla</i>) and Guillemot (<i>Uria aalge</i>) which are of National Importance.
Slieve Aughty Mountains SPA	004168	Designated for the presence of the Hen Harrier (<i>Circus cyaneus</i>), a species listed under Annex I of the EU Birds Directive. This is the second largest concentration for this species in Ireland. Another Annex I species, Merlin (<i>Falco columbarius</i>) can be found at this site.
Mid-Clare Coast SPA	004182	Significant species at this site include the Barnacle Goose (<i>Branta leucopsis</i>), Storm Petrel (<i>Hydrobates pelagicus</i>), Golden Plover (<i>Pluvialis apricaria</i>), Great Northern Diver (<i>Gavia immer</i>), and Red-throated Diver (<i>Gavia stellata</i>) which are listed under Annex I of the EU Birds Directive. It has a nationally important breeding colony of Cormorant (<i>Phalacrocorax carbo</i>) during the summer. It is also an important site for the presence of Ringed Plover (<i>Charadrius hiaticula</i>), Sanderling,
Corofin Wetlands SPA	004220	Designated for the presence of the Whooper Swan (<i>Cygnus Cygnus</i>) and the Golden Plover (<i>Pluvialis apricaria</i>) were listed under Annex I of the EU Birds Directive. In addition, the site supports nationally important populations of Little Grebe (<i>Tachybaptus ruficollis</i>), Wigeon (<i>Anas penelope</i>), Teal (<i>Anas crecca</i>) and the Black-tailed Godwit (<i>Limosa limosa</i>).
Connemara Bog Complex SPA	004181	Designated for the presence of SCI birds Cormorant (<i>Phalacrocorax carbo</i>), Merlin (<i>Falco columbarius</i>), Golden Plover (<i>Pluvialis apricaria</i>) and Common Gull (<i>Larus canus</i>).
Coole-Garryland SPA	004107	Designated for the presence of SCI birds Whooper Swan (<i>Cygnus cygnus</i>). The site is of international importance for Whooper Swan (214), which utilise it for both feeding and roosting purposes
Cregganna Marsh SPA	004142	Designated for the presence of SCI birds Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>). The site is of major conservation importance as a feeding site for a nationally important flock of Greenland White-fronted Goose (157 – 5 year mean peak between 1994/95 and 1998/99. The birds using this site form part of the Rahasane flock.
Inishmore SPA		Designated for the presence of SCI birds Kittiwake (<i>Rissa tridactyla</i>), Arctic Tern (<i>Sterna paradisaea</i>), Little Tern (<i>Sterna albifrons</i>) and Guillemot (<i>Uria aalge</i>).
Kerry Head SPA	004189	Designated for the presence of SCI birds Fulmar (<i>Fulmarus glacialis</i>) and Chough (<i>Pyrrhocorax pyrrhocorax</i>). The site supports an internationally important population of breeding Chough, a Red Data Book species that is listed on Annex I of the E.U. Birds Directive; 32 breeding pairs were recorded from the site in the 1992 survey and 30 in the 2002/03 survey. In addition, a flock of 20 birds was noted on the northern coast of the site

Designated SPA	Site Code	Reason for Designation
		during the latter survey. The site is of particular note for the density of breeding pairs found. The site also supports a nationally important population of Fulmar (421 pairs).
Lough Corrib SPA	004042	Designated for the presence of SCI birds Gadwall (<i>Anas strepera</i>), Shoveler (<i>Anas clypeata</i>), Pochard (<i>Aythya ferina</i>), Tufted Duck (<i>Aythya fuligula</i>), Common Scoter (<i>Melanitta nigra</i>), Hen Harrier (<i>Circus cyaneus</i>), Coot (<i>Fulica atra</i>), Golden Plover (<i>Pluvialis apricaria</i>), Black-headed Gull (<i>Chroicocephalus ridibundus</i>), Common Gull (<i>Larus canus</i>), Common Tern (<i>Sterna hirundo</i>), Arctic Tern (<i>Sterna paradisaea</i>) and Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>).
Lough Cutra SPA	004056	Designated for the presence of SCI birds Cormorant (<i>Phalacrocorax carbo</i>). Lough Cutra is a long-established breeding site for Cormorant (166 pairs in 1985) although numbers have declined in recent years (34 pairs in 1996). The birds breed on Parsons Island and appear to commute to the coast for feeding.
Middle Shannon Callows SPA	004096	Designated for the presence of SCI birds Whooper Swan (<i>Cygnus cygnus</i>), Wigeon (<i>Anas penelope</i>), Corncrake (<i>Crex crex</i>), Golden Plover (<i>Pluvialis apricaria</i>), Lapwing (<i>Vanellus vanellus</i>), Black-tailed Godwit (<i>Limosa limosa</i>) and Black-headed Gull (<i>Chroicocephalus ridibundus</i>).
Slievefelim to Silvermines Mountains SPA	004165	Designated for the presence of SCI bird Hen Harrier (<i>Circus cyaneus</i>).
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	004161	Designated for the presence of SCI bird Hen Harrier (<i>Circus cyaneus</i>).



A full assessment of the RES against the qualifying interests and conservation objectives of the designated sites is undertaken throughout the appropriate assessment process which has been undertaken in conjunction with the CDP Plan (including the RES) and SEA processes and is presented in the Natura Impact Report (available under separate cover).

5.6.5 Proposed Natural Heritage Areas

Under the Wildlife Amendment Act (2000), Natural Heritage Areas are legally protected from damage from the date they are formally proposed for designation. The aim of the NHA network is to conserve and protect nationally important plant and animal species and their habitats. They are also designated to conserve and protect nationally important landforms, geological or geomorphological features. Planning authorities are obliged by law to ensure that these sites are protected and conserved. NHAs and pNHAs, although not part of the European network, often provide an important supporting role to it. Therefore, in order to protect the European network it may be important to protect the NHA/pNHAs. Article 10 of the Habitats Directive together with the Habitats Regulations 2011; place a high degree of importance on these sites as features that connect European sites. There are 14 NHAs and 61 pNHAs within and adjacent to the Development Plan area and are listed in **Table 5.6.3** and **Table 5.6.4** and shown in **Figure 5.6-3** and **Figure 5.6-4**.

Table 5.6.3: List of Natural Heritage Areas (NHA) in the Clare County Development Plan Area

Designated NHA	Site Code	Reasons for Designation
Doon Lough Bog NHA	000337	This site consists of raised bog which is a rare habitat within the EU. This NHA is of significant importance due to its location. It is one of the most westerly raised bogs in Ireland.
Ayle Lower Bog NHA	000993	A raised bog which is a rare habitat within the EU can be found at this location This NHA is of significant importance due to its location. It is one of the most westerly raised bogs in Ireland and it seems to have semi-natural margins along the stream that flows through it.
Illaunonearaun NHA	001014	The island is regularly used in winter by a Barnacle Goose flock. Flock size varies as birds move between here and Mutton Island to the north; up to 200 birds have been recorded (as, for example, in spring 1988), but numbers are usually less than this, such as in 1994 (22 birds) and 1998 (142 birds). The island is an important breeding site for seabirds. A Cormorant colony was established in the 1970s and 60 individuals were recorded in 1995. Other species which breed include Fulmar (10 pairs in 1993), Great Black-backed Gull (c. 25 pairs), Lesser Black-backed Gull (35 pairs in 1999) and Herring Gull (6 pairs in 2002).
Loughanilloon Bog NHA	001020	This site consists of raised bog which is a rare habitat within the EU. It supports a range of microhabitats, including hummocks and a flush. The diversity of the site is enhanced by the presence of a lake.
Slieve Aughty Bog NHA	001229	Supports a significant area of upland blanket bog, a globally scarce resource.
Cloonloun More Bog NHA	002307	A raised bog which is a rare habitat within the EU can be found at this location This NHA is of significant importance due to its location as it is one of the few remaining raised bogs in the County.
Lough Naminna Bog NHA	002367	This site is of significant conservation interest as it consists of an upland blanket bog. It is a globally scarce resource.
Lough Atorick District Bogs NHA	002377	Designated for the presence of upland blanket bog with intermediary characteristics between blanket and raised bog types.
Slievecallan Mountain Bog NHA	002397	This site contains an upland blanket bog and is one of the few intact areas of blanket bog in the County. A diverse range of flora and fauna can be found at this location.
Cragnashingaun Bogs NHA	002400	It consists of both upland and lowland blanket bog. A diversity of flora and fauna can be found within a range of blanket bog microhabitats at this location.
Gortacullin Bog NHA	002401	Designated for the presence of upland blanket bog and wet heath. A range of blanket bog microhabitats such as hummock/ hollow complexes,

Designated NHA	Site Code	Reasons for Designation
		flushes and regenerating cutover with willow and birch scrub can be found here.
Woodcock Hill Bog NHA	002402	This site consists of upland blanket bog which is a globally scarce resource. Wet heath can also be found here.
Lough Acrow Bogs NHA	002421	Designated for the presence of upland blanket bog. A range of microhabitats can be found here including a deep, wet bog associated with a well-developed pool complex.
Oysterman's Marsh NHA	002439	This site contains a significant area of lowland blanket bog, a globally scarce resource.
Maghera Mountain Bogs NHA	002442	Consists of a diversity of habitats such as heath, flush, scrub and upland blanket bog which is the dominant habitat.
Bleanbeg Bog NHA	002450	Bleanbeg Bog NHA consists primarily of upland blanket bog and is located approximately 7 km east of Newport in south Tipperary
Bunnaruddee Bog NHA	001352	The site comprises a raised bog that includes both areas of high bog and cutover bog. The site is surrounded by streams to the east and west and a river to the south.
Carrigkerry Bogs NHA	002399	Carrigkerry Bogs NHA consists of two upland blanket bogs that are both located within 2.5 km of the village of Carrigkerry, Co. Limerick.
Cregganna Marsh NHA	000253	The predominant habitats on the site are lowland wet grassland and improved grassland, but areas of limestone pavement and other exposed rock, Hazel (<i>Corylus avellana</i>) scrub, freshwater marsh, drainage ditches and dry grassland are also represented.
Derryoover Bog NHA	002379	Derryoover Bog NHA is a lowland blanket bog situated approximately 2 km east of Lough Derg and 5 km south of Woodford in east Co. Galway. The site contains an extensive area of lowland blanket bog that has formed in depressions between low-lying hills and lies between an altitude range of 50 m to 100m
Grageen Fen And Bog NHA	002186	Grageen Fen and Bog NHA is an upland bog and alkaline fen located on the southern side of the Slievefelim Mountains, approximately 6 km east of Moroe and 7 km south-east of Newport, Co. Limerick
Moycullen Bogs NHA	002364	Moycullen Bogs NHA is an extensive lowland blanket bog located 5 km west of Galway City in Co. Galway.
Moyreen Bog NHA	002361	Moyreen Bog NHA is an area of lowland blanket bog located 8 km south east of Glin, 7 km south of Loughill and 10 km south west of Foynes in the townland of Moyreen in north Co. Limerick.
Scohaboy Bog NHA	000937	Scohaboy Bog NHA is a large raised bog situated 4 km south-east of Borrisokane, in County Tipperary. The site comprises a relatively large raised bog that includes both areas of high bog and cutover

Table 5.6.4: List of Proposed Natural Heritage Areas (pNHA) in the Clare County Development Plan Area

Proposed Natural Heritage Area	Site Code	Reason for Designation
Lough Derg pNHA	000011	Description of pNHA not available, see Lough Derg (Shannon) SPA description.
Ballyallia Lake pNHA	000014	Description of pNHA not available, see Ballyallia Lake SAC.
Ballycar Lough pNHA	000015	This is a small calcareous lake. It has a considerable ecological value which stems from the transitory state of the fen vegetation on the northern limb. At this site, bog vegetation such as the Bog-myrtle (<i>Myrica gale</i>) and the Purple Moor-grass (<i>Molinia caerulea</i>) has invaded a fen community so that conditions are finely balanced between the two.

Proposed Natural Heritage Area	Site Code	Reason for Designation
Ballycullinan Lake pNHA	000016	Description of pNHA not available, see Ballycullinan Lake SAC description.
Ballyogan Lough pNHA	000019	Description of pNHA not available, see Ballyogan Lough SAC description.
Black Head-Poulsallagh Complex pNHA	000020	Description of pNHA not available, see Black Head- Poulsallagh Complex SAC description.
Cahermurphy Wood pNHA	000022	The conservation value of this site comes from the presence of oak woodland which is on relatively fertile soil. Ireland has very few areas of this woodland.
Cliffs of Moher pNHA	000026	Description of pNHA not available, see Cliffs of Moher SPA description
Clonderalaw Bay pNHA	000027	Description of pNHA not available.
Cloonlara House pNHA	000028	This is a site of international importance and is one of the biggest nursery sites in Ireland and Europe for the Leisler Bat (<i>Nyctalus leisleri</i>).
Danes Hole, Poulnalecka pNHA	000030	Description of pNHA not available, see description of Danes Hole, Poulnalecka SAC.
Dromore Woods and Loughs pNHA	000032	Description of pNHA not available, see description of Dromore Woods and Loughs SAC.
Durra Castle pNHA	000033	Its significance lies in the fact that it is one of the few nursery sites at the eastern edge of the distribution of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) in Ireland. There is also a suitable foraging habitat in close proximity to the site.
Fort Fergus (Ballynaccally) NHA	000035	This site is of national importance for the presence of the Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>). It is one of the few known areas in Munster where this species is found.
Inagh River Estuary	000036	Description of pNHA not available, see description of Inagh River Estuary SAC.
Pouladatig Cave	000037	Description of pNHA not available, see description of Pouladatig Cave SAC.
Inchicronan Lough pNHA	000038	A wide range of habitats can be found around the lake and include an area of cut-over bog to the north, Ash (<i>Fraxinus excelsior</i>) and Hazel (<i>Corylus avellana</i>) woodland along the eastern shore, a complex mosaic of wet grassland, dense scrub and marsh at the southern end and a habitat of significant interest on the western side of the lake due to the presence of the Limerick-Sligo railway line.
Loop Head pNHA	000045	No description of pNHA available, see description of Loop Head SPA.
Lough Goller pNHA	000048	This site is designated for the presence of the Spring Quillwort (<i>Isoetes echinospora</i>) growing on the southern shore of the lake and is a rare plant in Ireland.
Derrygeeha Lough pNHA	000050	This is only one of two stations at which the rare Caddisfly (<i>Cyrmus insolutus</i>) can be found in Ireland. It is a site of international importance.
Lough Gash Turlough pNHA	000051	Description of pNHA not available, see description of Lough Gash Turlough SAC.
Moneen Mountain pNHA	000054	Description of pNHA not available, see description of Moneen Mountain SAC.
Moyree River System pNHA	000057	Description of pNHA not available, see description of Moyree River System SAC.
Newpark House (Ennis) pNHA	000061	Description not available.

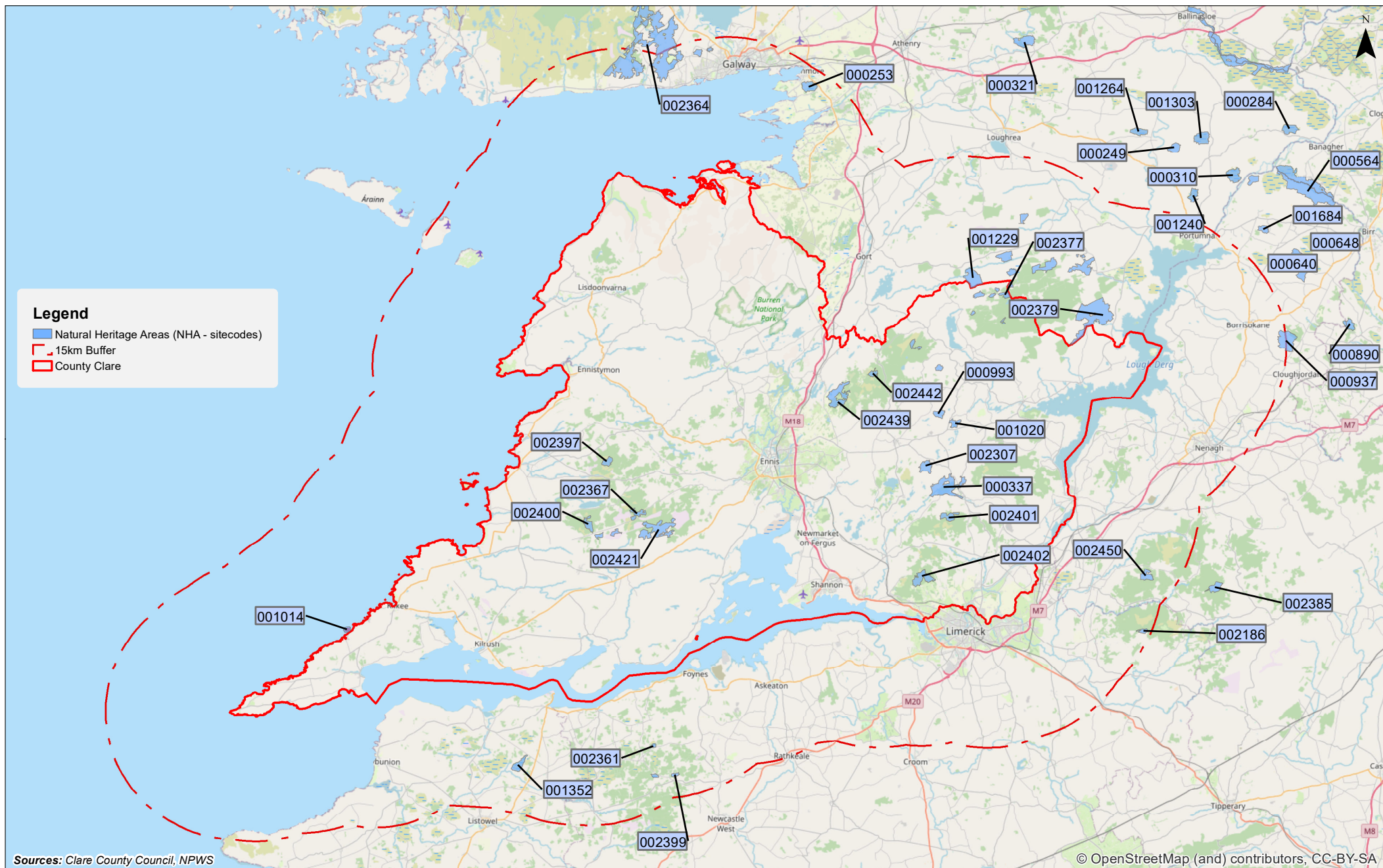
Proposed Natural Heritage Area	Site Code	Reason for Designation
Paradise House (Ballynacally) pNHA	000062	A site of national importance as it is one of the few Lesser Horseshoe Bat (<i>Rhinolophus hipposideros</i>) roosts known in this area of Munster.
Poulnagordon Cave (Quin) pNHA	000064	Description of pNHA not available, see description of Poulnagordon Cave SAC.
Poulnasherry Bay pNHA	000065	Description not available.
Tullaheer Lough and Bog NHA	000070	Description of pNHA not available, see description of Tullaheer Lough and Bog SAC.
Turloughnagullaun pNHA	000071	This is a diverse turlough in topography and vegetation. It contains rare and unusual plant species including the Red Data Book species Fen Violet (<i>Viola persicifolia</i>) is located here.
Farrihy Lough pNHA	000200	Consists of a brackish lake which is of great importance to large numbers of waders and duck during winter. This site has a good range of habitats supporting a variety of floral species. The influence of the sea is reflected in the vegetation with many maritime species recorded from the area which include Thrift (<i>Armeria maritima</i>), Buck's-horn Plantain (<i>Plantago coronopus</i>) and Common Scurvygrass (<i>Cochlearia officinalis</i>).
Castle Lake pNHA	000239	This site consists of diversity of wetland and woodland habitats which range from open water and reed-beds to lakeside wet deciduous woodland to ash/oak woodland and scrub to species-rich wet fields and marsh.
Galway Bay Complex pNHA	000268	Description of pNHA not available, see description of Galway Bay Complex SAC.
Loughatorick South Bog pNHA	000308	Description of pNHA not available, see description of Loughatorick South Bog SAC.
Ballyteige (Clare) pNHA	000994	Description of pNHA not available, see description of Ballyteige (Clare) SAC.
Ballyvaughan Turlough pNHA	000996	Description of pNHA not available, see description of Ballyvaughan Turlough SAC.
Cahiracon Wood pNHA	001000	Description not available.
Cahiracalla Wood pNHA	001001	It is a great example of relatively intact mostly native woodland. The presence of scrub, wet woodland and limestone pavement provides for habitat diversity at this location.
Cloonsnaghta Lough pNHA	001004	This site is significant as a population of Arctic Char (<i>Salvelinus alpinus</i>) can be found here. This species is listed in the Irish Red Data Book.
White Strand/ Carrowmore Marsh pNHA	001007	Description not available.
Dromoland Lough pNHA	001008	Designated for the presence of a diverse range of marsh species which include Bottle Sedge (<i>Carex rostrata</i>), Slender Sedge (<i>C. lasiocarpa</i>), Tufted-sedge (<i>C. elata</i>), Lesser Tussock-sedge (<i>C. diandra</i>), Greater Pond-sedge (<i>C. riparia</i>), Fibrous Tussock-sedge (<i>C. appropinquata</i>), Long-stalked. Yellow-sedge (<i>C. lepidocarpa</i>), Reed Canary grass (<i>Phalaris arundinacea</i>), Grass-of-parnassus (<i>Parnassia palustris</i>) and Eyebright (<i>Euphrasia scottica</i>).
Fin Lough (Clare) pNHA	001010	The beetle, <i>Panagaeus cruxmajor</i> has been recorded twice at this location. This is one of a small number of stations for this insect in Ireland.
Garrannon Wood pNHA	001012	This site is significant as it has a fairly intact and mature oak (<i>Quercus spp</i>) wood.
Glenomra Wood pNHA	001013	Description of pNHA not available, see description of Glenomra Wood SAC.
Gortglass Lough pNHA	001015	Designated for the presence of the Arctic Char (<i>Salvelinus alpinus</i>). In addition, it is a good example of an acid lake with typical surrounding vegetation.

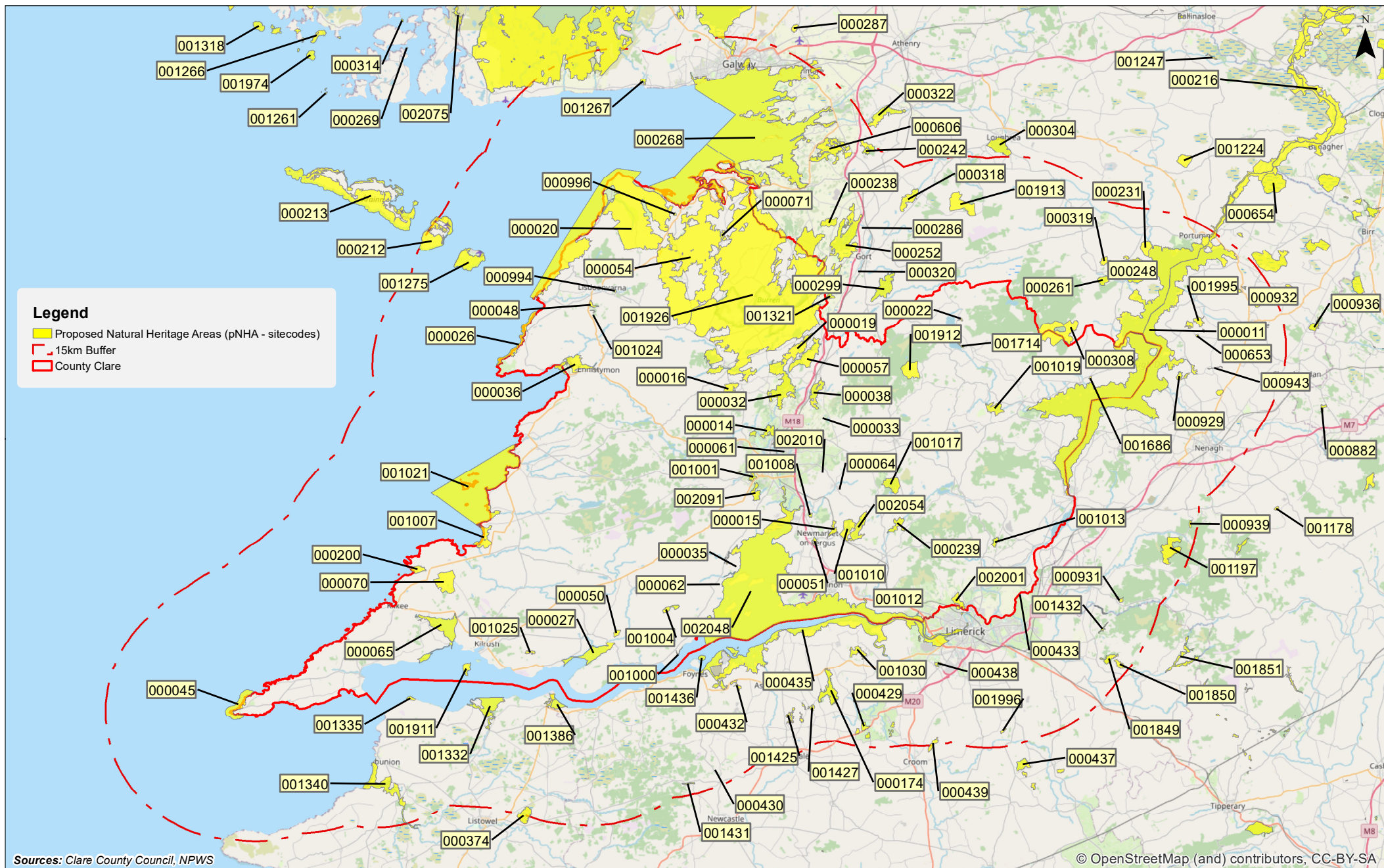
Proposed Natural Heritage Area	Site Code	Reason for Designation
Lough Cullaunyeeda pNHA	001017	This site contains nationally important numbers of Tufted Duck (<i>Aythya fuligula</i>) and Coot (<i>Fulica atra</i>).
Lough O'Grady pNHA	001019	Designated for the presence of Greenland White-fronted Geese (<i>Anser albifrons flavirostris</i>). It also contains a diverse range of habitats which include open water, wet grassland/ marsh, wet woodland and scrub.
Carrowmore Point to Spanish Point and Islands pNHA	001021	Description of pNHA not available, see description of Carrowmore Point to Spanish Point and Islands SAC.
Caherkinallia Wood pNHA	001024	This site is significant as it contains one of the few remaining deciduous woodlands in this area of Clare. The Sessile Oak (<i>Quercus petraea</i>) is the most dominant species. A lower canopy of wood consists of Hazel (<i>Corylus avellana</i>), Holly (<i>Ilex aquifolium</i>), Downy Birch (<i>Betula pubescens</i>) and Rowan (<i>Sorbus aucuparia</i>).
St. Senan's Lough pNHA	001025	Designated for the presence of a significant marsh habitat which contains peat-forming Sphagnum moss (<i>Sphagnum spp.</i>) and cut-away bog.
Termon Lough pNHA	001321	Description of pNHA not available.
Lough Cleggan pNHA	001331	This site has a diverse range of habitats and plant species which include the Common Reed (<i>Phragmites australis</i>), Bottle Sedge (<i>Carex rostrata</i>), Yellow Irish (<i>Iris pseudacorus</i>), Hazel (<i>Corylus avellana</i>), Willow (<i>Salix spp.</i>), Ash (<i>Fraxinus excelsior</i>), Rushes (<i>Juncus spp.</i>), Marshmarigold (<i>Caltha palustris</i>), and Meadowsweet (<i>Filipendula ulmaria</i>). The lake is of local importance for wintering waterfowl. Breeding bird species include the Tufted Duck (<i>Aythya fuligula</i>) and Coot (<i>Fulica atra</i>).
Cloonamirran Wood pNHA	001686	A good example of the relatively rare habitat – wet mixed deciduous woodland on raised bog. It is also a fine example of plant succession.
Lough Graney Woods pNHA	001714	This site is significant as it contains acid woodland where succession and regeneration is occurring naturally. The wood is a native mixed woodland
Scattery Island pNHA	001911	Description not available.
Glendree Bog pNHA	001912	Description of pNHA not available, see description of Glendree Bog SAC.
East Burren Complex pNHA	001926	Description of pNHA not available, see description of East Burren Complex SAC.
Knockalisheen Marsh pNHA	002001	The site is of high ecological value in that it is a good example of unimproved pasture and wetland with good botanical diversity. This habitat type is now scarce, particularly so close to an urban environment. The site is notable for the presence of several species of orchid, including Marsh Helleborine (<i>Epipactis palustris</i>). There is also a colony of Skullcap (<i>Scutellaria galericulata</i>), a wetland plant which is rare in County Clare.
Old Domestic Building (Keevagh) pNHA	002010	Description of pNHA not available, see description of Old Domestic Building (Keevagh) SAC.
Fergus Estuary and Inner Shannon, North Shore pNHA	002048	Description not available.
Rosroe Lough pNHA	002054	Designated for the presence of Holly (<i>Ilex aquifolium</i>) -dominated scrub and associated grassland. This location contains a finely struck balance between the requirements of moisture and acid-loving species and those requiring a more demanding dry, alkaline regime.
Newhall and Edenvale Complex pNHA	002091	Description of pNHA not available, see description of Newhall and Edenvale Complex SAC.

Proposed Natural Heritage Area	Site Code	Reason for Designation
Adare Woodlands pNHA	000429	Designated for Woodlands containing species such as Sessile Oak (<i>Quercus petraea</i>), Ash (<i>Fraxinus excelsior</i>) and Downy Birch (<i>Betula pubescens</i>) occur, intermingled with exotics such as Turkey Oak (<i>Quercus cerris</i>), Beech (<i>Fagus sylvatica</i>) and Sweet Chestnut (<i>Castanea sativa</i>).
Ardagh Church, Newcastlewest (Disused) pNHA	000430	A nursery colony of Natterer's Bat (<i>Myotis nattereri</i>) uses the loft and bell tower of the church. Over 100 bats were counted at the site in 1993 making it one of the biggest in the country.
Ballinvirick Marsh pNHA	001427	Description of pNHA not available, see Askeaton Fen Complex SAC site synopsis
Ballylongford Bay pNHA	001332	Description of pNHA not available, see Lower River Shannon SAC site synopsis
Ballymorrisheen Marsh pNHA	001425	This is a small to medium sized wetland site characterised by three small waterbodies with fen vegetation/habitat along the shores, dominated by Saw Sedge <i>Cladium mariscus</i> and Common Reed <i>Phragmites australis</i> . The conservation importance of this site is in its value as a wildlife refuge in an intensively managed landscape. Because of its Loughs and pools, which vary considerably in size and depth this area contains a wider range of habitat types.
Ballyvorheen Bog pNHA	001849	Description not available.
Barrigone pNHA	000432	Description of pNHA not available, See Barrigone SAC site synopsis.
Barroughter Bog pNHA	000231	Description of pNHA not available, See Barroughter Bog SAC site synopsis.
Beal Point pNHA	001335	Beal Point is a small coastal site and sand dune system on the southern shore of the mouth of the Shannon Estuary.
Caherglassaun Turlough pNHA	000238	Description of pNHA not available, See Caherglassaun Turlough SAC site synopsis.
Cappagh Fen pNHA	001429	Description not available.
Cashen River Estuary pNHA	001340	Description not available.
Castleconnell (Domestic Dwelling, Occupied) pNHA	000433	Description not available.
Castletaylor Complex pNHA	000242	Description of pNHA not available, See Castletaylor Complex SAC site synopsis.
Clare Glen pNHA	000930	Fen containing <i>Tomentypnum nitens</i> , <i>Dumortiera hirsuta</i> , <i>Hygroamblystegium fluviatile</i> and <i>Lejeunea eckloniana</i> .
Clareen Lough pNHA	000929	Description not available.
Cloonmoylan Bog pNHA	000248	Description of pNHA not available, See Cloonmoylan Bog SAC site synopsis.
Connemara Bog Complex pNHA	002034	Description of pNHA not available, See Connemara Bog Complex SAC site synopsis
Coole-Garryland Complex pNHA	000252	Description of pNHA not available, See Coole-Garryland Complex SAC site synopsis
Curraghchase Woods pNHA	000174	Description of pNHA not available, See Curraghchase Woods SAC site synopsis
Derrycrag Wood Nature Reserve pNHA	000261	Description of pNHA not available, See Derrycrag Wood Nature Reserve SAC site synopsis
Derrygareen Heath pNHA	000931	This is a rocky area of shallow peaty soils over Old Red Sandstone geology. The vegetation is that of un-reclaimed heathland, dominated by

Proposed Natural Heritage Area	Site Code	Reason for Designation
		Heather (<i>Calluna vulgaris</i>) with Cross-leaved Heath (<i>Erica tetralix</i>), and grasses such as Common Bent (<i>Agrostis capillaris</i>).
Dromore & Bleach Loughs pNHA	001030	This is a rocky area of shallow peaty soils over Old Red Sandstone geology. The vegetation is that of un-reclaimed heathland, dominated by Heather (<i>Calluna vulgaris</i>) with Cross-leaved Heath (<i>Erica tetralix</i>), and grasses such as Common Bent (<i>Agrostis capillaris</i>).
Dromsallagh Bog pNHA	001850	Dromsallagh Bog is a small site of cutaway raised bog and its associated habitats
Fiagh Bog pNHA	000932	It is not a bog in the true sense but a calcium-rich fen formed over Lower Limestone. Derrinvohil Bog, just to the west, is a lowland raised bog. Together these sites have been proposed for designation as a Natural Heritage Area.
Furbogh Wood pNHA	001267	The site consists of Oak (<i>Quercus</i> spp.) woodland bordering the Furbogh River. The woodland is dominated by Oak with a Hazel (<i>Corylus avellana</i>) and Birch (<i>Betula pubescens</i>) understory. The flora of the woodland is diverse. The foliose lichen <i>Lobaria scrobicularia</i> has been recorded from the woodland.
Glenastar Wood pNHA	001431	This is a small woodland site comprised primarily of Oak (<i>Quercus petraea</i>), and Birch (<i>Betula pubescens</i>). This site is of flora and fauna interest and provides an important wildlife refuge in the region.
Glenstal Wood pNHA	001432	Description of pNHA not available, See Glenstal Wood SAC site synopsis
Gorteennamrock pNHA	001433	This small wetland site is located c. 5km to the south east of Askeaton. Fen habitat present is dominated by Saw Sedge to the north and Common Reed further south. This is considered of conservation significance as a wildlife refuge in an otherwise managed landscape. The fen habitat is of botanical interest and the site may support Otter, <i>Lutra lutra</i>
Inisheer Island pNHA	001275	Description of pNHA not available, See Inisheer Island SAC site synopsis.
Inishmaan Island pNHA	000212	Description of pNHA not available, See Inishmaan Island SAC site synopsis.
Inner Shannon Estuary - South Shore pNHA	000435	This pNHA is part of the River Shannon Estuary and is comprised of extensive intertidal mudflats, fringing reedbeds, swamps, polders, salt marsh and wet marsh habitats; habitats which support many thousands of wading birds and duck. Greenland White-fronted and Greylag Geese frequent the southern shores of the estuary during the winter months. The estuary is also a stronghold for two rare plant species; triangular rush <i>Scirpus triquetus</i> and summer snowflake <i>Leucojum aestivum</i>
Keeper Hill pNHA	001197	Description of pNHA not available, See Keeper Hill SAC site synopsis
Kiltartan Cave (Coole) pNHA	000286	Description of pNHA not available, See Kiltartan Cave (Coole) SAC site synopsis
Kiltiernan Turlough pNHA	001285	Description of pNHA not available, See Kiltiernan Turlough SAC site synopsis
Lough Avan pNHA	001995	Lough Avan is a wetland area situated to the north-east of the village of Coolbaun in North Tipperary. A high degree of habitat diversity exists for a site of this size, ranging from lakes and ponds through to dry broadleaved woodland.
Lough Corrib pNHA	000297	Description of pNHA not available, See Lough Corrib SAC site synopsis
Lough Cutra pNHA	000299	Description of pNHA not available, See Lough Cutra SAC site synopsis
Lough Fingall Complex pNHA	000606	Description of pNHA not available, See Lough Fingall Complex SAC site synopsis
Lough Ourna pNHA	000650	No description available
Loughmore Common Turlough pNHA	000438	Designated for the presence of a turlough.

Proposed Natural Heritage Area	Site Code	Reason for Designation
Moanveanlagh Bog pNHA	000374	Description of pNHA not available, See Moanveanlagh Bog SAC site synopsis
Newchapel Turlough pNHA	000653	Designated for the presence of a turlough.
Peterswell Turlough pNHA	000318	Description of pNHA not available, See Peterswell Turlough SAC site synopsis
Pollduagh Cave, Gort pNHA	000320	Designated as a Daubenton's Nursery roost.
Pollnaknockaun Wood Nature Reserve pNHA	000319	Description of pNHA not available, See Pollnaknockaun Wood Nature Reserve SAC site synopsis
River Shannon Callows pNHA	000216	Description of pNHA not available, See River Shannon Callows SAC site synopsis
Rosturra Wood pNHA	001313	Description of pNHA not available, See Rosturra Wood SAC site synopsis
Silvermine Mountains pNHA	000939	Description of pNHA not available, See Silvermine Mountains SAC site synopsis
Skoolhill pNHA	001996	Two woodlands occur here, with a mixture of native tree species such as Ash (<i>Fraxinus excelsior</i>), Hazel (<i>Corylus avellana</i>), Hawthorn (<i>Crataegus monogyna</i>) and oak (<i>Quercus spp.</i>) as well as exotics like Beech (<i>Fagus sylvatica</i>) and Sycamore (<i>Acer pseudoplatanus</i>).
Sonnagh Bog pNHA	001913	Description of pNHA not available, See Sonnagh Bog SAC
Spring Park Wetlands pNHA	000941	No description available.
Sturamus Island pNHA	001436	Supports a Common Tern breeding colony
Tarbert Bay pNHA	001386	Description of pNHA not available, See Lower River Shannon SAC site synopsis
Tory Hill pNHA	000439	Description of pNHA not available, See Tory Hill SAC Site synopsis
Willsborough Esker pNHA	000943	Species of note on site include Hazel (<i>Corylus avellana</i>), Ash (<i>Fraxinus excelsior</i>), Hawthorn (<i>Crataegus monogyna</i>), Holly (<i>Ilex aquifolium</i>), Gorse (<i>Ulex europaeus</i>), (<i>Euonymus europaeus</i>) and Yew (<i>Taxus baccata</i>).





5.6.6 Ramsar Sites

There is one wetland within the County which is designated as a Ramsar Site which is considered to be of international importance ecologically, especially with regard to wetland waterfowl. This site is included in **Table 5.6.5** and shown on Figure 5.6-5.

Table 5.6.5: Ramsar Sites within the Plan area

Ramsar Site	Site Code	Designated for the Presence of the Following ⁸
Ballyallia Lake	845	308ha including two small lakes set in heavily farmed land, with a low-lying flood plain of wet grassland and rough grazing. Site supports internationally and nationally important numbers of various species of waterbirds.

Other Ramsar sites within vicinity of the County boundary include Inner Galway Bay, Coole Lough and Garryland Wood.

Other Sites of Environmental and Ecological Importance

5.6.7 Salmonid Regulated Waters

Salmonid Waters are protected waters under S.I. No. 293/1988 European Communities (Quality of Salmonid Waters) Regulations, 1988. Clare has two salmonid protected waters within the county. This is the main channel of the River Fergus and it includes the Clooneen (Clare) which forms the upper reaches of the River Fergus. See **Figure 5.6-5** for salmonid regulated river locations.

5.6.8 Burren National Park

The Burren National Park is located in the south-eastern corner of the Burren, which is located in the northern part of County Clare and is approximately 1500ha in size. Highly significant habitats can be found in the Burren which include; Limestone Pavement, Calcareous grassland, Hazel scrub, Ash/Hazel woodland, Turloughs, Lakes, Petrifying springs, Cliffs and Fen. Mammals recorded in the Burren National Park include Irish Hare (*Lepus timidus hibernicus*) and Otter (*Lutra lutra*). The Burren and Cliffs of Moher have successfully retained its Geopark designation for a further period following a reassessment and revalidation by the UNESCO supported Global Geopark Network in September 2015. See **Figure 5.6.5** for the location of the Burren National park in Clare.

5.6.9 Statutory Nature Reserves

A nature reserve is an area of importance to wildlife, which is protected under Ministerial order. Most are owned by the State although some are owned by organisations or private landowners. There are four statutory nature reserves in the county, and these are set out in

Table 5.6.6. The extent of each Nature Reserve was also used as part of the Environmental Sensitivity map (See **Figure 5.6-5** and **Section 5.12** of the SEA ER.)

⁸ <http://irishwetlands.ie/irish-sites/>

Table 5.6.6: Statutory Nature Reserves within the County

Name	Location	Details
Ballyteigue Nature Reserve	2km east of Lisdoonvarna	6.4ha of primarily molinia meadows (wet grassland) habitat. The marsh orchid is found in abundance on the site. Hare, Snipe, Common Frog and Orange Tip Butterfly can also be found on the site.
Caher (Murphy) Nature Reserve	In the Slieve Aughty Mountains	9ha of oak wood on moist fertile soil and contains a rich ground flora.
Dromore Wood Nature Reserve	Near Ruan, 10km north of Ennis	370ha of rivers, lakes, turloughs and callows, limestone pavement, fen peat, reed and rush beds and vast areas of species rich woodland. The area comprises perfect habitat for a huge variety of flora and fauna species. Pine marten, red squirrel, a number of active badger sets, stoat, fox and hares are common in the reserve. At least eight of the nine species of Irish bats are known to inhabit the woodland including a number of bat roosts. The lakes (fed by the River Fergus) provide perfect habitat for otters, coots, grebe, moorhen, water rail and heron. Teal, wigeon, goldeneye and tufted duck, pochard and shoveler feed on flooded meadows during winter. Whooper swans, and white tailed eagles have visited during winter. Large varieties of Irish butterflies, dragonflies and damselflies.
Keelhill (Slieve Carron/Eagle's Rock) Nature Reserve	Situated in the north-east edge of the Burren plateau	A good example of karst topography containing three distinct vegetation communities i.e. woodland, scrub grassland and pavement.

5.6.10 Wildfowl Sanctuaries

Wildfowl sanctuaries are areas that have been excluded from the 'Open Season Order' so that game birds can rest and feed undisturbed. Shooting of game birds is not allowed in these sanctuaries of which there are 5 within the county. These are listed below and shown on **Figure 5.6-5**:

- Mutton Island
- Islandavanna
- Tullagher Lough
- Ballyallia Lough
- Inagh River (part of)

5.6.11 Protected Birds in Clare

Twenty SPA's are found within County Clare and are listed above in **Table 5.6.2** along with their SCI birds for which the designations are given. Clare is a very important county for protected bird species, boasting both a coastal bird populations and populations that are found primarily inland. Protected areas of note include the vast River Shannon and Fergus Estuaries SPA and the Lough Derg SPA.

The National Parks and Wildlife Service has been involved in the monitoring of hen harrier at the national scale for nearly twenty years. National breeding surveys have been undertaken on a five-year basis since the turn of the last century. The latest national survey estimated the population in the republic of Ireland to be 108 – 157 breeding pairs⁹.

Slieve Aughty Mountains SPA is found within County Clare and is the only SPA in Clare designated for Hen Harrier. The Hen Harrier Threat Response Plan was developed to avoid and eliminate threats

⁹ [https://www.npws.ie/sites/default/files/files/Hen%20Harrier%20Web%20Content%20\(2\).pdf](https://www.npws.ie/sites/default/files/files/Hen%20Harrier%20Web%20Content%20(2).pdf)

to the Hen Harrier. The NPWS began the plan in 2013. In 2017 a Position Statement was released by Birdwatch Ireland and the Irish Raptor Study Group detailing the requirements for delivering an effective Hen Harrier Threat Response Plan. The following principles were outlined by both parts and are vital to delivery of the plan;

- Applying scientific information;
- Apply the Precautionary Principle where scientific evidence is lacking;
- Provide clarity and transparency to stakeholders;
- Incentivise Hen Harrier conservation;
- Set Conservation Objectives;
- No further afforestation in the SPA network;
- Adequate protection of Hen Harrier populations outside the SPA network;
- Establish guidelines for wind energy impact assessments and post-construction monitoring and;
- Adequate protection of important non-breeding sites for Hen Harrier.

The OPW has biodiversity initiatives in place in Scattery Island off the coast of Clare. This island is a hen harrier nesting site and through the NPWS and the OPW visitors access routes have been adapted to protect these nesting sites on Scattery Island, Co. Clare¹⁰.

In 2020, the NPWS in tandem with the Golden Eagle Trust began a second phase White-Tailed Eagle reintroduction project to bolster the existing eagle population in Ireland. The original reintroduction programme (2007-2011) involved releasing 100 young white-tailed eagles in Killarney National Park and the second phase builds upon those results. The released eagles subsequently dispersed widely throughout Ireland with the first successful breeding occurring in 2012 on Lough Derg, County Clare. By July 2020, a small breeding population of eight to ten pairs had successfully fledged 31 chicks across counties Cork, Kerry, Clare, Galway and Tipperary.

The new phase of the reintroduction programme (2020-2022) involves the release of young eagles at several sites, including Lough Derg and the Lower Shannon estuary both within Clare. In early June 2020, the project began with the collection of ten chicks from nests in Norway (under licence by the Norwegian Institute for Nature Research). The juvenile White-tailed Eagles were flown into Kerry airport and were held in specially built aviaries in Munster before being released in August 2020. All of the birds were wing-tagged and satellite tagged. By early 2021, the satellite tracks showed they had spread out across Munster and northwards up the Shannon River.

The Irish Raptor Study Group (IRSG) is a voluntary organisation, formed in 1994, that specialises in the deployment of volunteer fieldworkers with highly specialised skills in the identification and survey of Raptors (Birds of Prey) and Owls. The IRSG has two primary aims, namely to (a) promote the conservation and protection of all wild breeding and migratory Raptor species and their habitats in Ireland and (b) encourage research and monitoring of all Raptor species and the publication of such work where appropriate. A key element of the Groups work is to collect and collate data to determine the abundance, distribution and population trends of Raptors. The IRSG have been involved in all national surveys of Raptor species to date (including Peregrine and Hen Harrier) and are actively pursuing an All-Ireland Raptor Monitoring Scheme. The most recent review was published in 2019 and summaries Raptor (and Owl) nest monitoring records submitted to the Irish Raptor Study Group for the 2018 breeding season¹¹. This includes a Merlin survey conducted within the Slieve Aughty Mountains SPA with one breeding pair identified.

Birdwatch Ireland have prepared a bird wind sensitivity mapping tool for wind energy developments, part funded by the EPA. This is a pre-planning tool to assist developers/planners/ecologists to understand the sensitivity of selected bird species. The tool does not create 'no-go' areas but rather

¹⁰ <https://www.eolasmagazine.ie/driving-initiative-for-biodiversity/>

¹¹ Wilson-Parr, R. & O'Brien, I. (Eds.) 2019. Irish Raptor Study Group Annual Review 2018
<http://irsg.ie/IRSGAR2018.pdf>

can be used to inform the appropriate siting of wind energy developments. It is hosted on the National Biodiversity Data Centre live maps. See **Figure 5.6-6** for Bird Sensitivity Mapping of Ireland ¹².

Birdwatch Ireland supported by Clare County Council also conducted surveys of Swifts in County Clare in the summer of 2020. Swifts are a small migratory bird that visits Ireland each year to nest. They travel from southern Africa. Swifts have adapted to nesting in cavities where found in buildings in our cities, towns, and villages. Their future is seriously threatened in Ireland due primarily to the loss of existing nesting sites, owed to renovations of older buildings without provisions for Swifts being made and their exclusion from modern buildings due to modern design and materials removing suitable access and nesting crevices typical in older structures. Finding, recording, and mapping swift nesting sites is core to the Clare Swift Survey 2020. Identifying key areas is the first step in halting the decline of swift populations.

EirGrid produced a literature review and evidence-based field study on the effects of high voltage transmission lines on birds in 2016¹³. Weekly searches over 2 months at three transmission power line sites in Ireland identified as potentially high risk for bird collisions produced estimated collision rates of 0.08 casualties per km per day (30 per km per year) at Moystown Demesne, 0.03 casualties per km per day (9 per km per year) at Ballymacegan, and 0 casualties per km per day at Clonony More.

These means are based on very small numbers of bird remains found at each site, with most visits yielding no remains, so should be treated with caution as estimates of the mean at each site are very sensitive to small variations in the numbers found. These rates are also minimal estimates, uncorrected for bias in relation to scavenger removal, observer search efficiency, or crippling (where birds which strike a power line fly out of the search area for bird remains, and may either die as a result of injuries, or recover). Estimated collision rates from field searches under 'high risk' transmission sites in Ireland in 2013 varied from 0 to 0.49 birds per km per day (0 to 179 birds per km per year). These rates have not been corrected for any potential bias and are considered to be minimum estimates. These rates were found to be similar to that of available literature throughout the world.

The thin wire at the top of powerlines is widely reported as the main cause of bird collisions. Collisions with powerlines are considered to be rare events. Most studies conclude that mortality from collisions is unlikely to affect bird populations. However, where rare or protected species occur, impacts could be significant. Measures to reduce bird collisions include careful line route assessments and the marking of lines to make them more visible to birds. Research shows positive results from marking lines, with reductions in bird deaths of 50% or more. The location for marked sections of transmission line is determined by survey and analysis of bird movements. Monitoring the effectiveness of the line marking is recommended.

The Moneypoint to Dunstown 400Kv power line was not assessed in this study. Power generated in Moneypoint Power Station Co. Clare is currently transported across the country on two high-voltage power lines to the Dunstown substation in Kildare and Woodland substation in Meath. These two 400Kv power lines pass through 14 Mid and South Clare on their way to the east of the country.

¹² https://birdwatchireland.ie/app/uploads/2019/09/BWI-Bird-Wind-Energy-devt-Sensitivity-Mapping-Guidance_document.pdf

¹³ <https://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-Evidence-Based-Environmental-Study-5-Birds.pdf>

¹⁴ <https://storymaps.arcgis.com/stories/c7ec4696b65846feb1a384b85d39dde2>

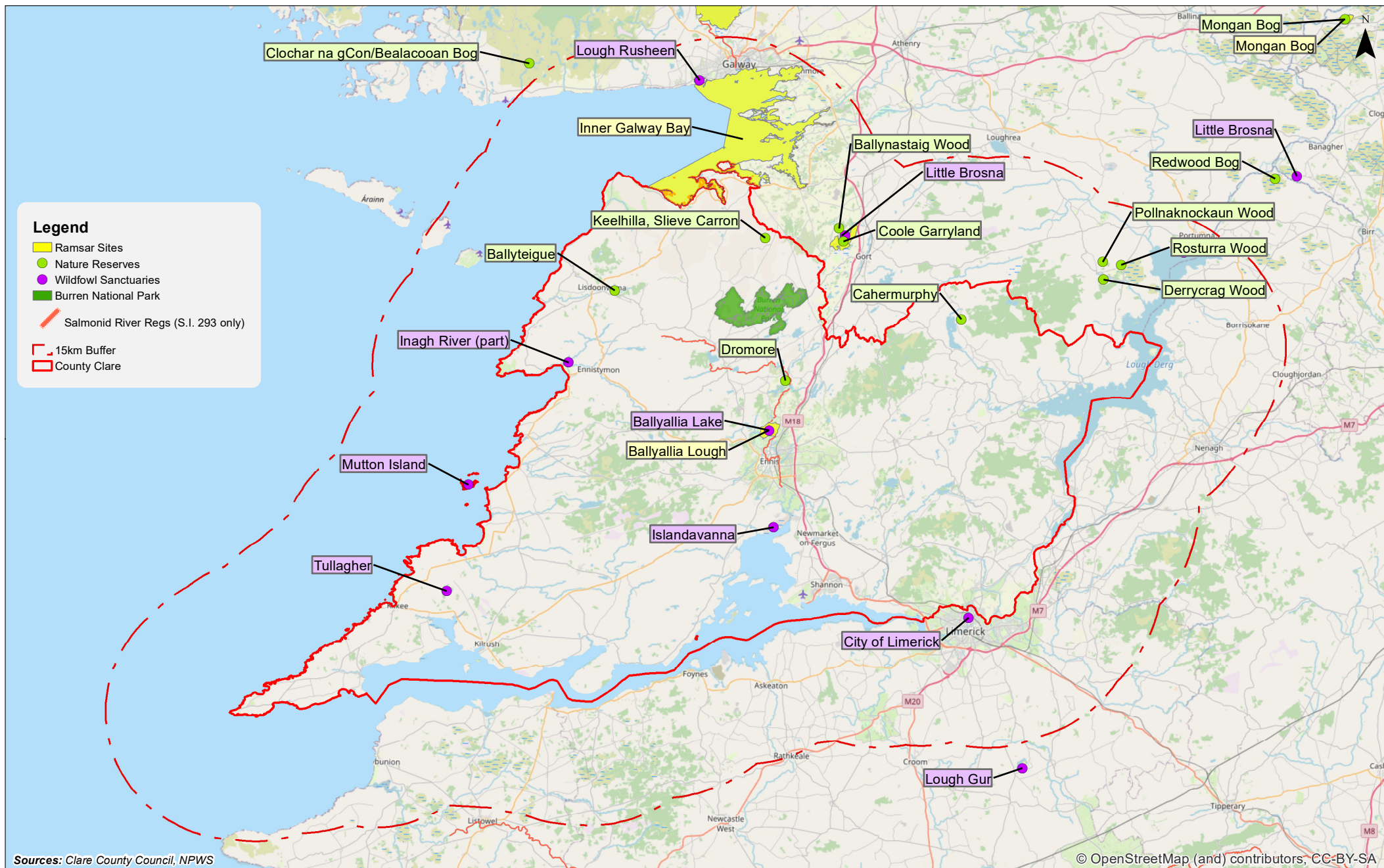


Figure 5.6-6: Bird Sensitivity Mapping

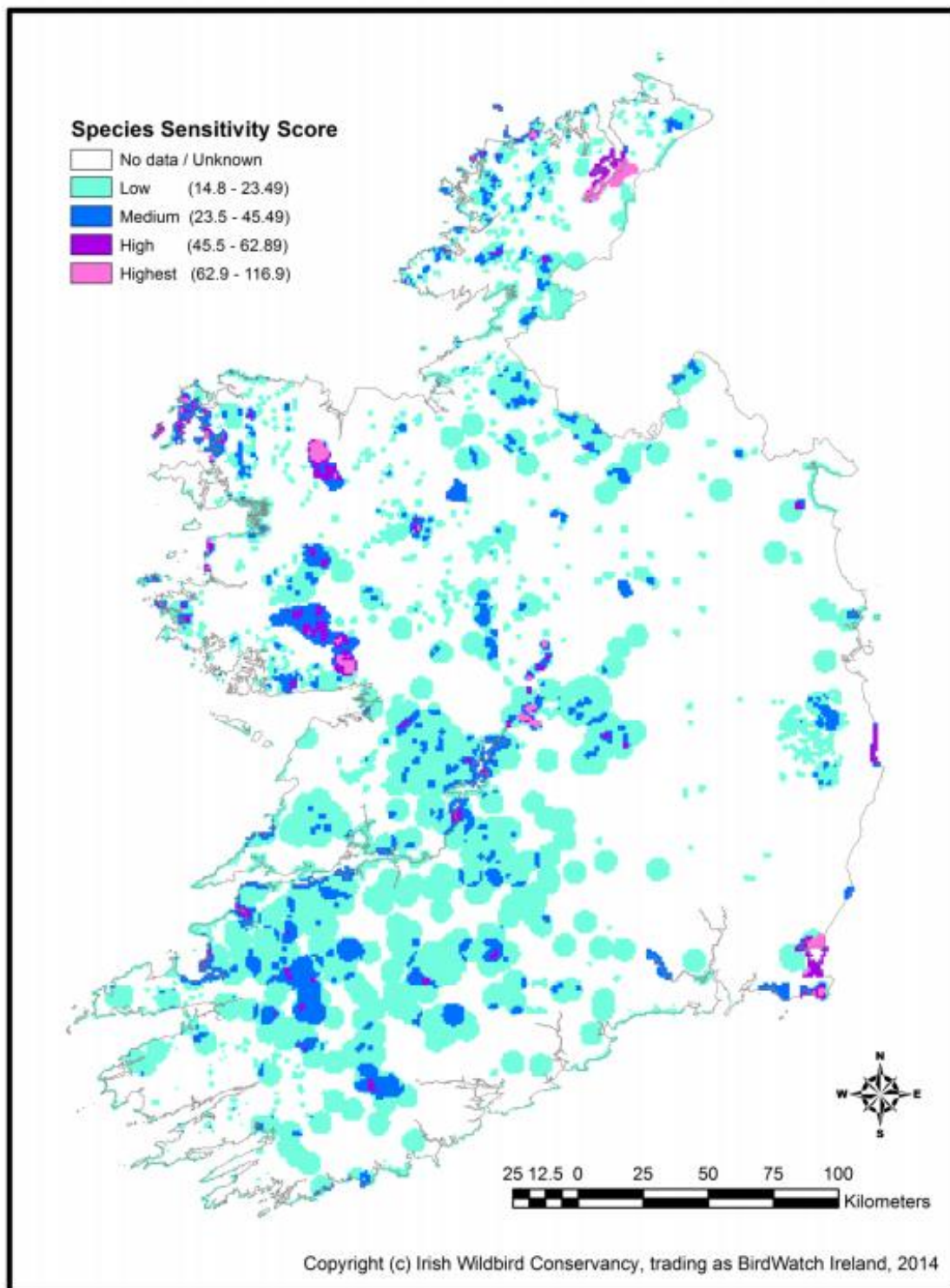


Figure 8: Composite Sensitivity Map of mainland Republic of Ireland, following mapping and assessment of 22 key species of birds in relation to the risk posed by wind energy development. Note that those areas not coloured are not necessarily without sensitive species, but do not contain species with sensitivities less than 14.8 SSS.

5.6.12 Peatlands

Peat soils cover 20.6% of the national land area. The original area of raised bogs in the State was approximately 311,000ha and the original area of blanket bogs was approximately 774,000ha. Approximately 5.7% of the landcover in the county is peatland (19600ha). The presence of these bogs habitats and their international importance is reflected in the high number of sites with natural heritage designations as shown in **Table 5.6.3** and **Table 5.6.4**. Whilst many of the bogs are protected through their designation as National Heritage Areas under the Wildlife Amendment Act, there are other areas that are not protected which lie outside of the NHA designation.

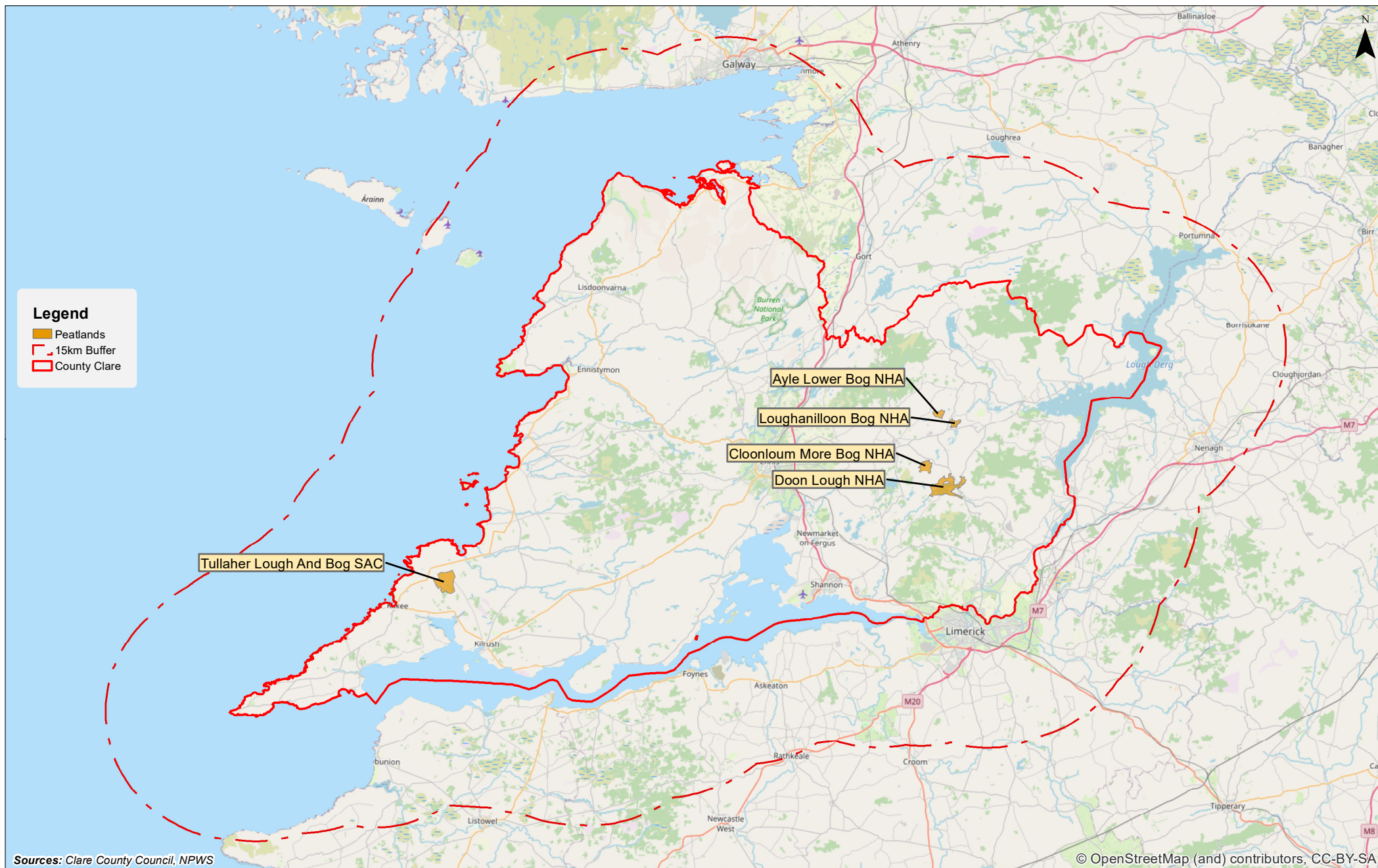
Ireland has nominated 53 sites as Raised Bog SACs under the EU Habitats Directive and therefore is required under the directive to put in place measures to protect these sites from deterioration. The aim of the National Raised Bog SAC Management Plan 2017-2022 is to provide clarity to all parties regarding how Ireland's network of raised bog SACs will be managed, conserved and restored into the future. This will be done in co-operation with landowners, turf-cutters and local communities and in keeping with legal obligations and commitments such as under the European Union (EU) Habitats Directive (Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC).

The plan sets national restoration targets for raised bog habitats that require the restoration of the national network of raised bog SACs and Natural Heritage Areas (NHAs)¹⁵. Within Clare four raised bog NHAs and one raised bog SAC have been identified:

- Tullagher Lough and Bog SAC – 002343
- Ayle Lower Bog NHA – 000993
- Loughanilloon Bog NHA – 001020
- Cloonloun More bog NHA – 002307
- Doon Lough Bog NHA – 000337

These 5 raised bogs can be seen in **Figure 5.6-7**.

¹⁵ [https://www.npws.ie/sites/default/files/files/FOR%20UPLOAD%20Plan\(WEB_English\)_05_02_18%20\(1\).pdf](https://www.npws.ie/sites/default/files/files/FOR%20UPLOAD%20Plan(WEB_English)_05_02_18%20(1).pdf)



5.6.13 Wetlands

A wetland is an area that is saturated by water and this saturation has allowed specially adapted plants and animals to establish. Clare is home to many different wetland types due to the wet climate, topography, geology, hydrology and soil types. Many of these are regarded as being internationally important.

Wetlands are effectively the border between the open water and dry land. Reeds, sedges, water forget-me-not, marsh marigold and purple loosestrife provide cover for ducks and wading birds. Other wetlands, such as bogs, heath and fens, occur where the water table is close to the surface, or where the bedrock is impenetrable.

Wetlands, such as fens and bogs, only retain carbon if they are moist. Therefore, when a bog or fen is drained or infilled, they become major carbon sources, releasing huge quantities of carbon dioxide into the atmosphere as the peat decays and oxidises. In addition, the changing conditions result in the loss of water dependant species. Changes in water quality as a result of pollution (from surface run-off, WWTPs, etc.) also significantly impact wetlands.

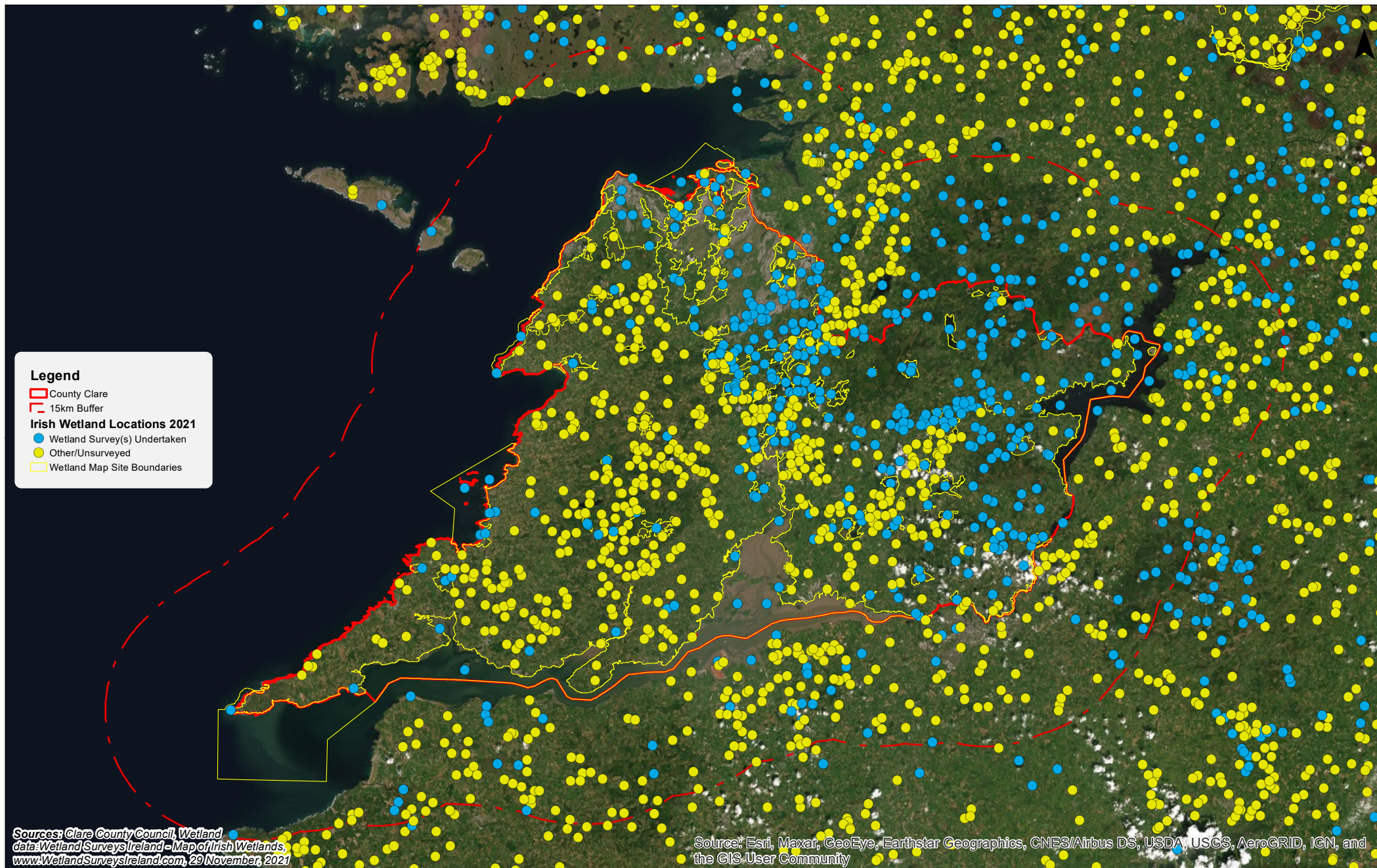
The value of wetlands include their function in improving water quality, for floodwater storage whereby they can slow down the force of flood and storm waters as they travel downstream; habitat for wildlife; support biodiversity; provide valuable open space and create recreational opportunities; are vital for preventing further climate change by acting as carbon storage and are part of cultural heritage¹⁶.

A revised map of wetlands in Ireland was produced by Wetlands Survey Ireland in 2016. The most recent wetland site additions to the Clare wetland map are “new or potential” wetland sites located through an aerial photographic analysis combined with sub soils data, together with habitat mapping studies undertaken in east Clare between 2008 and 2010. Prior to this most recent review, 389 wetland sites had been identified within the county which were designated under SACs, SPAs, NHAs and pNHAs. This mapping project has located an additional 361 wetland sites throughout the county, bringing the total number to sites identified in Clare to 750¹⁷. The majority of the “new” potential sites identified have limited associated information on the wetland habitats that are likely to occur on the sites. Future county wetland surveys are required to address this information deficit. **Figure 5.6-8** illustrates the wetlands within County Clare.

Turloughs are karst wetland ecosystems that are virtually unique to Ireland. They are usually flooded in winter and dry in summer. They contain many specialist invertebrates and provide important winter-feeding grounds for several species of wetland and wading birds. Hydrology is the key driver of turlough ecology with flood duration and groundwater contribution important factors, Grazing is also integral to the ecology and it's important that appropriate grazing levels are maintained. Within Clare there a total of six SACs in which Turloughs are a Qualifying Interest and they are considered a priority habitat.

¹⁶ The County Clare Wetlands Survey 2008

¹⁷ <http://www.wetlandssurveyireland.com/news/revised-county-clare-wetlan.html>



5.6.14 The Shannon Estuary

The Shannon Estuary is one of the most important sites in Ireland for wintering and migrating waterbirds, supporting 10 bird species in numbers of international importance and a further 13 bird species occurring in numbers of national importance (Crowe, 2005). The entire Estuary is designated a Special Area of Conservation (SAC). The Estuary as far west as Doonaha is also designated as a Special Protection Area (SPA). In 2011, NPWS proposed an extension to the SPA bringing the extent of the designation from Foynes further west to the outer part of the estuary. The designation process will be completed once the S.I. has been signed by the Minister. This does not affect the protection afforded to the site from the date of the advertisement which was June 2011.

The Shannon Estuary is also one of the most important habitats in Ireland, if not Europe, for bottlenose dolphins *Tursiops truncatus*. It is home to Ireland's only known resident populations of bottlenose dolphins and is designated as a Special Area of Conservation (SAC) for this species. All cetaceans are listed under Annex IV (including those in Annex II) of Council Directive 92/43/EEC (the Habitats Directive). Accordingly, under Article 12 of that Directive, it is an offence to deliberately capture, disturb or kill a cetacean or take actions that result in deterioration or destruction of their breeding sites or resting places. The Shannon Estuary was assessed for Bottle nosed Dolphins in 2012 by the Shannon Dolphin and Wildlife Foundation¹⁸.

The assessment mapped habitat suitability for BN Dolphins and concluded that the majority of the Shannon Estuary had intermediate habitat priority for Bottle Nosed dolphin exemplifying its importance for these cetaceans. The entire Shannon Estuary is also important for a number of migratory fish species some of which are protected under EU directives and have up and down stream migrations at various times throughout the year depending on the particular fish life stage, shown in **Table 5.6.7**. Fishing activity is particularly relevant in the context of dredging and development works and forms a crucial part of the dumping at sea permit application process through the EPA.

Table 5.6.7: Generalised Timing of Life Stages of Relevant Migratory Fish Species using the Shannon Estuary (Source; IFI)

Fish Species	EU Status	Life Stages	Estuary Transit
Atlantic salmon	Habitats – Annex II	Adult upstream migration	All times of year; “Spring” fish; grilse run in June-July
		Smolt downstream run	March - June
Sea Lamprey	Habitats – Annex II	Upstream Adult spawning migration	April - July
		Seaward migration of young adults	Autumn - Winter
River Lamprey	Habitats – Annex II	Upstream Adult spawning migration	Autumn - Winter
		Seaward migration of young adults	Autumn - Winter
Smelt	None	Adult upstream spawning migration	February – April
		Larval – young adult downstream migration	Post – spawning gradual downstream dispersal – April - August
Eel	EU Eel Action Plan	Upstream migration of elvers	
		Downstream of adult fish	Autumn

¹⁸ <http://www.shannonestuariesifp.ie/wp-content/uploads/2016/03/Identification-and-rating-of-important-areas-for-Bottlenose-Dolphins.pdf>

5.6.15 Native Woodlands

There are 112 native woodlands within the County¹⁹. Ancient woodlands are considered to be those which are established and had continuous cover before afforestation and planting became common practice in Ireland. Ancient woodlands are vulnerable to impacts from clearing and sensitive due to their age and habitat types associated with them. A provisional inventory of ancient woodlands undertaken by the NPWS shows that there are 150 within the County with the area of native woodlands within County Clare estimated to be 9660 ha.

Native woodland in Ireland suffers from what may be deemed internal and external threats. The main contemporary internal, or ecological, threats are from inappropriate grazing and from invasive alien species, although in the past underplanting with conifer species was a widespread practice. Grazing pressure in woodlands comes from domestic stock, chiefly cattle and sheep, feral populations of goats and wild deer. As deer lack any natural predators in Ireland, control of populations, typically through fencing or culling, is a major management issue. Heavy grazing pressure can reduce field layer diversity and inhibit regeneration of tree species through damage or removal of seedlings and saplings, eventually affecting stand structure and species composition. Mapped Native Woodlands in County Clare can be seen in **Figure 5.6-9**.

¹⁹ <https://www.npws.ie/sites/default/files/general/nsnw-vol-1.pdf>



SEA AA and RES of Clare Co Dev Plan

Projection: IRENET95 Irish Transverse Mercator

Scale: 1:600,000 (A4)

Date: 29/11/2021

Drawn: NR

Checked: IP

Approved: AG

Status: Final

Rev: F01

File Ref: CP20027Arc0019F01



Clare County Council

Figure 5.6-9 Native Woodlands



5.6.16 Habitats and Land use within County Clare

Clare's lengthy coastline means there is a wide extent of important marine and coastal habitat associated with the county. These include rocky shores, reefs, dune habitats, estuaries, sea cliffs and intertidal mudflats. Protected species that are common within these habitats include Bottle nosed dolphin, harbour porpoise and common seal. Many of Clare's marine and coastal habitats are part of European designations (SAC, SPA and MPA).

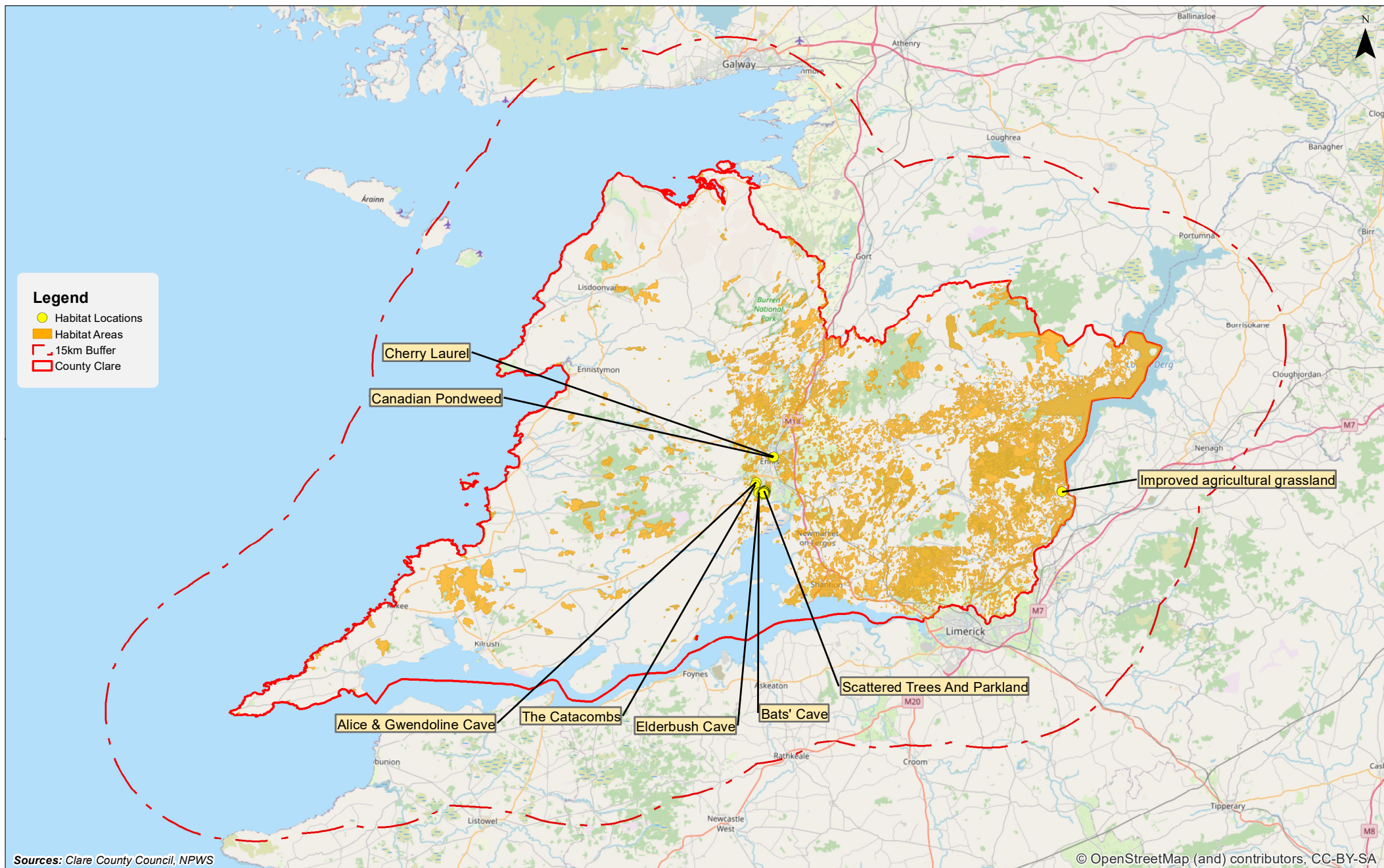
Wetlands are common throughout the county with many turloughs, fens and lakes found within the Burren. Peatlands are found throughout Clare with one raised bog designated as an SAC and 4 other raised bogs designated as pNHA. Grassland habitats within Clare include wet grasslands and dry calcareous grasslands. The Burren provides habitat for bat species through cave systems and is also home to incredibly diverse plant species. Woodland habitat within Clare is sparse with patches of Ancient woodland. More common woodlands in Clare include oak-ash-hazel woodlands and some wet alder woodlands. Common species within these habitats include red squirrel, pine marten, and hedgehog with multiple bat species using these woodlands to forage and commute.

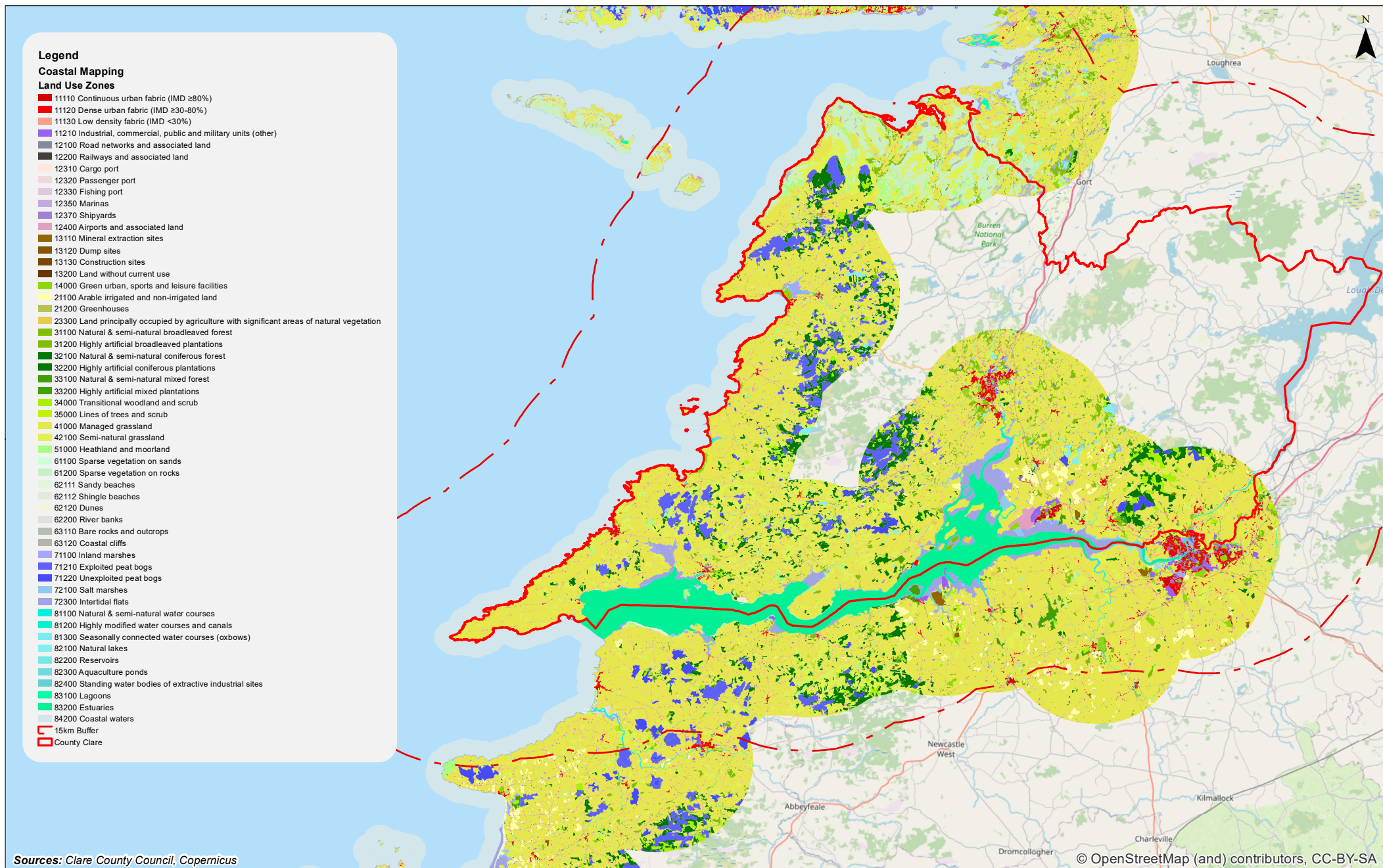
Hedgerow habitat throughout the county also provides habitat for nesting bird species. Clare has a large network of rivers and due to the plentiful limestone within the county, underground aquifers. Petrifying springs are an example of habitat found within Clare which rely on lime rich water sources where tufa is actively deposited.

Clare County Council undertook habitat mapping of East Clare (2008), South East Clare (2008), Mid and North Clare in (2009), Mid Clare (2010) and Mid East Clare (2011), see **Figure 5.6-10** for current habitat mapping of County Clare from these studies.

Copernicus is the European Union's Earth observation programme that can provide data to map areas with the EU. The European Commission manages the programme. It is implemented in partnership with the Member States, the European Space Agency (ESA), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), the European Centre for Medium-Range Weather Forecasts (ECMWF), EU Agencies and Mercator Océan.

A Coastal Zones dataset was made available in 2018 detailing the Coastal zones Land Use of European Union States, see **Figure 5.6-11** for Coastal Land Use in County Clare.





5.6.17 Coastal and Marine Protected Sites

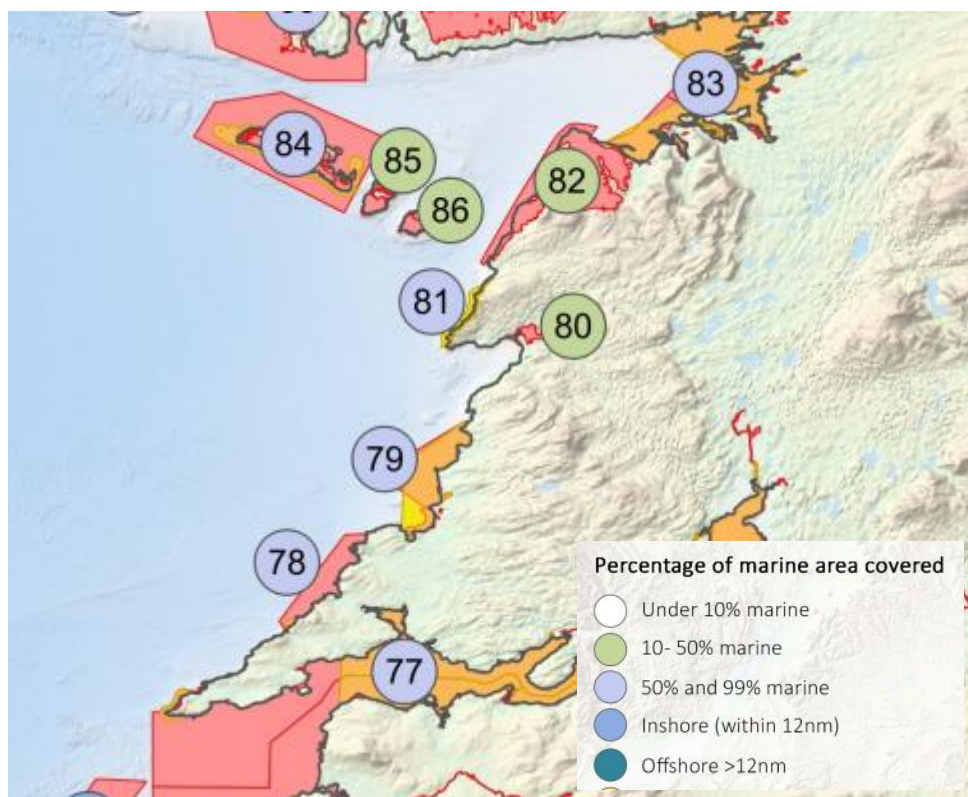
The NPWS has also conducted a number of coastal inventories documenting different coastal and shoreline features. There are 1,149 salt marshes around the Clare coastline. As part of the coastline monitoring project inventory, there are 228 other coastline habitat (including those on Annex 1) are recorded for County Clare. Additionally, there are 8 coastal lagoons in County Clare.

Ireland, along with many other countries, has committed to designate 10% of its seas as MPAs by 2020 and 30% by 2030²⁰. Marine Protected Areas can include SAC's and SPA's which are partially or wholly marine. An MPA can contain several European sites dependent on the size allocated to the MPA i.e. River Shannon MPA contains The Lower River Shannon SAC, River Shannon and River Fergus Estuaries SPA and Loop Head SPA.

MPA's associated with County Clare are shown below in **Figure 5.6-12** and include:

- The River Shannon MPA Complex (MPA Code: 77),
- Kilkee Reefs with Illaunonearaun (MPA Code: 78),
- Carrowmore Point to Spanish Point (MPA Code: 79),
- Inagh River Estuary (MPA Code: 80),
- Cliffs of Moher (MPA Code: 81),
- Black Head-Poulsallagh Complex (MPA Code: 82), and
- Galway Bay (MPA Code: 83).

Figure 5.6-12: Marine Protected Areas



²⁰ <https://coastwatch.org/europe/mpa-project/>

5.6.18 Protected Habitats and species outside of Designated Sites

Habitat mapping, bat surveys and tree surveys have helped to identify habitats and species which occur outside of designated sites, but which are protected under European and National legislation. These include lesser horseshoe bat roosts, cladium fens, turloughs and other wetlands, oak-ash-hazel woodland, and riparian woodland, among others.

The freshwater pearl mussel is an extremely sensitive species which is currently on in IUCN Red List of Threatened Species and is rated as 'critically endangered' throughout the island of Ireland. Populations of the freshwater pearl mussel can be damaged in a numbers of ways including the removal of river boulders and gravels, or through works such as building bridges, weirs or bank reinforcements within the mussel habitats.

Within County Clare there is one freshwater pearl mussel SAC population for which the river catchment is protected. This is the Cloon River system which is located on the north shore of the Shannon Estuary feeding into the estuary at its downstream end as outlined in Table 5.6.1 and Table 5.6.7: Generalised Timing of Life Stages of Relevant Migratory Fish Species using the Shannon Estuary (Source; IFI) Table 5.6.7 and as shown in **Figure 5.6-13**.

The freshwater pearl mussel is acknowledged to be one of the most demanding species of high water quality and high river bed quality in the world. Due to the extreme sensitivity of the FPM, all land use activities in the catchment must be in keeping with the needs of a thriving mussel population, as just one damaging activity can destroy the good work in the rest of the catchment.

Whilst Ireland and Northern Ireland support a significant proportion of the FPM populations remaining in Europe, these populations have been in dramatic decline in recent years, with an estimated loss of over a million mussels between 2007 and 2013 (DAHG, 2013). The species is on the IUCN Red List of Threatened Species and throughout the island of Ireland it is rated as critically endangered.

Populations of the freshwater pearl mussel can be damaged in a number of ways. Direct damage to the mussel and its habitat can occur through removal of river boulders and gravels, or through building bridges, weirs or bank reinforcements, excavation of materials which are extremely sensitive to the freshwater pearl mussel and its habitat such as peat.

Actions in areas outside the immediate habitat of the mussel may also be damaging. This damage may result from a range of activities but occurs in four main ways.

- *Changes in River Flow:* Activities such as land drainage, major land use changes, water abstraction, physical changes to the river and its tributaries by dredging or straightening can *all* affect the quantity of water in the river, and the speed and direction of river flow.
- *Addition of Chemicals and Nutrients:* A range of substances cause harm to mussels when they enter the river. Industrial pollutants, nutrients (phosphorus and nitrogen which may come from forestry, agriculture, agri-based industries, waste management facilities and sewage inputs), and pesticides (particularly sheep dip) are of serious concern in FPM catchments.
- *Inputs of Sediment:* Land drainage, construction works, tillage and animal poaching are among the many activities that can result in the movement of fine sediment from the land to water. Over time this eroded sediment makes its way through ditches and streams into the river and onto pearl mussel populations.
- *Biotic factors:* Where any of the issues above negatively affect the salmonid host of the FPM, damage to mussel populations will also result due to failure of FPM larvae to find host fish. Any reduction in numbers and distribution extent (range) of FPM results in damage to the resilience of FPM through genetic loss.

There has been a considerable decline in species distribution and numbers throughout the island of Ireland with all designated populations currently at unfavourable conservation status.

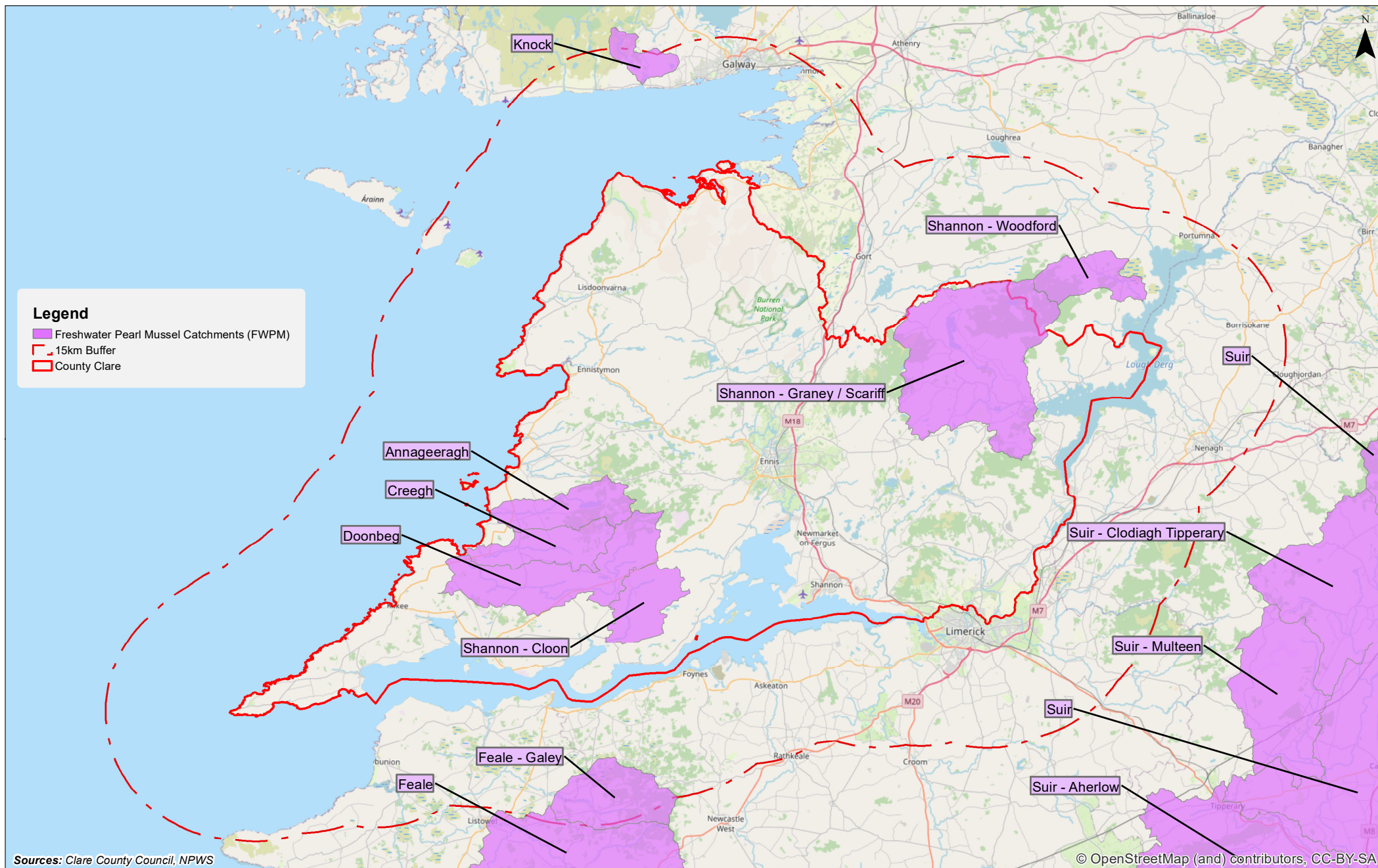
In Ireland, regulations have been introduced (The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009, S.I. No. 296 of 2009) which set objectives for FPM catchments. A requirement of these regulations is the production of sub-basin management plans for each of the 27 designated populations of FPM. Draft sub-basin plans have been prepared and are available for download at www.wfdireland.ie. The FPM sub-basin plans identify critical local pressures and impacts on the freshwater pearl mussel and provide possible measures for restoration

to favourable conservation status. The Cloon is one of these 27 populations which is currently at unfavourable conservation status.

In addition, Clare contains three other catchments which are identified as freshwater pearl mussel Sensitive Areas by National Parks and Wildlife Service this are as follows;

- Doonbeg
- Shannon – Graney/Scariff
- Shannon – Woodford

These margaritifera sensitive areas contain catchments of other extant populations or catchments with previous records. The potential effects of any plans, developments or activities on the populations, including the potential to cause 'environmental damage' as per the Environmental Liability Directive and Regulations, must be determined through SEA, EIA or other ecological assessment. The NPWS holds some detailed information on the distribution and abundance of freshwater pearl mussels in a small number of these catchments. The location and extent of these sensitive areas is shown in **Figure 5.6-13**.



5.6.19 Rare and Protected Species

The NPWS and NBDC were consulted for Rare and Protected Species within Clare county. 75% of the plants found in Ireland are represented in the flora of the Burren. Some of the rarer plants are protected under European Legislation, more under the 1999 Flora Protection Order. Mapped Bryophytes listed on the Flora Protection Order within Clare include the Endangered *Didymodon acutus*²¹, and the Least Concern *Petalophyllum ralfsii*²² both found in Fanore, the Endangered *Leptodon smithii* found at a site in Cathair Chomain²³ and the Critically endangered *Encalypta raptocarpa* found in Scarriff²⁴. Some of the rarer plants and animals are kept on internal databases within the NPWS and NBDC databases i.e. Badger sett locations, Lesser horseshoe bat roosts and rare plant locations. This is to protect their location and avoid disturbance from humans.

5.6.20 Green Infrastructure

While green infrastructure promotes the amenity and quality of life value of nature within urban settings and is not solely for the benefit of biodiversity, it is noted that it can contribute significantly to the retention and enhancement of ecological connectivity.

Green Infrastructure is defined as ‘an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations’ (Comhar, 2010). Such spaces include woodlands, coastlines, flood plains, hedgerows, fields, gardens, turloughs, lakes, city parks and street trees, and the benefits to humans they provide include water purification, flood control, carbon capture, food production and recreation.

Incorporation of green infrastructure in spatial planning and sectoral decision making helps to prevent biodiversity loss and fragmentation of ecosystems, thus restoring, maintaining and enhancing ecosystems and their services. It will improve resilience and adaptation to climate change and enable greater connectivity between ecosystems in protected areas and the wider countryside. The European Commission produced a strategy on green infrastructure in 2012. Due to its obligations under the European Landscape Convention, Ireland has prepared a National Landscape Strategy for Ireland (2015-2025) which will also have significant implications for biodiversity.

There are many inter-relationships between green-infrastructure and other environmental parameters, for instance, its integration with human health through sport and recreation opportunities as well as increasing accessibility to amenity and recreation areas and promoting social inclusion; natural heritage and cultural heritage (e.g. West Clare Railway). Clare is rich in biodiversity and developing “green infrastructure” should be considered integral to RE projects proposed within the RES.

5.6.21 Riparian Zones

The riparian zone is an integral part of any watercourse system serving ecological as well as practical functions, for example, the vegetation provides bank stability during flood conditions and filters pollutants out of surface water before it reaches a river or lake. A riparian buffer zone is a strip of vegetated land running parallel to the river which acts as a buffer against negative human development activity, which must be sufficiently wide to protect the river. It must be large enough to protect the ecological integrity of the river and the riparian zone but can incorporate amenity uses provided it is done sensitively with minimal impact on the water and riparian environment.

The county has a network of rivers and streams as shown on **Figure 5.10-2** together with their Water Framework Directive status, many of which are designated SAC and/or SPA or flow into such designated rivers and lakes and are an intrinsic part of green infrastructure.

²¹ https://www.npws.ie/sites/default/files/fpo/taxon/Didymodon_acutus_03_Fanore.pdf

²² https://www.npws.ie/sites/default/files/fpo/taxon/Petalophyllum_ralfsii_06_Fanore.pdf

²³ https://www.npws.ie/sites/default/files/fpo/taxon/Leptodon_smithii_03_Cathair_Chomain.pdf

²⁴ https://www.npws.ie/sites/default/files/fpo/taxon/Encalypta_raptocarpa_01_Scarriff.pdf

5.6.22 Protected Species within Clare

Within the Plan area Annex II species present include Atlantic Salmon, Otter, Sea, River and Brook Lamprey, freshwater pearl mussel and nine out of ten species of bats in Ireland, including the Annex IV species the Lesser Horseshoe Bat and the Annex II Brown Long-Eared Bat.

Table 5.6.8 sets out the characteristics of the protected species within Clare, the threats relevant to them and their most recent Conservation status as per the Status of EU Protected Habitats and Species in Ireland 2019.

Table 5.6.8: Protected Species within the County

Species	Characteristics and Habitat ²⁵	Threats and Conservation Status ²⁵
Brown long-eared bat	This is quite a common bat Annex IV species (Code 1326). It can be seen around old churches. Common habitats are woodland for feeding and attics in buildings for roosting, in tree holes, farm buildings and bat boxes. They feed on a wide range of insects and forage in broad-leaved woodlands, along tree-lines, in scrub, conifer plantations, mature gardens, parklands and orchards.	Conservation status is favourable
Common Pipistrelle	This bat is an Annex IV species (Code 1309). It is very general in its habitat preference, foraging in woodland, riparian habitats and parkland, along linear features in farmland, and in towns and cities	Conservation status is Favourable and increasing
Daubenton's Bat	This bat is an Annex IV species (Code 1314). It forages over water and is particularly associated with slow-moving rivers and with lakes. The majority of roosts known for this species are in masonry bridges and old stone buildings such as castles and mills. Records are numerous around Ennis and its environs	Conservation status is Favourable and increasing
Leisler's Bat	This bat is an Annex IV species (Code 1331). Of all the Irish bat species Leisler's has the most specific maternity roosting habitat requirements. They select sites with adjacent woodland and freshwater and avoid areas of arable land and coniferous woodland. Leisler's bat is widespread across Ireland, but monitoring indicates it is more abundant in the east and south of the country.	Two threats/pressures have been identified and need to be investigated further: wind energy, and the impact on roosts associated with deliberate/accidental exclusion from houses. Conservation status is Favourable and increasing.
Lesser Horseshoe Bat	This bat is an Annex II and IV species (Code 1303) and is common in Ennis and across the county due to the presence of caves and large houses with suitable attics, have internationally important populations as declining in the rest of Europe. They roost and hibernate in caves and under old bridges, breed in buildings and feed along hedgerows. Forages in deciduous woodland and riparian vegetation. The species is known to rely on linear landscape features to commute from roosts to feeding sites.	Very sensitive to disturbance. Loss of suitable summer and winter roosting sites due to the deterioration/renovation of derelict buildings, loss of commuting routes linking roosts to foraging sites and loss of suitable foraging sites are the major threats to this species. The overall conservation status of this species is assessed as inadequate and declining.

²⁵ Sourced from the Status of EU Protected Habitats and Species in Ireland 2019
https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol1_Summary_Article17.pdf

Species	Characteristics and Habitat ²⁵	Threats and Conservation Status ²⁵
Natterer's Bat	This bat is an Annex IV species (Code 1322). Summer roosts are normally in old stone buildings or masonry bridges. Usually only small numbers of bats are present, often hidden in narrow spaces where they are difficult to locate. Woodland habitats, river corridors and pastures appear to be favoured for foraging. Very few records exist within Clare.	Building renovation and loss of foraging habitat are potential threats for this species but are not considered to be significant. The Overall Status has been assessed as Favourable
Soprano Pipistrelle	This bat is an Annex IV species (Code 5009). Summer roosts are usually in buildings, including modern suburban houses, old, abandoned mansions, churches, amenity buildings and farm sheds. Bat boxes are also used. Soprano pipistrelles normally roost in very confined spaces, such as behind window sashes, under tiles and weather-boards, behind fascia and soffits, and within the cavities of flat roofs. Records are found throughout Clare with clusters found in Ennis, Shannon and Scarrieff.	There is no indication of any significant pressures impacting on the species, and numbers appear to be increasing. Conservation Status is assessed as Favourable and improving
Whiskered Bat	This bat is an Annex IV species (Code 1330). Summer roosts are normally in old stone buildings. Typically, only small numbers of bats are present, often between rafters and eaves and in other narrow spaces where they are difficult to locate. Very limited records exist within County Clare but the Bat is present	Building renovation and loss of foraging habitat are potential threats for this species but are not considered to be significant. Conservation Status is assessed as Favourable.
Atlantic Salmon	The Atlantic salmon (Annex II and IV) breeds in freshwater but spends much of its life at sea. The salmon population in Ireland has declined by 75% in recent decades and only 43 out of 148 Irish rivers in which they still occur have healthy populations.	There are numerous factors which impact negatively on salmon, the most important of which are reduced marine survival (probably as a result of climate change), poor river water quality resulting from factors such as inadequate sewage treatment, agricultural enrichment, acidification, erosion and siltation), forestry related pressures and over fishing. Current estimate is less than 10% of wild smolts that go to sea from Irish rivers are surviving. Also concerns relating to mortality at sea from such things as diseases, parasites and marine pollution. Overall conservation status is inadequate.
Otter	The otter (Annex II and IV) is widespread in Irish freshwater and coastal habitats. Main prey include sticklebacks, salmonids, frogs, crayfish and eels.	Some localised reduction in otter habitat quality due mainly to water pollution and clearance of riparian vegetation this has been balanced by reduced occurrence of severe water pollution episodes and reduced river corridor disturbance. Conservation status is favourable
Sea Lamprey	Sea Lamprey (Annex II) spend their adult life in marine and estuarine waters and migrate up rivers to spawn in areas of clean gravels, after which they die. The young larvae settle in sediment in still water where they burrow and act as filter feeders until transforming into adult fish. They can grow up to 1m in length and widely distributed around the coast.	On some rivers weirs block upstream migration which limits the species to the lower stretches and restricting access to spawning beds. Channel maintenance is a concern, removing silt deposits and gravel shoals used by lampreys. Conservation status is assessed as bad.

Species	Characteristics and Habitat ²⁵	Threats and Conservation Status ²⁵
River and Brook Lamprey	The river lamprey (Annex II, IV) grow to 30cm and has similar life to the sea lamprey. The brook lamprey (Annex II) is the smallest of the lampreys native to Ireland and the only one which is non-parasitic and spends its life in fresh water. Both are very similar genetically and cannot be distinguished visually. Have been historically recorded along the River Shannon and its tributaries	The inability to distinguish between river lamprey and brook lamprey larvae, and the challenges associated with sampling for adult river lamprey, means that an evaluation of their actual range and population size cannot be undertaken. The Overall Status for river lamprey is therefore assessed as Unknown
Freshwater Pearl Mussel	The sediment and nutrients that enter mussel rivers come from a wide variety of sources (e.g. urban wastewater, development activities, farming and forestry), often well upstream of the location of the mussels. The species can also suffer direct impacts from in-stream works such as channelization, bridge-construction and recreational fishery structures. Ensuring the long-term future of the freshwater pearl mussel requires significant, integrated catchment management to prevent direct impacts and to reduce losses of sediment and nutrients from all indirect sources.	The Overall Status is assessed as Bad and declining.
Freshwater White-Clawed Crayfish	Records for White Clawed Crayfish in Clare are sparse likely due to the geology of County Clare (Acidic limestone is not preferred by crayfish). Records have been found within the eastern side of Clare with records in the Ratty River, Hollymount River and the Blackwater (Clare) river.	White-clawed crayfish faces threats from non-indigenous crayfish species and Crayfish Plague which is a water-borne disease specific to freshwater crayfish caused by the oomycete <i>Aphanomyces astaci</i> . Non-indigenous crayfish species impact the White-clawed Crayfish through direct predation and competition but also act as carriers of Crayfish Plague. The Conservation Status is Bad with a deteriorating trend. No plague was recorded in any Clare catchments during the most recent White Clawed Crayfish catchment survey in 2019 ²⁶

The Lesser Horseshoe Bat (*Rhinolophus hipposideros*) is Ireland's only Q.I bat species and is localized to the west of Ireland with a huge abundance of the species found in Clare. It is a Q.I of sixteen SAC's within Clare. The NPWS holds a dataset of Lesser Horseshoe bats from known roost locations in 1km grid squares. These records were collected by NPWS rangers and staff, Vincent Wildlife Trust, independent ecologists and bat workers. Data is presented in 1km grid squares to preserve sensitive locations information²⁷. See a map of this data in **Figure 5.6-14**.

Bat Conservation Ireland holds bat record maps for all counties within the Republic of Ireland. These include all bat species mentioned in **Table 5.6.8** except the Lesser Horseshoe. The location of this species is protected and considered sensitive information. The records for all other species found within Clare are shown in **Figure 5.6.15** to **Figure 5.6.21**. Specific Lesser Horseshoe Bat monitoring is carried out by NPWS and the Vincent Wildlife Trust. Count data is collected and analysed by Bat Conservation Ireland. The Vincent Wildlife Trust manages two Lesser Horseshoe Bat reserves in Co.

²⁶ <https://www.biodiversityireland.ie/wordpress/wp-content/uploads/Crayfish-plague-map-20190820.pdf>

²⁷ <https://data.gov.ie/dataset/lesser-horseshoe-bat-database-records>

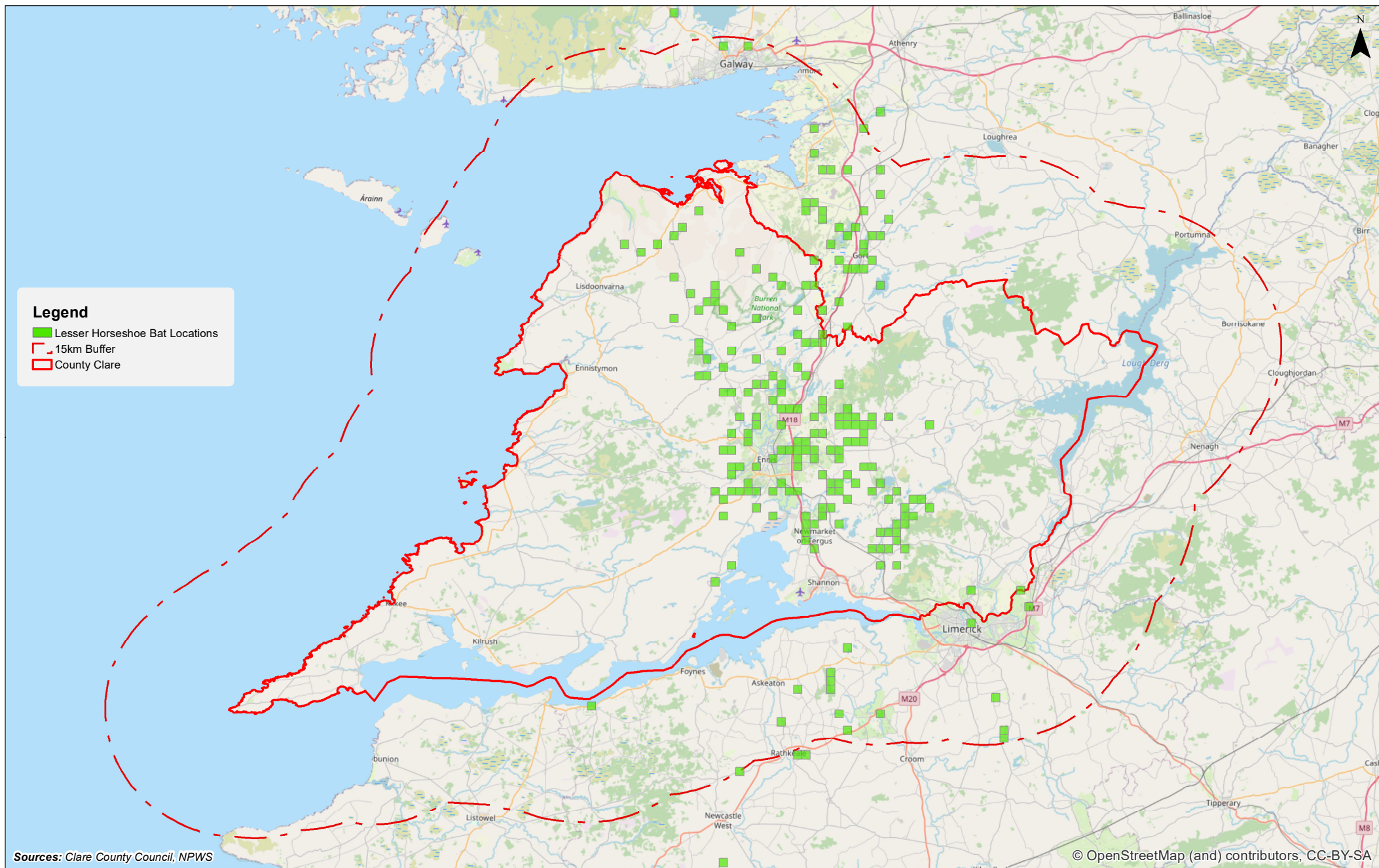
Clare; Lisduff Barn and Rylane Cottage a third reserve, Fiddaun Cottage straddles the Co. Clare boundary.

Otter (*Lutra lutra*), is a common protected species found throughout Clare county. Otters are found along rivers and streams which are plentiful in Clare and are a Q.I of five European sites within Clare.

The River Fergus and Clooneen (Clare) river are both salmonid protected waters under Salmonid Regulations (S.I. 293 / 1988). They are important waters for protected salmonids species. Sections of the River Fergus are part of the Lower River Shannon SAC and as such are designated for Atlantic salmon (*Salmo salar*), River Lamprey (*Lampetra fluviatilis*), Brook Lamprey (*Lampetra planeri*) and Sea Lamprey (*Petromyzon marinus*). Common Bottlenose Dolphin (*Tursiops truncatus*) is an Annex found within the Lower River Shannon SAC.

The River Shannon And River Fergus Estuaries SPA holds over 50,000 wintering waterbirds and is designated for twenty-one SCI bird species. It is of National and European importance as is evident by its designation as an SPA. The Cloon river is a designated Freshwater Pearl Mussel catchment with an active population of FWPM and is part of the Lower River Shannon SAC.

Nationally designated species including Badger (*Meles meles*), Common Frog (*Rana temporaria*), Irish Hare (*Lepus timidus hibernicus*) and Pine Marten (*Martes martes*) are common throughout the county.



SEA AA and RES of Clare Co Dev Plan

Projection: IRENET95 Irish Transverse Mercator

Scale: 1:600,000 (A4)

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Figure 5.6-14 Bat Roost Locations within County Clare

Figure 5.6-15: Brown Long-Eared Bat Records within County Clare

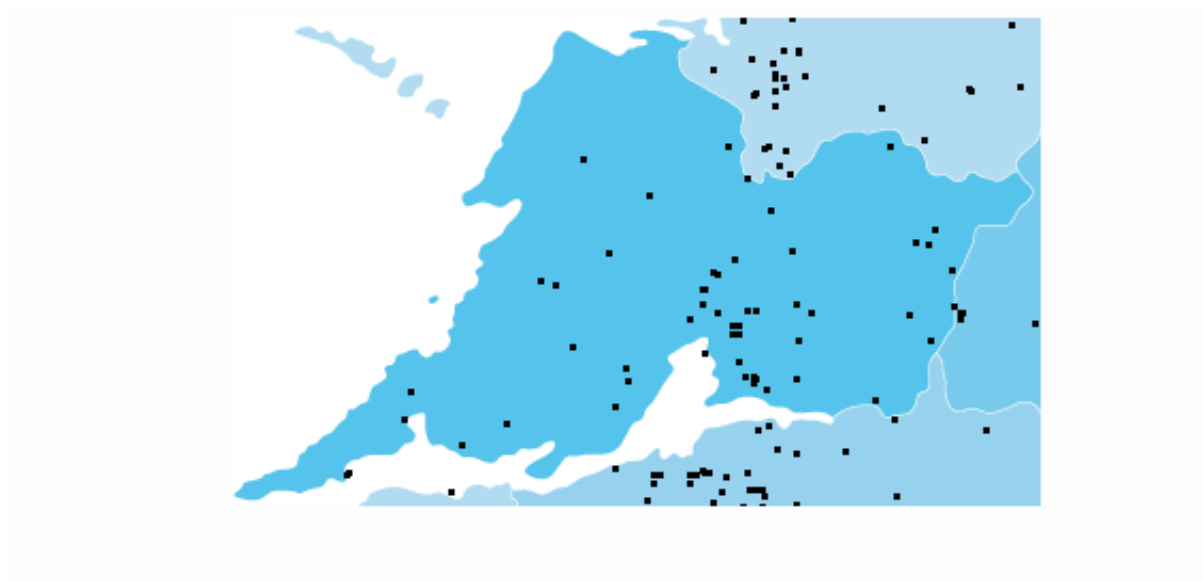


Figure 5.6-16: Common Pipistrelle Bat Records within County Clare

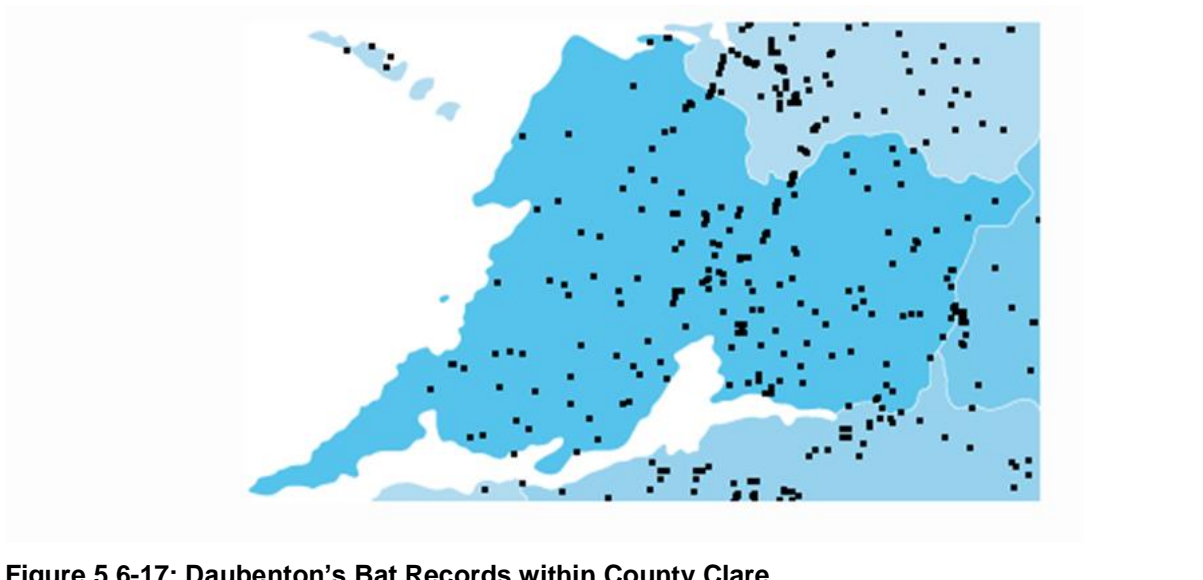


Figure 5.6-17: Daubenton's Bat Records within County Clare



Figure 5.6-18: Leisler's Bat Records within County Clare

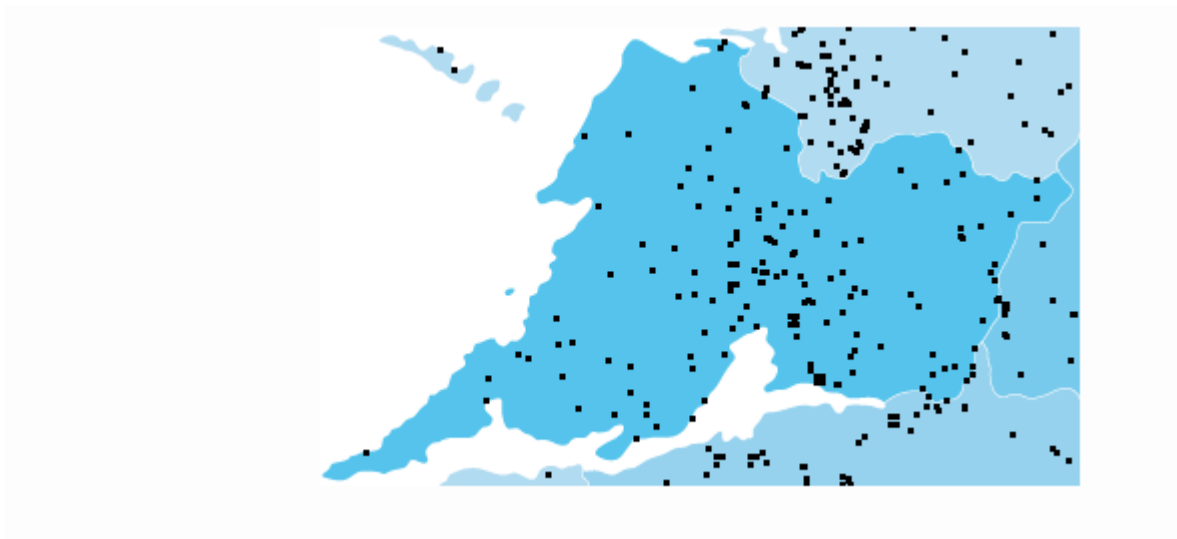


Figure 5.6-19: Natterer's Bat Records within County Clare

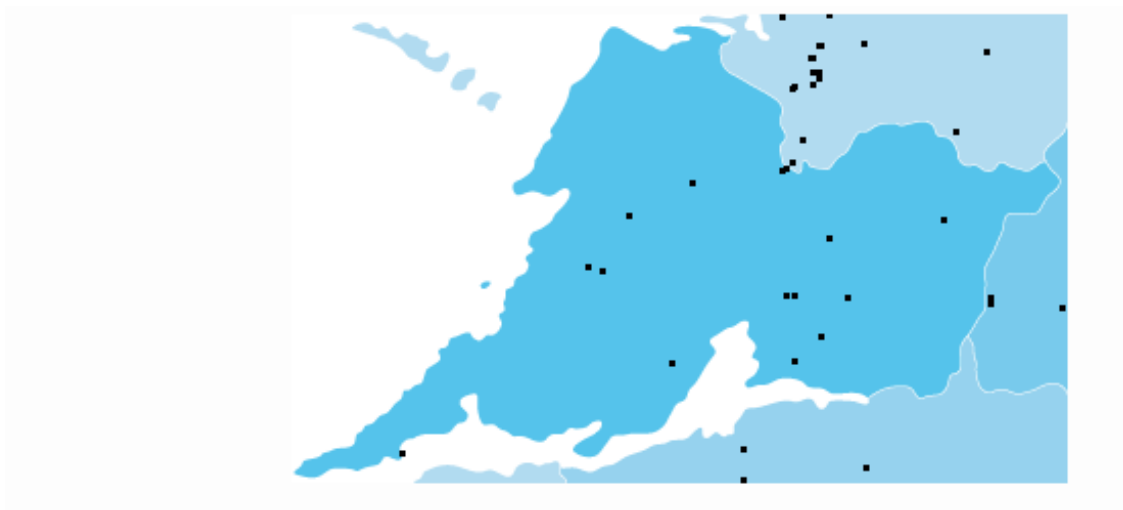


Figure 5.6-20: Soprano Pipistrelle Records within County Clare

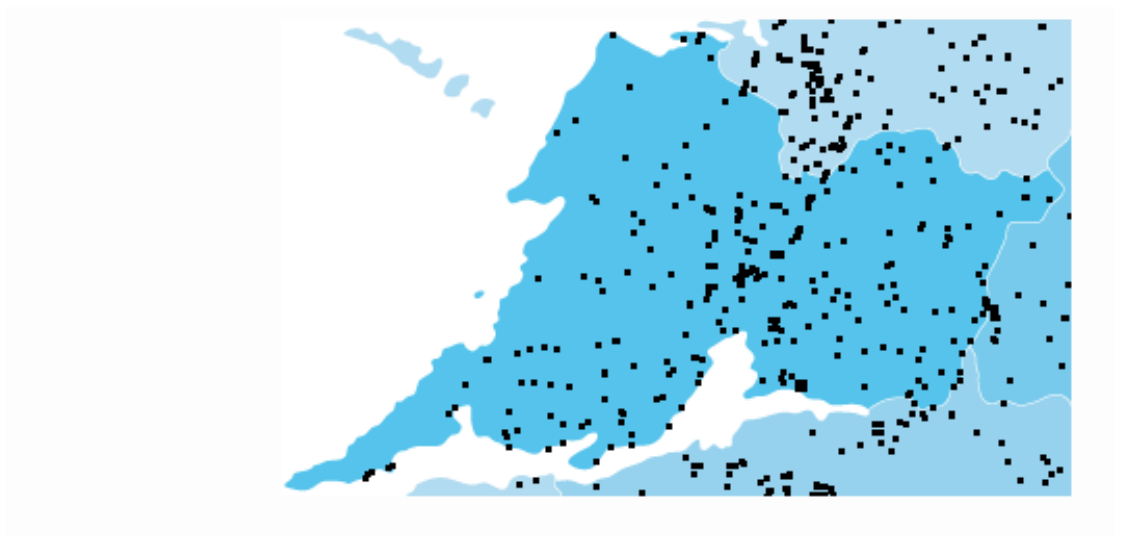


Figure 5.6-21: Whiskered Bat Records within County Clare

5.6.23 Invasive Species

Invasive species are species that have been introduced, generally by human intervention, outside their natural range and whose establishment and spread can threaten native ecosystem structure, function and delivery of services²⁸. After habitat loss, invasive species are the second biggest threat to biodiversity. There are ecological and socio-economic impacts as a result of invasive species, the extent of which are likely to increase in the Plan area without an effective management strategy including raising awareness which will inform on identification and how to reduce the risk of introducing and spreading invasive species. The EU adopted “**Regulations on the prevention and management of the introduction and spread of invasive non-native species**” (2013/0307(COD)) came into force on the 1st of January 2015. This regulation seeks to address the problem of invasive species in a comprehensive manner so as to protect native biodiversity and ecosystem services, as well as to minimize and mitigate the human health or economic impacts that these species can have.

The Regulation foresees three types of interventions; prevention, early detection and rapid eradication, and management.

The 2009 Clare Invasive Species Project provides a baseline of the known distribution of invasive species. In addition, Figure 5.6.22 provides an indication of the taxon with the data collated from a variety of sources including the National Invasive Species Database, Clare Biological Records Centre dataset, the Flora of County Clare amongst others. This map for the first time shows distinct clusters of invasive species which gives a clear indication of how the species are being transferred or spread throughout the county at an alarming rate.

The N68 contains a very distinctive cluster for Japanese Knotweed, *Fallopia japonica* moving from east to west along this route. There are two further clusters north of Tulla and west of Scarriff. Given the principal means of spread is entirely through the deliberate or accidental movement of rhizome fragments or cut stems it is highly likely that the spread along this route is through the cutting of hedgerows or the movement of excavated material either soil or vegetation along the route. Japanese knotweed has an extraordinary ability to spread vegetatively from crown, stem and rhizome (underground root) if disturbed. Even tiny amounts of cut stem, crown or rhizome are capable of producing a new plant. Controlling spread is therefore dependent on preventing the spread of the stem, crown or rhizome. Japanese knotweed can have huge consequences given its key impacts include:

- Excludes native species;
- Dies back in winter leaving river banks vulnerable to erosion;

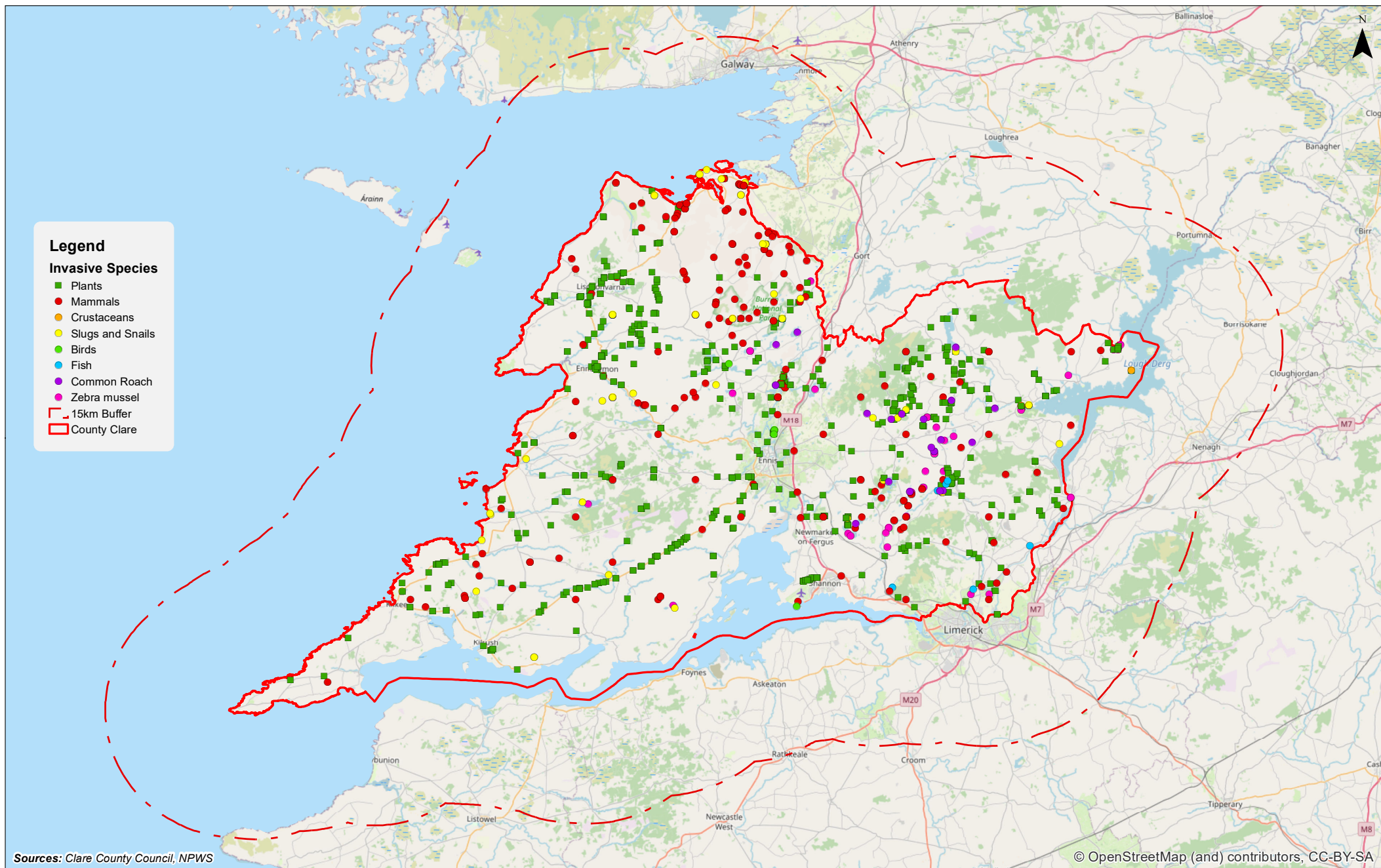
²⁸ National Biodiversity Data Centre.

- Subsequent potential sedimentation impact on fish spawning areas;
- In cases it can damage building foundations;
- Collects litter in urban areas; and
- Can damage hard surfaces by growing through them.

Himalayan knotweed (*Persicaria wallichii*) has been found in county Clare with clusters found along the R474 near Miltown Malbay and in Ennis town. Himalayan knotweed like other knotweed species was introduced as an ornamental plant and has become persistent in abandoned gardens and on roadsides or where there is garden waste.

The highly invasive Zebra mussel (*Dreissena polymorpha*) records are present within Lough Derg and a large cluster of records within the Ratty river and surrounding lakes in east Clare. Zebra mussels can be found in slow moving freshwater rivers, lakes canals and reservoirs. Zebra mussels are spread by a lack of biosecurity measures i.e. cleaning boats after use in waterways with biological disinfectants to prevent spread. There has been no County wide mapping update to Invasive species in County Clare since the 2009 Clare County Invasive Survey.

In County Clare 24 invasive alien species have been identified with a number of them established at high densities in specific environments. While not all alien species have the potential to become invasive or cause problems, there are many that can significantly alter habitats and affect the associated biota, or result in a reduction in the quality of economic services. Mapping of Invasive species within Clare County was undertaken by EirEco Environmental Consultants in 2009. See **Figure 5.6-22** for mapped invasive species within County Clare from this study.



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Clare County Council

Figure 5.6-22 Invasive Species



5.6.24 Existing Environment Threats/Pressures in the RES Area

The key issues associated with the development of a draft RES and biodiversity relate to:

- Effects on protected areas: European (e.g. SACs, SPAs, Ramsar sites) and National (e.g. (p)NHAs);
- Effects on protected species e.g. from noise, barrier to movement/ interrupted flight patterns, collisions with infrastructure;
- Potential for permanent and/or temporary habitat loss and fragmentation
- Loss or disturbance of habitats and species from land use change and changes to land management;
- Changes to soil nutrient status;
- Habitat deterioration;
- Vegetation or community changes (e.g. from land use change as well as direct changes to the environment, e.g. through emissions, fertilisation, lighting etc.)
- Potential loss of key “stepping stones” between European sites which are not afforded the same protection as SACs ad SPAs or as pNHAs or NHAs;
- Disturbance to wildlife, and particularly birds, occur as a result of inappropriately sited development and increased recreational pressure;
- Disturbance or damage to breeding, roosting and feeding areas;
- Potential introduction/ spread of alien species and invasive species;
- Potential for interaction with Habitats Directive, i.e. Articles 6, 10, 12;
- Potential Impacts on water quality (including eutrophication, sedimentation) and associated species and habitats associated with construction stage of any new developments or infrastructure;
- Potential impacts to hydrology and hydromorphology of waterbodies and associated species and habitats with construction and operational stage of instream/bankside developments or infrastructure;
- Potential impacts to groundwater and associated groundwater dependant terrestrial ecosystems during construction and/or operational stage of new developments or infrastructure;
- Changes to natural process of sedimentation and erosion;
- Introduction or increase of collision risk due to turbines;
- Changes to ecosystem services and functions, such as pollination, water attenuation and flood mitigation, climate change mitigation and adaption;
- Potential impacts on peat soils and hydrogeology, impacts on bird species, and habitat disturbance and uniquely to West Clare in particular the effects on the freshwater pearl mussel as an Annex species;
- Cumulative impacts from multiple developments and/or contribution of multiple developments to habitat loss/fragmentation and loss/disturbance to species;
- The Plan area is particularly important for Lesser Horseshoe Bats, with several designated and non-designated sites. Destruction of roosts, loss or fragmentation of commuting routes, and insensitive development and lighting can negatively impact this species;
- Potential for transboundary impacts and interactions with the above; and
- A general lack of recognition and appreciation of biodiversity outside of European sites. This is particularly relevant in relation to wildlife corridors and habitats and the role they play in the migration, dispersal and genetic exchange of wild species.

5.6.25 Evolution of the Environment in the Absence of the RES

Without implementation of the RES strict controls in respect of biodiversity flora and fauna specific to RE infrastructure may not be in place and the balance between recreation and development may be one such conflict. Also, without the RES development will not be restricted or phased to mirror delivery of the appropriate technology and infrastructure and this would also have negative impacts on biodiversity and water quality.

In the absence of the RES there is a greater risk of ad hoc/unplanned RE development and the cumulative effects of multiple windfarms, offshore development on biodiversity would not be taken into consideration adequately in the assessment process. This is likely to lead to habitat loss and/or fragmentation.

The RES and associated policies and mitigation could contribute to development occurring in a planned and sustainable manner, by incorporating ecological protection required by the Habitats Directive within an integrated planning framework for development management of vulnerable areas, which would not be presented in the absence of the RES, resulting in less effective protection of ecological resources.

At a national level the RES will contribute to reducing our greenhouse gas emissions resulting in reducing the overall long-term effects climate change is having on species and habitat ranges.

5.6.26 Data Gaps/Difficulties

- While Habitat Mapping is available for a some of the Plan area (South Clare, North-Mid Clare, Mid Clare, Mid-East Clare., Eastern Clare and Lough Derg, See **Figure 5.6.10**), it is dated and requires re-surveying. In addition, habitat mapping is also required for the entire County in order to better inform the planning process in particular at development management level.
- Bat sites have been identified, but not commuting routes.
- Set aside areas of open space specifically for biodiversity are absent in the plan area.
- A general lack of understanding in relation to water, wetlands and flooding in the Plan area. The Plan area is within a karst region, with several protected wetlands, where engineering solutions do not achieve what is needed.
- A lack of local data on invasive species in the Plan area (Clare Invasive Survey was performed in 2009), a lack of understanding in relation to invasive, a lack of recognition of invasive species, and a lack of knowledge of what to do when invasive species are identified.
- Only generic conservation objectives are available for European Sites, fairly basic, and dated, descriptions, and little information relating to how to manage threats from development.
- Whilst the NPWS Rare and Protected Species database was consulted for records of species of conservation importance, this dataset is known to be incomplete, particularly in respect to fish, bats and birds, and therefore the absence of records for a certain species does not necessarily mean that the species does not occur.
- Uncertainty of what changes will occur within elements of the environment, for example climatic change/events which would have an impact on diversity.

5.7 Population and Human Health (PHH);

5.7.1 Introduction

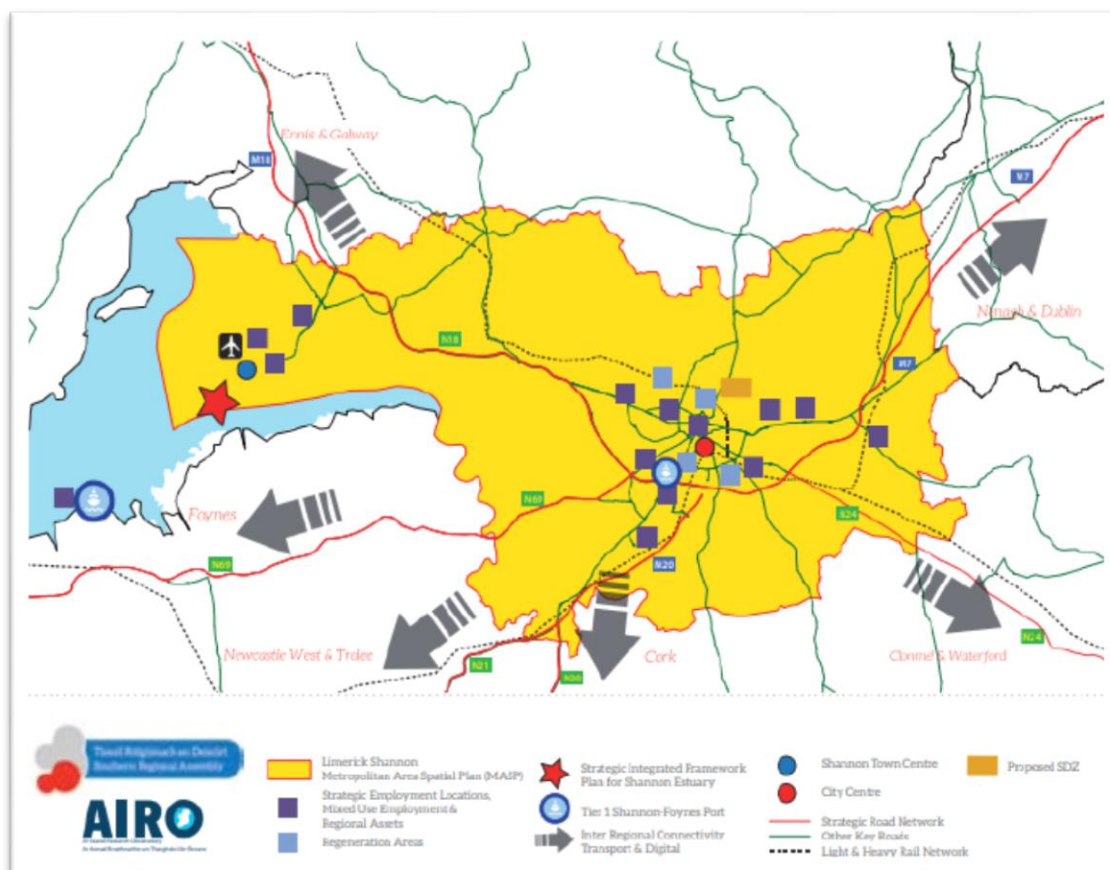
This Section sets out the existing baseline information on Population, Human Health and Quality of Life for the RES area.

Population and human health are broad topic areas within the assessment framework which encompass consideration of the presence of people, their activities, their use of the receiving environment and their wellbeing. Population distribution and growth forecasts are important indicators of both pressure on infrastructure and resources, and potential exposure to pollution and risk. In terms of health and wellbeing, these can be affected by a number of direct and indirect environmental

pathways, typically through emissions to air and water. These emissions are generally considered in the context of reference to international and national standards of safety in doses, exposure and risk.²⁹

The National Planning Framework and the Regional Spatial Economic Strategy set out transitional local authority population projections to 2031 which makes provision for the population of County Clare to grow to between 134,000-137,000 by 2031. The Regional Spatial and Economic Strategy for the Southern Region including the Limerick Shannon Metropolitan Area Strategic Plan (MASP) include interim population targets to 2026 and 2031. **Figure 5.7-1** gives an overview of the MASP area.

Figure 5.7-1: Limerick Shannon Metropolitan Area Strategic Plan



Source: Southern RSES 2018

Table 5.7.1 sets out the population targets for the MASP as outlined in the RSES.

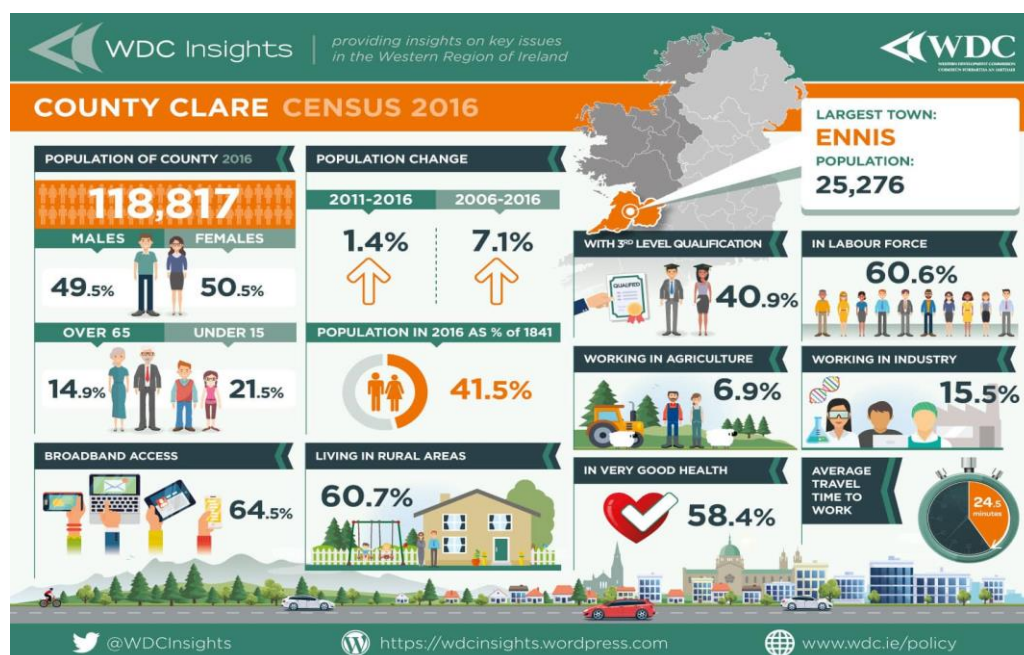
²⁹ EPA (May 2017) Revised Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Table 5.7.1: Population Targets for the MASP (Source; RSES for the Southern Region)

Area	Population 2016	Projected Population 2026	Projected Population 2031
Limerick City and Suburbs (in Limerick)	89,671	111,192	121,953
Limerick City and Suburbs (in Clare)	4,521	5,607	6,150
Subtotal	94,192	116,799	128,103
Remainder Metropolitan Area (in Limerick)	15,281	16,924	17,622
Remainder Metropolitan Area (in Clare)	22,947	25,414	26,463
Subtotal	38,228	42,337	44,085
Total Limerick Shannon Metropolitan Area	132,420	159,136	172,188

Source: Regional Spatial and Economic Strategy

The 2016 Census population data for Clare suggests that there is evidence of a continuation of strong growth with an increase of population from 2011-2016 of 1.4% and from 2006-2016 of 7.1% to the current population of 118,817 in County Clare. Our largest town of Ennis has a population of 25,276.

Figure 5.7-2: Key Census 2016 statistics for County Clare

The National Spatial Strategy and the Mid-West Regional Planning Guidelines 2010-2022 have now been superseded by the National Planning Framework (NPF) and the Regional Spatial and Economic Strategy for the Southern Region (RSES) and will inform the preparation of the RES.

The RSES gives effect, at a regional level, to the National Planning Framework together with the National Development Plan. The RSES provides a regional framework for the formulation of the policies and objectives and the overall strategy for sustainable development in Clare and seeks to ensure the proper balance between the different settlements in the region with regard to development, population and services.

The National Planning Framework

The National Planning Framework is a planning framework to guide development and investment over the coming years along with the growth of Ireland's population. It does not provide every detail for every part of the country; rather it empowers each region to lead in the planning and development of their communities, containing a set of national objectives and key principles from which more detailed and refined plans will follow. The companion to the NPF is the National Development Plan, a ten year strategy for public capital investment of almost €116 Billion. Together the NPF and the NDP is referred to as Project Ireland 2040.

The Regional Spatial and Economic Strategy

The RSES for the Southern Region is a 12 year strategic regional development framework for the future physical, economic and social development of the region and to guide change. It establishes a broad framework for the way in which our society, environment, economy and the use of land should evolve. It includes Metropolitan Area Strategic Plans (MASPs) for Limerick-Shannon, Cork and Waterford.

The RSES primarily aims to support the delivery of the programme for change set out in Project Ireland 2040, the National Planning Framework (NPF) and the National Development Plan 2018-2027 (NDP) by marrying regional spatial and economic planning together for the first time in Ireland. As the regional tier of the national planning process, it will ensure coordination between the City and County Development Plans (CCDP) and Local Enterprise and Community Plans (LECP) of the ten local authorities in the Region.

The level of change required by the NPF cannot be implemented immediately and it will take several cycles of the RSES process to achieve change to long-term patterns of sustainable development. This first RSES is primarily concerned with setting the course to embed long term change.

The RSES recognises the strategic role played by all areas, urban and rural, in achieving the set regional and national targets and objectives. Support for sustainable growth of all communities, urban and rural, are supported by the RSES. A strategy is pursued that builds on cities and metropolitan areas as engines of growth and seeks in parallel to re-position the region's strong network of towns, villages and diverse rural areas in an economically resilient, imaginative and smart manner to create a sustainable competitive advantage for the region.

The NPF and the RSES set out Transitional Local Authority Population Projections to 2031. **Table 5.7.2** specifies the County Clare population projections to 2031 as set out in the National Planning Framework.

Table 5.7.2: Population Projections to 2031 as set out in the NPF

	2016	2026	Uplift 2016 to 2026	2031	Uplift 2016 to 2031
County Clare	119,000	129,500-131,500	10,500– 12,500	134,000-137,000	15,000- 18,000

Source; NPF Implementation Roadmap – July 2018 – DoHPLG

The population growth provided for County Clare under the RSES is much less than that set out in the previous period in the National Spatial Strategy (NSS) and the Mid-West Regional Planning Guidelines 2010-2022. While some concern is expressed as to the new modest population targets the following should be kept in mind:

- The sub-regional targets of the Mid-West Regional Planning Guidelines 2010-2022 were based on each county and city retaining the same % of the target regional population that it had at the time of 2006 Population Census.
- The targets set out in the RSES is based on a dual tract strategy that builds on the cities, metropolitan areas as significantly scaled engines of growth, and supports opportunities for sustainable competitive advantage by repositioning the regions strong network of towns, villages and rural areas.
- The actual population growth versus the target population growth in the 10 year period from 2006-2016 was 7% rather than the 18% target.

- The actual population growth over a 25 year period for County Clare 1.2% (compound)
- The NPF figure allows for a 0.96% annual growth.

Therefore, the Core Strategy of the forthcoming plan 2022 to 2028 must realign its population growth and residential zoning with the reduced population target of the RSES for both the County and that area of the county within the Limerick/Shannon Metropolitan Area.

To do so, consideration needs to be given to the overall settlement strategy which will set out the development framework for the county, which will give spatial expression to the population distribution and settlement hierarchy.

Table 5.7.3: Projected Populations 2026 and 2031 for the Limerick-Shannon Metropolitan Area

Area	Population 2016	Projected Population 2026	Projected Population 2031
Limerick City and Suburbs (in Limerick)	89,671	111,192	121,953
Limerick City and Suburbs (in Clare)	4,521	5,607	6,150
Sub-Total	94,192	116,799	128,103
Remainder Metropolitan Area (in Limerick)	15,281	16,924	17,622
Remainder Metropolitan Area (in Clare)	22,947	25,414	26,463
Sub-Total	38,228	42,337	44,085
Total Limerick Shannon Metropolitan Area	132,420	159,136	172,188

Source; Regional Spatial and Economic Strategy

5.7.2 Population

Ennis, with a population of 25,276 people in the 2016 Census is the largest settlement in County Clare, is the largest town in Munster, and is the fifth largest settlement in the Southern Region. It is designated as a “Key Town” in the Regional Spatial and Economic Strategy for the Southern Region, and as the County Town for Clare is an important residential, service and commercial centre providing significant levels of employment. The Regional Spatial and Economic Strategy for the Southern Region also recognises the Limerick-Shannon- Ennis triangle as the economic engine of the Mid-West. Ennis is at the top of the Settlement Hierarchy for the County and a new local area plan to guide and support the future development of Ennis and its environs will be prepared during the lifetime of the Development Plan 2023-2029, to which this RES form part of. In addition to the preparation of the local area plan the ‘*Ennis 2040 – Economic and Spatial Strategy*’ will create a long-term strategy for the sustainable development of the Town.

Shannon Town was developed from the 1960’s onwards in response to the growth and development of Shannon Airport and the Shannon Free Zone Industrial Estate and in 2016 had a population of 9,729 people. It is a world leader in aviation, manufacturing and distribution, occupies a strategic position to the west of Ireland, is a centre of international business, has strong synergies with Limerick City, Ennis and the wider Region and is central to delivering the ambition for the Limerick-Shannon Metropolitan Area’s economic, social diversity and tourism development. The Regional Spatial and Economic Strategy for the Southern Region identifies Shannon for significant population growth (i.e. greater than a 30% increase by 2040). The Limerick-Shannon Metropolitan Area Strategic Plan identifies a significant opportunity for Shannon to expand as a globally recognised centre for software engineering/aviation/logistics talent and supports Shannon as a centre for research and development for autonomous vehicles. A new local area plan to guide and support the future development of Shannon Town and its Environs will be prepared during the lifetime of this Development Plan. In addition, Clare County Council are currently preparing a Shannon Town Masterplan. The purpose of the masterplan is to define the focus for economic, spatial and property development for Shannon Town Centre. It is intended that the masterplan will unlock the development potential and guide and stimulate the future economic and landuse development of all lands within Shannon Town Centre.

5.7.3 Accommodation Profile

According to the CSO data for 2016, there are a total of 43,468 households within County Clare of which the majority were houses and bungalows as outlined in **Table 5.7.4**. As identified in **Table 5.7.5** there has been a steady increase each year in the number of homes built, with clear peaks during the 1991 to 2000 period and again from 2001 to 2005.

Table 5.7.4: Private Households by Type of Accommodation in County Clare

Type of Accommodation	Households	Persons
House/Bungalow	40,471	110,735
Flat/Apartment	2,297	4,400
Bed-sit	33	67
Caravan/Mobile home	121	235
Not Stated	547	1,483
Total	43,468	116,920

Source; Census 2016

Table 5.7.5: Permanent Private Households by Year Built in County Clare

Year Built	Households	Persons
Pre 1919	3,690	7,779
1919 to 1945	2,401	5,011
1946 to 1960	2,347	5,161
1961 to 1970	3,123	7,144
1971 to 1980	5,679	13,734
1981 to 1990	4,812	12,949
1991 to 2000	6,712	20,796
2001 to 2005	11,406	35,573
2006 or later	865	2,571
Not stated	2,286	5,967
Total	43,348	116,685

Source; Census 2016

5.7.4 Age Profile

The bar chart in **Figure 5.7-4** shows the age structure of the County population male and female as recorded on Census Night 2016. Clare has a large percentage of its population for both males and females in the 0-15 age groups category. While the total of both sexes have increased over the census period there are more females than males living in County Clare in 2016.

Age dependency shows the ratio of the old and young population to the population of working age. The young dependency ratio is the number of young people aged 0 -14 as a percentage of the population of working age.

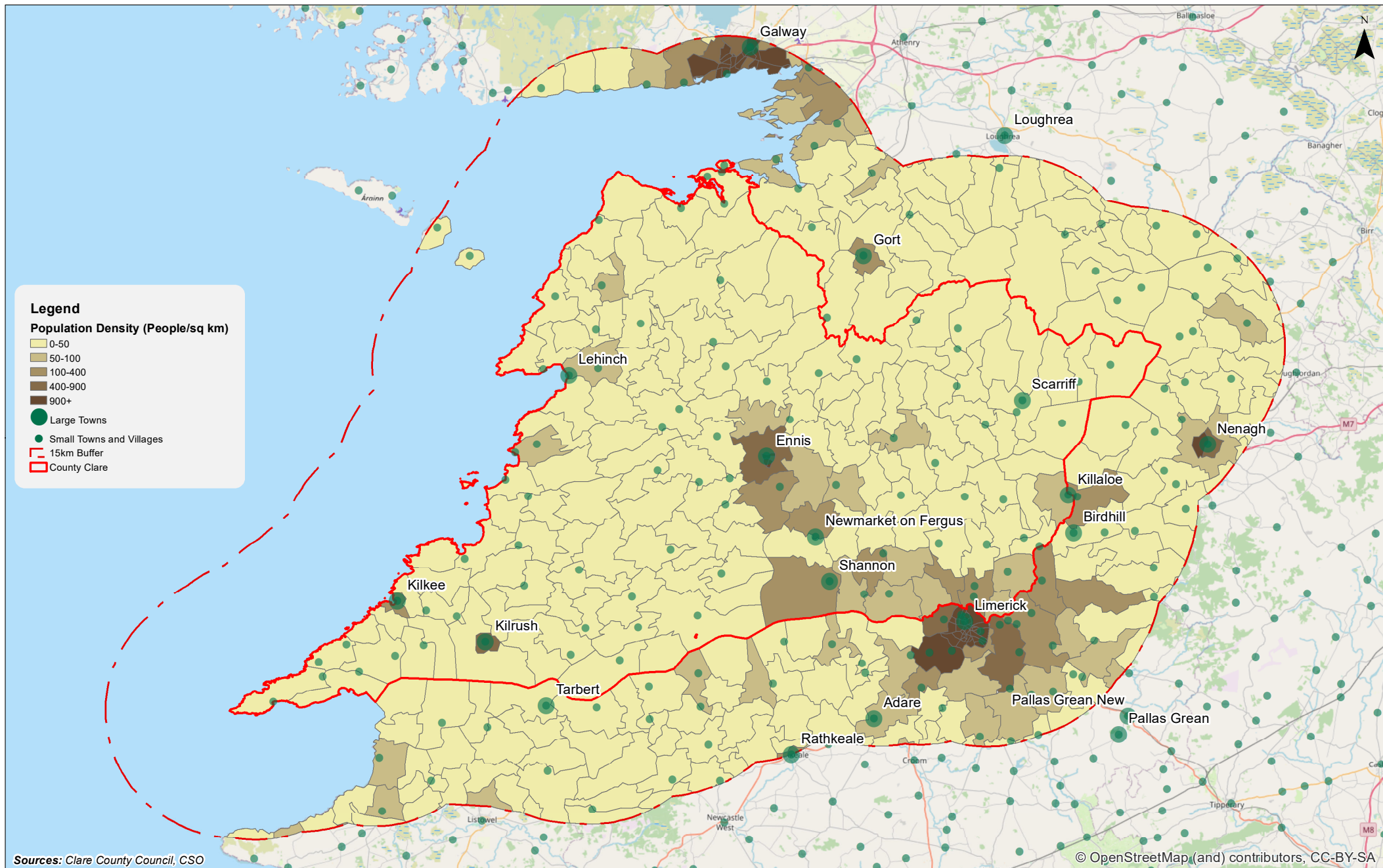
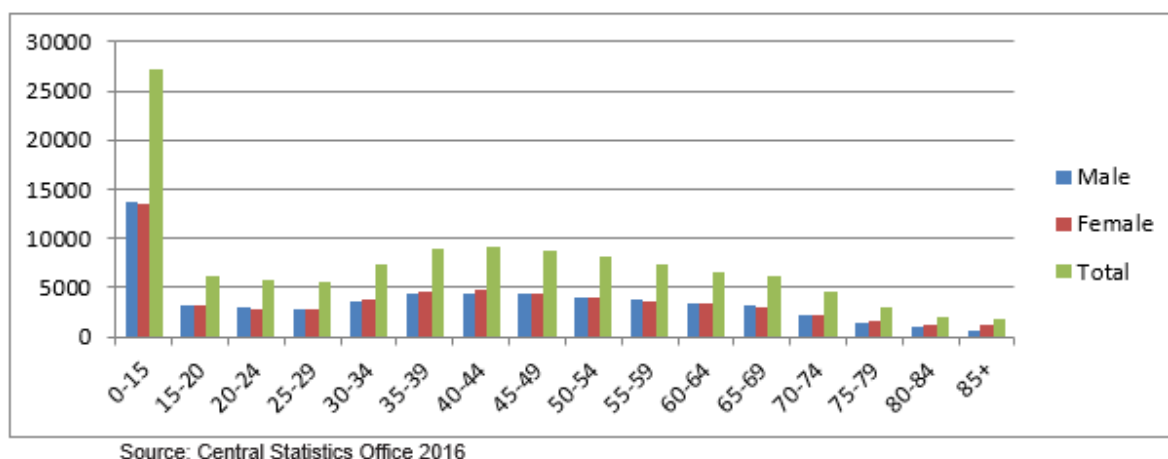
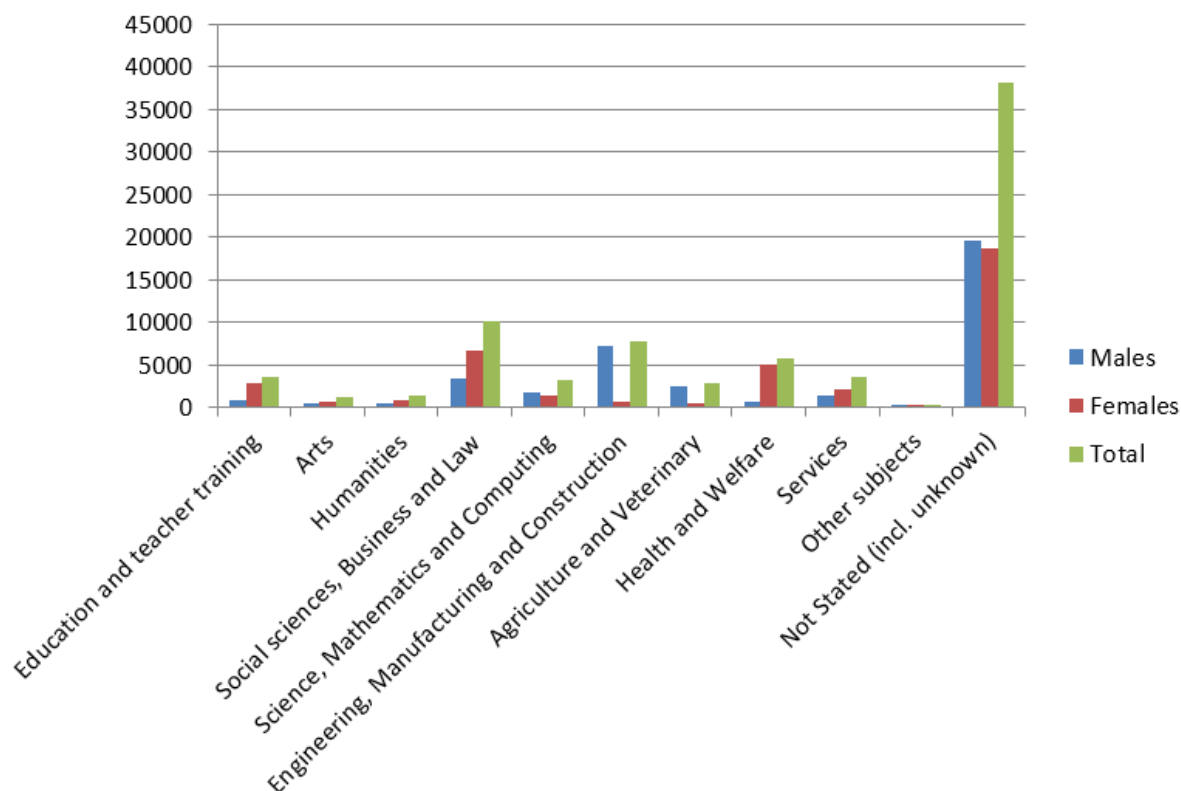


Figure 5.7-4: Clare Age Profile 2016

5.7.5 Education Profile

Figure 5.7-5 identifies the population aged 15 years and over by highest level of education completed. From an analysis of these figures, Clare has seen an increase in the number who are progressing to completion of upper secondary education or higher when compared with 2011/2016 coupled with third level education and other forms of continued further education. This reflects the changes which took place during the down turn in the economy with fewer jobs and opportunities arising and therefore the return to education for a greater proportion of the population. It also reflects the changing nature of industry in requiring a higher level of skill and education for its workforce and the competitive nature of the jobs market which now requires graduates at the highest level of education.

Figure 5.7-5: Population aged 15 Years and Over by Highest Level of Education Completed

5.7.6 Employment & Economy

The 2016 Census figures (**Table 5.7.6**) showed that 53% of the total population aged 15 years and over in county Clare were at work which represents a significant drop from 2011. The unemployment rate based on a principal economic status basis measures the percentage of people in the labour force who were either looking for their first job or unemployed. The unemployment rate for Clare (taking the principal economic status classes; Unemployed looking for first regular job & Unemployed having lost or given up previous job) stood at 7.5% in the 2016 Census, representing a decrease of increase from 1.4% from 2011.

Table 5.7.6: Population Aged 15 Years and Over by Principal Economic Status and Sex

Principal Economic Status	Male	Female	Total
At work	26,611	22,900	49,511
Looking for first regular job	381	285	666
Unemployed having lost or given up previous job	3,696	2,656	6,352
Student	5,063	5,360	10,423
Looking after home/family	531	6,878	7,409
Retired	7,650	7,336	14,986
Unable to work due to permanent sickness or disability	1,737	1,846	3,583
Other	133	182	315
Total	45,802	47,443	93,245

Source: Central Statistics Office 2016

The key economic sector in Clare accounting for 28 per cent of the working population of County Clare was managerial and technical which is a change from the non-manual sector in 2011. This was followed by non-manual sector. Skilled manual and semi-skilled make up the majority of the remaining classes which reflects the rural nature of the county.

Table 5.7.7: Persons at Work by Industry and Sex

Social Class	Male	Female	Total
Professional workers	4,840	3,977	8,817
Managerial and technical	15,611	18,229	33,840
Non-manual	8,271	12,971	21,242
Skilled manual	11,524	6,158	17,682
Semi-skilled	6,835	6,058	12,893
Unskilled	2,293	1,670	3,963
All others gainfully occupied and unknown	9,411	10,969	20,380
Total	58,785	60,032	118,817

Source: Central Statistics Office 2016

5.7.7 Human Health and Quality of Life

The cumulative effects of population change can impact on human health and quality of life. Direct effects relate to matters such as water and air quality, noise, and landscape change. Indirect effects relate to such matters as flora and fauna. Issues relating to radon and noise are mentioned here and associated effects of transport, material assets, air quality and climate change are discussed in more detail in the relevant sections.

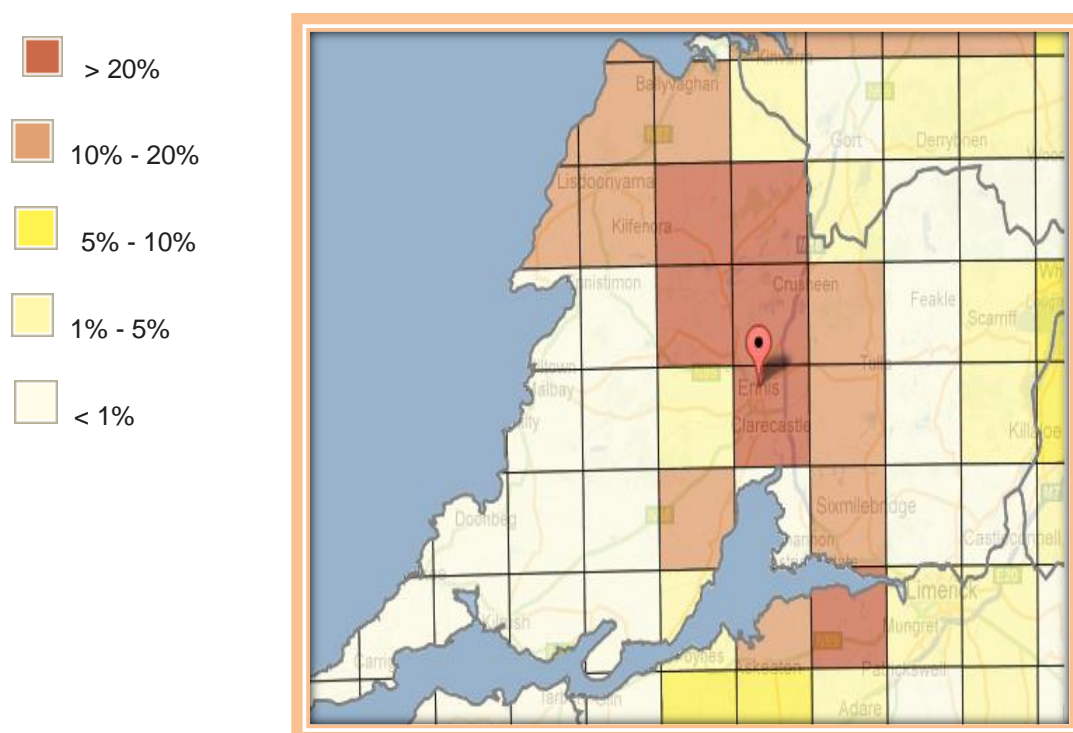
General Health and Wellbeing

The CSO publication *Ireland's Health Survey* (2019) is part of an EU-wide survey looking at general health indicators based on reporting from people aged 15 years and older. Health in Ireland is generally very good; 82% of people surveyed reported no limitations in their daily activities from a health condition, and 85% overall reported their health as being *good* or *very good*. There is also a clear socio-economic divide however, with 92% of *very affluent* people reporting *good* or *very good* health status compared to 78% of *very disadvantaged* people. Employed people are also more likely to report better physical and mental health

Radon

Radon levels in the County have been collated from the Radiological Protection Institute of Ireland. The estimated percentage of homes above the Reference Level is indicated on **Figure 5.7.6** as per the associated legend. As evidenced, the central portion of the development Plan Area is situated in a high radon area. A High Radon Area is any area where it is predicted that 10% or more of homes will exceed the Reference Level of 200 Bq/m³.

Figure 5.7-6: Estimated Percentage of Homes above the Reference Level in Co. Clare



Source: Radiological Protection Institute of Ireland

Noise

Noise can have a significant effect on an individual's quality of life. Urban areas generally experience a higher level of background noise caused by traffic from roads, junctions or congestion, other transport facilities and routes e.g. bus, train and air; industrial areas due to their operating activity and/or traffic movements they generate in terms of their workforce, deliveries etc; late night activities and uses in neighbourhood centres e.g. late night take-aways and late night deliveries; construction activities on development sites etc. Environmental noise is defined by the EU as "*unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport and sites of industrial activity*".

More specifically in relation to RE developments, noise can arise mainly during the construction phase of any infrastructural development, and there can also be noise which arises during the operational lifetime of a development. With wind energy dominating the renewable energy market, the two main source of noise arising from the operation of wind turbines relates to aerodynamic noise resulting from the movement of the blades through the air (or 'swish'), as well as mechanical noise

generated from parts within the turbine's nacelle. The level of noise generated is a function of a number of factors such as wind speed, turbine and gearbox design.

The Clare Noise Action Plan 2018 was prepared by Clare County Council to address environmental noise from major roads with more than three million vehicles per annum. The action planning area covers the M18, N18, N19, N68, N85, Sections of R445, R458, R463, R352, R468, R471. It follows on from the preparation of the 2013 Noise Action Plan which addressed environmental noise from roads with more than three million vehicles per annum and the 2008 Noise Action Plan which addressed environmental noise from roads with more than six million vehicles p.a. The plan has been prepared in accordance with the requirements of EU Directive 2002/49/EC (known as the Environmental Noise Directive, or "END"), which was transposed into Irish Law by the Environmental Noise Regulations 2006, SI No. 140 of 2006.

Noise within the Plan area is dominated by that generated by road traffic, in particular the M18, N85 and the R458 (Old Limerick to Galway Road). Since the construction of the M18 traffic generated noise levels along the old national routes within the urban area has decreased. The level of environmental noise generated by road traffic is dependent on a range of factors including the number of vehicles, the speed of vehicles, the road surface and the incline. The extent to which noise travels from the road is affected mainly by distance, weather, presence of acoustic barriers, buildings, roads width, road incline, topography and vehicle noise.

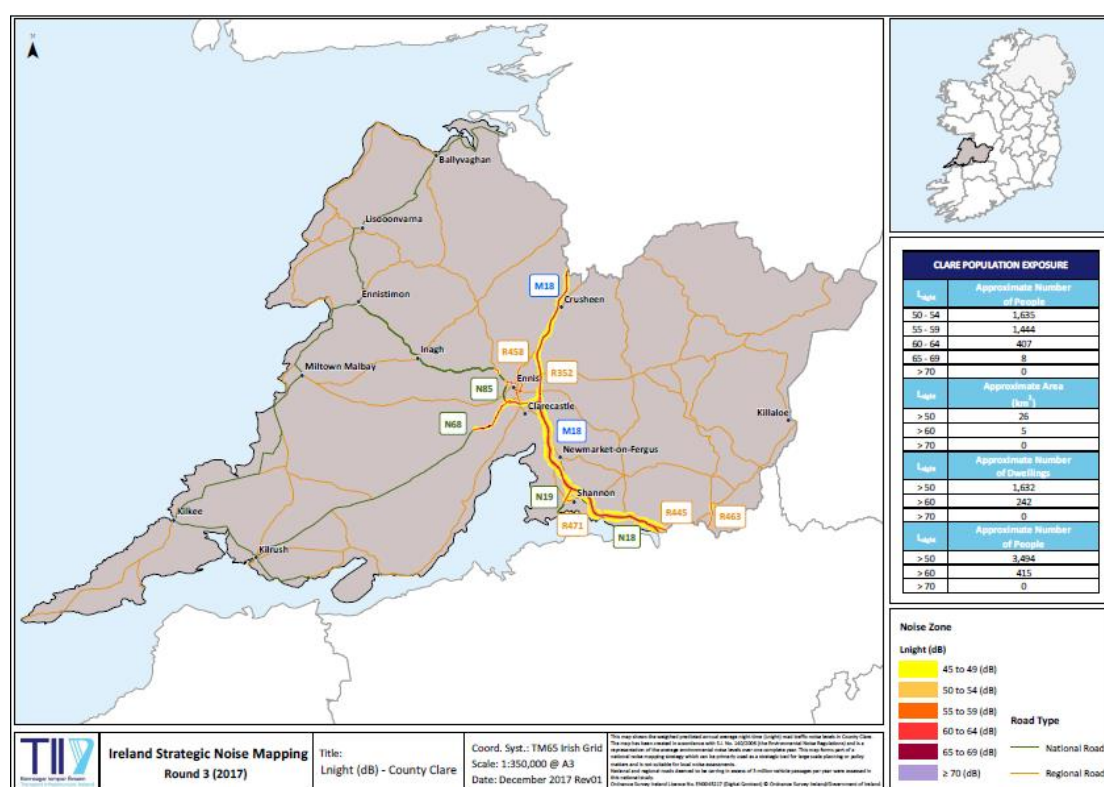
A general overview of the noise climate in County Clare can be obtained through examination of the strategic noise mapping. The purpose of the strategic noise maps is to identify the areas affected by different levels of environmental noise from major roads, railways, airports and agglomerations. The maps are a visual representation of estimated noise contour bands within the action plan area from 55dB Lden to greater than 75dB Lden, in 5dB bands. The maps have been linked to population data to estimate the numbers of people located in each environmental noise bands. This information is then used to produce noise action plans, which will endeavour to manage existing environmental noise from the major sources and protect the future noise environment.

Transport Infrastructure Ireland (TII) formerly the National Roads Authority (NRA), as the noise mapping body for major national roads, has prepared noise maps for the sections of the National Routes – (M and N routes) in Clare that were confirmed by verified vehicle count data to have more than 3 million vehicles per annum. TII on behalf of Clare County Council has prepared noise maps for Regional roads (R route) with more than 3 million vehicles per annum. TII has estimated from the noise maps and from GeoDirectory data that approximately 6,629 individuals living within the action planning area in Clare may be located in environmental noise bands from 55 to >75dB Lden. Approximately 4,279 individuals may be located in noise bands from 50 to >70dB Lnight.

The TII noise mapping for county Clare is shown in

Figure 5.7-7.

Figure 5.7-7: Noise Mapping for County Clare



Another source of noise is Shannon International Airport, though this is localised and predominately throughout the day time hours. The reopening of a number of railway stops and the connection of the railway line from Ennis to Galway has also led to additional noise levels in particular through various settlements such as Cratloe, Sixmilebridge, Ennis and Crusheen. Given the type of commuter train largely used on this line noise levels are minimal causing little disturbance.

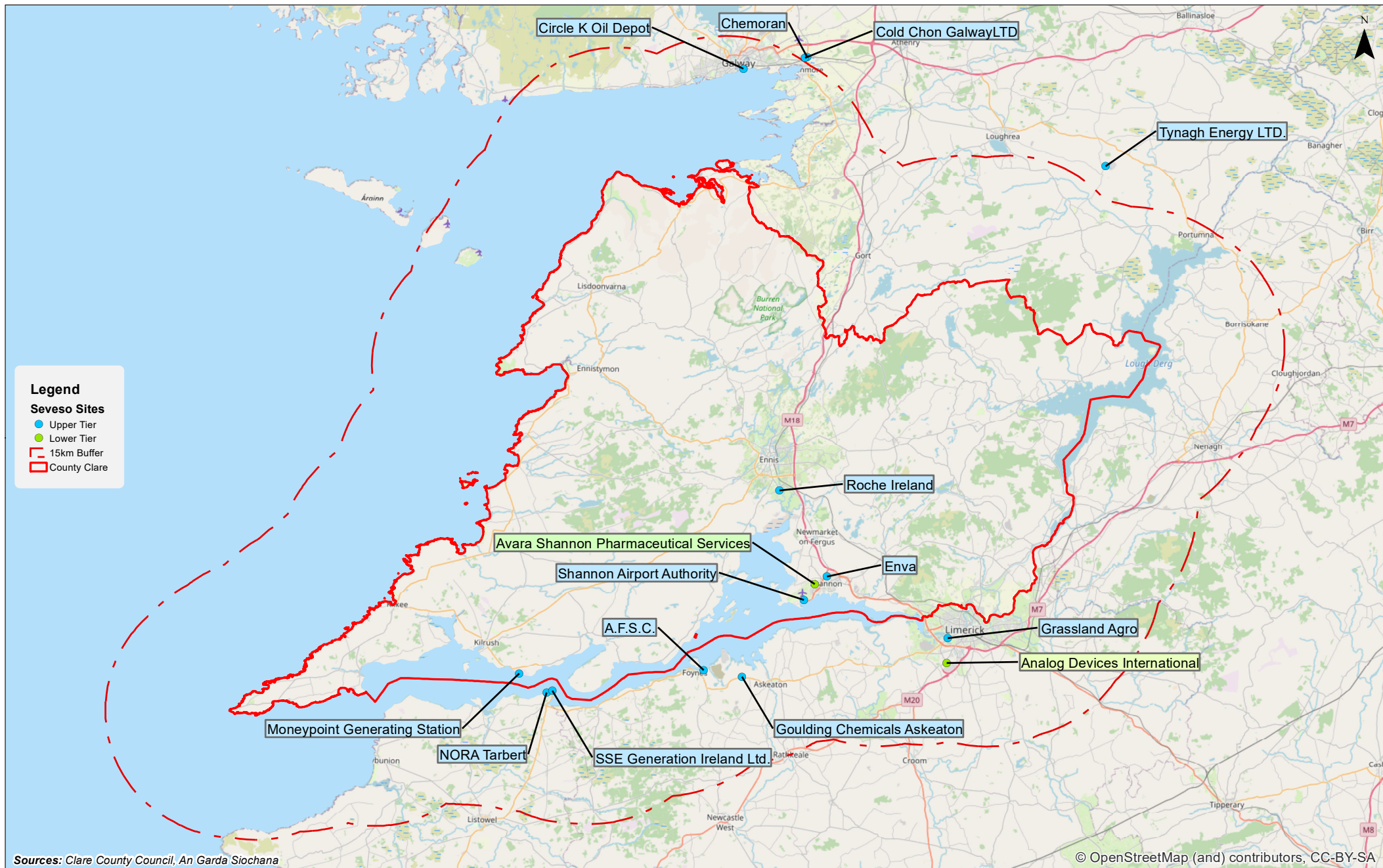
Air Pollution

Air pollution is also recognised as a significant public health burden in terms of illness and premature death associated with air pollution generally, and from the transport sector in particular. Continued use of solid fossil fuels for domestic usage and the increasing vehicle fleet leading to emissions of particulate matter and nitrous oxides are significant issues. It should be noted that the National Clean Air Strategy is currently being prepared by DCCA with the intention of developing the necessary policies and measures to comply with new and emerging EU legislation, in addition to supporting

climate change mitigation. Development of renewable energy can contribute to positive health impacts by significantly improve air quality through the progressive offsetting of fossil fuel combustion for energy generation at source, and also for example, through uptake of electric vehicles which have no tailpipe emissions (but which create indirect emissions depending on the fuel/energy mix supplying the electricity grid). Air quality is discussed in detail in **Section 5.9.1**.

Seveso Sites

Seveso sites are those which store significant amounts of dangerous or harmful substances and proximity to these sites could represent a potential impact to human health. They are regulated under the COMAH regulations (Control of Major Accident Hazards Involving Dangerous Substances; S.I.476 of 2000). There are five Seveso site in County Clare, two Upper Tier sites and one Lower Tier Sites (representing thresholds of 50 and 200 tonnes respectively). These three sites and their locations are given in the following table and illustrated in **Figure 5.7-8**. The most significant change to this list from the last RES is the removal of Roche Pharmaceuticals as operations have creased at the site with plans granted for a full remediation of the plant back to Greenfield conditions. This represents a significant improvement to human health not only within close proximity to the facility but right across the county as emissions to air and water are removed together with the considerable remediation works that will be involved in removing any contaminated material which was historical stored or landfilled onsite.



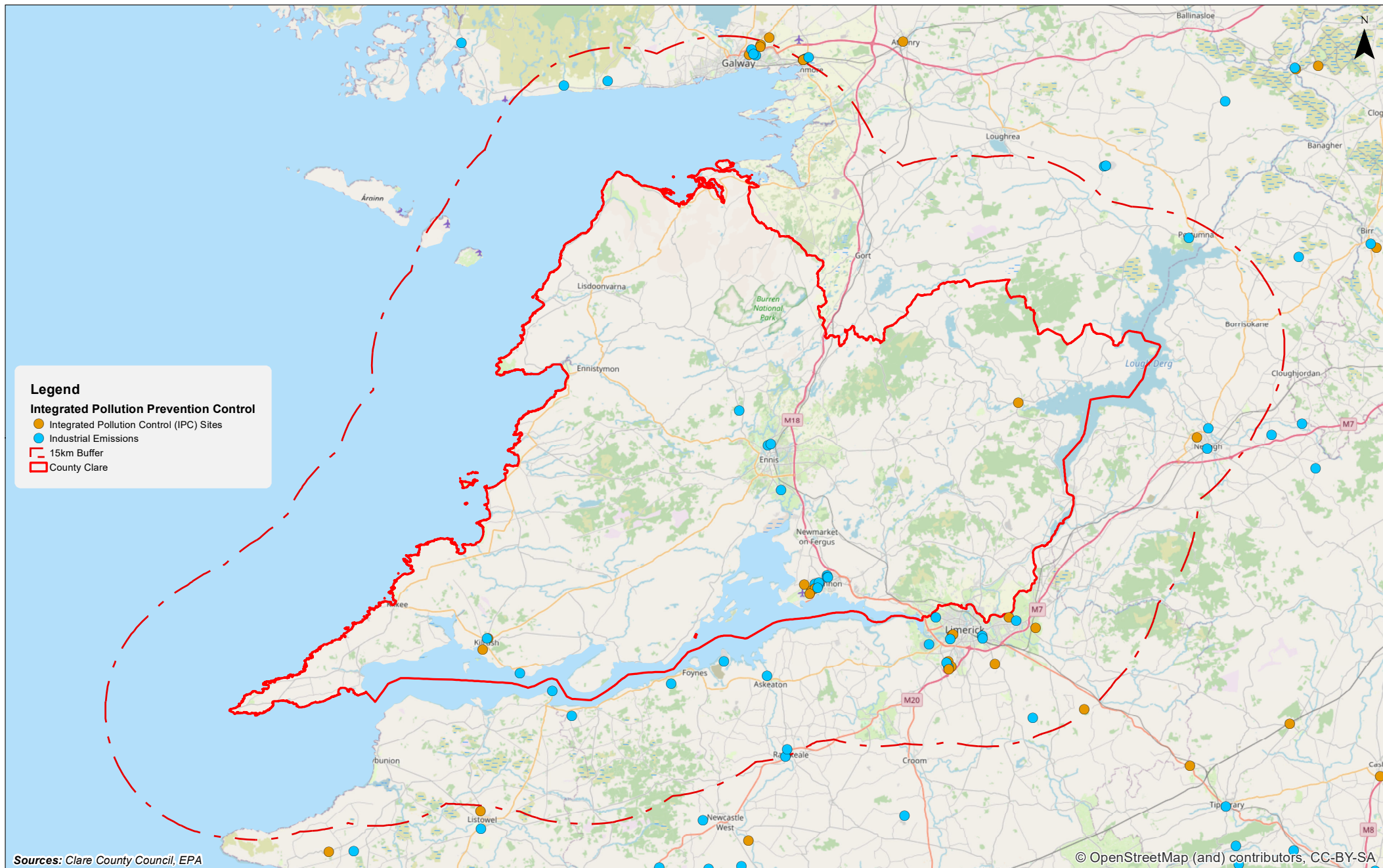


Table 5.7.8: Seveso Sites in County Clare

Establishment Name	Establishment Address
Upper Tier Sites	
ESB Moneypoint Generating Station	Kilrush, Co. Clare
Shannon Aviation Fuels	Aer Rianta Fuel Farm, Shannon Airport, Shannon, Co. Clare
Lower Tier Sites	
Enva Ireland Ltd (t/a Enva)	Smithstown Industrial Estate, Shannon, Co. Clare

Integrated Pollution Control (IPC) sites

The EPA has been licensing certain activities since 1994. IPC licensing is governed by the Environmental Protection Agency Act 1992 as amended. Detailed procedures concerning the IPC licensing process are set out in the EPA Act 1992 as amended, and the associated licensing regulations.

IPC licences aim to prevent or reduce emissions to air, water and land, reduce waste and use energy/resources efficiently. An IPC licence is a single integrated licence which covers all emissions from the facility and its environmental management. All related operations that the licence holder carries in connection with the activity are controlled by this licence. There are 7 IPC facilities in the RES area as outlined in **Table 5.7.9** and shown in **Figure 5.7-9** which represents a reduction of 9 from the last Plan. This is due largely to the closure of many of the larger facilities and pharmaceutical companies such as Roche in Clarecastle and Molex in Shannon which represents an overall improvement for the county in terms of human health.

Table 5.7.9: IPC Licenced Activities in County Clare

Facility	IPC No.	Location	Principle Activity
Finsa Forest Products Limited	P0022-02	Scarriff, Co. Clare	Wood, Paper, Textiles and Leather
Lufthansa Technik Shannon Ltd	P0069-02	Shannon Airport, Shannon, Co. Clare	Surface Coating
Saint-Gobain Performance Plastics Ireland	P0096-02	Kilrush, co. Clare	Surface Coating
Heraeus Metal Processing Limited	P0145-01	No. 75, Shannon Industrial estate, Shannon, Co. Clare	Metals
Shannonside Building Supplies Limited	P0319-01	Fort road, Kilrush, Co. Clare	Wood, paper, textiles, leather
International Aerospace Coatings Limited	P0497-02	Shannon Airport, Shannon, county Clare	Surface coating
Element Six	P0533-01	Bay 371, Shannon Industrial Estate, Shannon, co. Clare	Mineral Fibres and Glass

Pollutant Release and Transfer Register

Ireland's [Pollutant Release and Transfer Register](#) (PRTR) provides a publicly accessible and searchable database which members of the public can use to search for installations in Ireland which are releasing [PRTR pollutants](#) in excess of specific thresholds or making off-site transfers of waste above specified thresholds for non-hazardous and hazardous wastes. The register also fulfils requirements of the Aarhus Convention, as a simple means of affording access to information about environmental emissions and transfers.

There are fourteen licensed PRTR facilities within the RES area (**Table 5.7.10**) - Roche Ireland Ltd. in Clarecastle and Essidev S.A. in the Gort Road Industrial Estate.

Table 5.7.10: Licensed PRTR Facilities County Clare

PRTR Title	Reg. No	Licence Type	Main PRTR Sector	Main PRTR Activity
Roche Ireland Limited: P0012-05	P0012-05	IEL	Chemical industry	4.(e)
Eirchem Pharma Services Limited: P0020-02	P0020-02	IEL	Chemical industry	4.(e)
Essidev S.A.: P0061-03	P0061-03	IEL	Chemical industry	4.(a).(viii)
ITW Ireland Unlimited Company: P0072-04	P0072-04	IEL	Chemical industry	4.(a).(ii)
Chemifloc Limited: P0076-01	P0076-01	IEL	Chemical industry	4.(b).(iv)
Heraeus Metal Processing Limited: P0145-01	P0145-01	IPC	Chemical industry	4.(b).(v)
Molex Ireland Limited: P0288-02	P0288-02	IEL	Production and processing of metals	2.(f)
Galvotech (International) Limited: P0292-01	P0292-01	IEL	Production and processing of metals	2.(f)
Electricity Supply Board: P0605-04	P0605-04	IEL	Energy sector	1.(c)
Clogrennane Lime Limited: P0771-02	P0771-02	IEL	Mineral industry	3.(c).(iii)
Clare County Council: W0037-01	W0037-01	IEL	Waste and wastewater management	5.(d)
Enva Ireland Limited: W0041-01	W0041-01	IEL	Waste and wastewater management	5.(a)
Clare County Council: W0109-02	W0109-02	IEL	Waste and wastewater management	5.(d)
Clean (Irl) Refuse & Recycling Co: W0253-01	W0253-01	IEL	Waste and wastewater management	5.(c)

Clean Water

Clean water is important to a population's general health. Ireland has in general good water quality and consequently the health of the population benefits from having it. There are many potential contaminant sources that pose a risk to Ireland's clean water supply. The main potential risks to human health come from biological sources (verotoxigenic *E. coli* [VTEC], *Cryptosporidium* etc.) and chemical sources (fertilisers, pesticides, herbicides, trihalomethanes (THMs), heavy metals and pharmaceuticals, etc.). In addition, the development of infrastructure may have the potential to have a negative impact on water quality in some instances.

Dark Sky Reserves

Artificial lighting is a product of our modern world and is essential to the functioning of our built environments. However light pollution can also have a negative impact on people's health and wellbeing, on biodiversity and also on climate, through unnecessary energy use; lighting in Ireland has increased approx. 60% between 1995 and 2015.³⁰ These areas are particularly sensitive to any lighting or flicker that could arise from RE projects. There are no International Dark Sky Park reserves in County Clare or adjoining counties.

³⁰ Dark Sky Ireland: <https://www.darksky.ie/>

Electromagnetic Fields

Most health concerns regarding cables and powerlines are in relation to the generation of electromagnetic fields (EMF), which are the physical fields produced by any charged electrical object, and potential health concerns therefore in relation to high voltage overhead lines located near to population centres. EMF can also be generated by natural sources; however everyday exposure to non-natural sources of electrical and magnetic EMF is increasing in tandem with continued infrastructural developments and technological advancements (e.g. mobile phones, wireless communications, household appliances).

EMF comes in two forms based on frequency: non-ionising radiation (generally thought to have no effect on human health) and ionising radiation (potential to cause cellular or DNA damage). Non-ionising radiation falls within the low to mid-frequency band; examples include radio waves and microwaves (can induce thermal effects) and the visible light spectrum (excitation of electrons). Ionising radiation includes higher frequencies of ultraviolet light as well as x-rays and some gamma rays (can induce cell damage). In the context of RE infrastructure all electrical cables are capable of generating EMF (a moving electrical current creates a magnetic field perpendicular to the direction of the current flow, with the strength of that magnetic field decreasing rapidly with distance from the current). There are no external electrical fields associated with onshore underground cables as the produced field is contained within the metallic casing of the cable, however this does not shield from magnetic fields. The EMF generated by power lines falls within the extremely low frequency part of the electromagnetic spectrum; these frequencies can induce small electrical currents within the human body. The degree to which biologic effects become apparent is dependent on the strength of the current and the intensity of the magnetic field generated, and the main effect elicited is heating.

The World Health Organisation (WHO) reports that while high voltage transmission lines can induce currents, they are very small when compared to the levels which would be required to produce electrical shock; biological effects also do not always equate to biological hazard as higher energy levels are regulated at a national and international level. The WHO also notes that over 25000 articles have been published on the effects of non-ionising radiation and there is now good evidence to indicate that exposure to the low-frequency EMF generated by power lines is not considered to negatively affect health. The International Commission for Non-Ionising Radiation (ICNIR) produced guidelines in 2014 for exposure limits of the public and workers to electrical and magnetic fields. The guidelines highlight that only exposure to very strong direct current (DC) EMF causes significant biological effects (e.g. enough to affect pacemakers). The 2010 guidelines note that the exposure limit for the general public to static magnetic fields are 0.4 tesla; this is compared to occupational exposure limits which rise to 2 tesla for the head/body and 8 tesla for limbs in controlled environments. The guidelines further note that all exposures to intense fields occur only in occupational settings.

There are concerns however about the effects of long-term low-level exposure on health and general well-being. Symptoms are often reported to have been triggered by EMF exposure (e.g. headache, nausea and depression) however experiments have yet to tie such symptoms with EMF as these are often triggered by other common environmental sources (e.g. chronic exposure to noise). Some studies suggest a weak link between exposure to magnetic EMF and childhood leukaemia. However it remains unclear whether there is a cause and effect relationship as no one epidemiological study has proven conclusive, and some studies find no effect at all; additionally no biologically accepted mechanism has been proposed to explain this EMF sensitivity. Nevertheless, the International Agency for Research on Cancer classes EMF as “possibly carcinogenic to humans” due to the inconclusiveness of studies and the limited evidence for carcinogenicity.

Climate Change, Flooding and Human Health

The potential impacts of climate change on human health can materialise in a number of ways. Direct impacts can result from prolonged periods of hot or cold weather which can lead to heat and cold stresses and their associated effects. Milder winters may lead to lower fuel consumption and few cold related deaths and higher summer temperatures may lead to more heat stress related cases. Severe icy/flood conditions can affect the provision of critical, emergency and/or transport services. Indirect effects on human health may also increase as a result of the effects of extreme weather events on other environmental parameters, for example water quality, which are addressed under the respective sections of this chapter.

Climate change poses a number of significant hazards to society and the environment. Unless early action is taken to identify, understand and begin to deal with them, it may be too late to choose the way in which to adapt to climate change.

Climate change may also bring opportunities for cost savings, may allow new businesses to emerge (including renewable energy related businesses) or may make possible new ways to foster environmental sustainability. Those who have adapted to change in the most far-sighted and cost-effective manner will enjoy a competitive advantage over those who have failed to act. We are unlikely ever to be totally insulated from the effects of the climate we live in, and nor would we necessarily want to be. But we do need to take steps now to ensure that we are as resilient as possible to potential future climate changes and, in so doing, to make ourselves better able to cope with climate change in the present.

The Natural Environment, Human Health and Quality of Life

Our natural environment provides us with the essential services that we need for life, including air, water and food. Any deterioration in the quality of these elements can impact on our health and quality of life, and ultimately on our life expectancy. Exposure to the natural environment can have significant positive benefits to our well-being. Experiencing and connecting with nature through the many resources available, from town parks to national parks and everything in between. The experiences gained from it stimulate senses and emotions which contribute to an overall sense of well-being. The protection, management and accessibility of our natural environment therefore has to be a central component in the future planning for a healthy population. The COVID-19 outbreak has awakened a stronger appreciation of our connectedness to the environment on a local scale (within 5km of where we live). Media reports over this year (2020-2021) of confinement contain many examples of young and old re-engaging with their environment, enhancing their appreciation for nature and benefitting from access to it. Research undertaken for the Environmental Protection Agency (EPA) demonstrated that, among the citizens surveyed, the previously stated barriers to engaging with their local environment (lack of time from being at work, busy at home and poor weather) diminished in importance during the first half of 2020 (Kindermann *et al.*, 2020). The results of this survey also noted increases in early 2020 relative to 2019 of between 30 per cent and 45 per cent in the time spent in blue and green spaces for physical and mental health, with nearly half of the respondents reporting discovering new, or rediscovered old, green and blue spaces in their community.

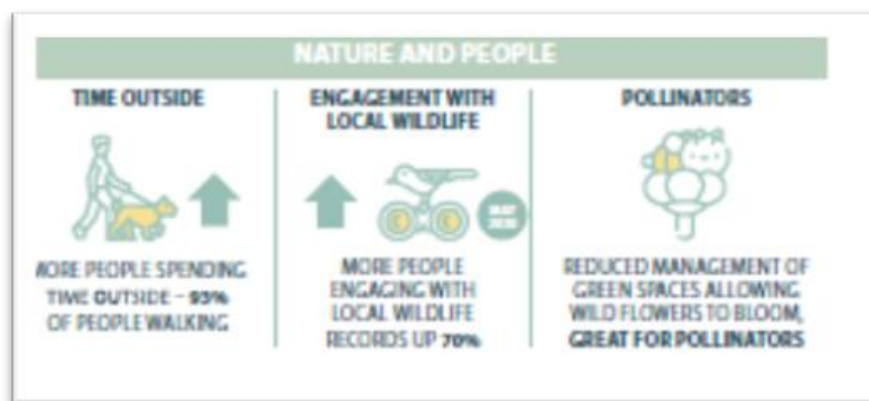


Figure 5.7-10: Extract from Ireland in the Pandemic – Environmental Indicators (Source: O’Leary, *et al.*, 2020)

5.7.8 Issues and Threats

The County of Clare has experienced ever increasing development pressures, but a changing economic climate due to the global world pandemic, the move to net zero carbon emissions and the requirement to decarbonise our very fabric of life is going to change the way we live, work and recreate. This in turn presents challenges for the future in relation to the provision of housing in rural areas as remote working becomes part of the norm. The trend over the past number of planning cycles has been towards outward movement from the Plan area in pursuit of employment. We now have a real opportunity to retain the younger age cohorts within the area and encourage those who

work within the area to also live within it and to encourage additional employment opportunities within the Plan area.

The population of Ennis (including Clarecastle) increased by 2.26% between 2011-2016 and compared with other Hub towns it has seen one of the lowest increases. Of concern is the significantly higher growth seen in the environs which has greater environmental implications. The unemployment rate in Clare stands at 12.4% (Census 2016). In order to avoid continued losses there must be a pro-active approach to encourage the existing population of the area to remain by providing employment opportunities, services and resources which will benefit the entire county.

Unemployment and retaining a young working population in County Clare is an existing pressure within the County. The unemployment rate in Clare stands at 12.4% (Census 2016). In order to avoid continued losses there must be a pro-active approach to encourage the existing population of the area to remain by providing employment opportunities, services and resources which will benefit the entire county. In addition there is an increasing rise in the elderly who will then have to be cared for into the future. There are existing pressures on the population in relation to the quality of insulation within homes and the increasing costs to heat homes.

There is a need to provide sustainable alternative employment options for the people of Clare. County Clare is ideally placed to provide long term sustainable employment which will address the requirement to achieve net zero emissions by 2050. These opportunities are already in train with the announcement in April 2021 of ESB's plans in conjunction with Equinor to progress 2 Offshore Floating Windfarms together with a Green Hydrogen Hub at its current coal fired station at Moneypoint.

Additional pressure comes from development and the need to ensure that there is sufficient capacity in terms of infrastructure and services to cater for increased population and proposed development into the future. In particular, adequate and appropriate energy supplies, wastewater treatment, water supply, surface and storm water drainage, transport (including provision for walking and cycling), waste management, community services and amenities, etc. will need to be planned and phased to address any current problems or deficits and to reflect any changes in population. There are also pollution issues in relation to individual wastewater treatment units and septic tanks which if not properly managed can cause contamination of surface water and groundwater.

Typical Pressures in Relation to RE Development on Population and Human Health include:

- Proximity of dwellings to RE infrastructure (e.g., wind turbines) and historic pattern of dispersed settlements/one-off housing;
- Noise relating to construction activities and arising from of RE infrastructure (e.g., turbines);
- Shadow flicker from turbines, lighting of projects;
- Impacts from construction activities (dust, noise, etc.); and
- Potential concerns over electromagnetic radiation arising from increased grid infrastructure or cabling requirements.

5.7.9 Data Gaps/Difficulties

Human health data for the RES area is not easily available. However, impacts on human health and quality of life may be derived from any of the environmental parameters. Ultimately, all of the effects of a development on the environment impinge upon human beings and their quality of life, both positively and negatively. Direct effects relate to matters such as water and air quality, noise, and landscape change. Indirect effects relate to such matters as flora and fauna. Accordingly, the topic of human beings and their quality of life are addressed in this Environmental Report by means of an appraisal of the indirect effects of the RES on the other environment parameters, of which human beings and their quality of life are an integral part. Where appropriate, mitigation measures to reduce/avoid adverse impacts are identified and incorporated into this Report and the RES under the other environmental parameters.

5.7.10 Evolution of the Environment in the Absence of the RES

In the absence of the draft RES there would be pressure on the environment from renewable energy development that may be located in unsustainable areas having potential impacts on sensitive human

and natural receptor. However, considerable environmental protection would remain due to the implementation of the Clare County Development Plan 2023-2029 and its policies and objectives relating to the population and human health.

5.8 Land and Soils (LS)

5.8.1 Introduction

This section presents soils and geology which is defined as ‘all natural materials underlying a development, from the ground surface to an appropriate depth underground’. This includes bedrock, subsoils, topsoils and geological features such as karst, peat sequences and areas of geological interest.

The Intergovernmental Panel on Climate Change (IPCC) deals with mitigation of climate change through Working Group III,³¹ which has concluded that land use, including agriculture and forestry, plays a central role for food security and sustainable development. The IPCC is currently preparing the Sixth Assessment Report (AR6) which was scheduled to be finalised in 2021.

Infrastructure (including housing), agriculture and forestry all compete for land and Ireland faces the challenge of availability of land in light of policies to increase afforestation and agricultural production alongside expansion of housing and infrastructure for a growing population.

Given the strategic nature of the Clare RES, focus of the baseline for soils and geology is at a County level and the key issues relate to:

- Balancing competing land uses with regional growth;
- Quarrying and extraction of mineral resources;
- Intended and unintended land use change;
- Inappropriate agricultural and forestry activities;
- Loss of prime agricultural land for development;
- Erosion of soils;
- Long-term strategy for the transition from peat extraction towards a natural asset-based rural economy;
- Spread of invasive species;
- Soil pollution;
- Effects on geomorphology (i.e. landforms and river channels);
- Sealing of soils; and
- Increase in extent of built up areas/ urbanisation.

The potential for disturbance of soils during infrastructural development can lead to the loss of soils along with compaction of soils due to operations of heavy machinery. Loss of soils and sediment to water courses can lead to sediment issues such as an increase in suspended solids, which can impact on water quality.

5.8.2 Soils

Soil is a valuable resource that performs many ecosystem services: production of food; production of biomass; storage, filtration and transformation of nutrients and water; carbon storage and cycling; and contributes to the landscape and cultural environment. Such functions of soil are worthy of protection because of their socio-economic as well as environmental importance. Soils in any area are the

³¹ Agriculture, Forestry and Other Landuse (AFOLU): Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

result of the interaction of various factors, such as parent material, climate, vegetation and human action.

The quality of soils in Ireland is considered generally good although there are pressures impacting on its long-term protection and maintenance particularly from land use/ land cover changes, intensification of use and urbanisation. In Ireland, some soil protection legislation has been enacted including the 2011 EIA Regulations for On Farm Development which includes a requirement for EIA of soil operations such as soil drainage and screening by the Department of Agriculture, Food and the Marine is required where drainage works exceed 15 hectares.

National Soils and subsoils maps were created by the Spatial Analysis Unit, Teagasc established in 1998. The project was completed in May 2006 and was a collaboration between Teagasc, Geological Survey of Ireland (GSI), Irish Forest Service (IFS) and the EPA. The most recent soil map, which is was a progression from the original national soil survey, was published in 2014 as part of the Irish Soils Information System (SIS) which was cofounded by the EPA and Teagasc in 2008. The SIS project built on the original county surveys and involved extensive sampling to obtain field data for counties not previously covered by the National Soil Survey. The overall objective of the project was to produce soil map of Ireland at a scale of 1:250,000 with an associated web-based soil information system in the public domain.

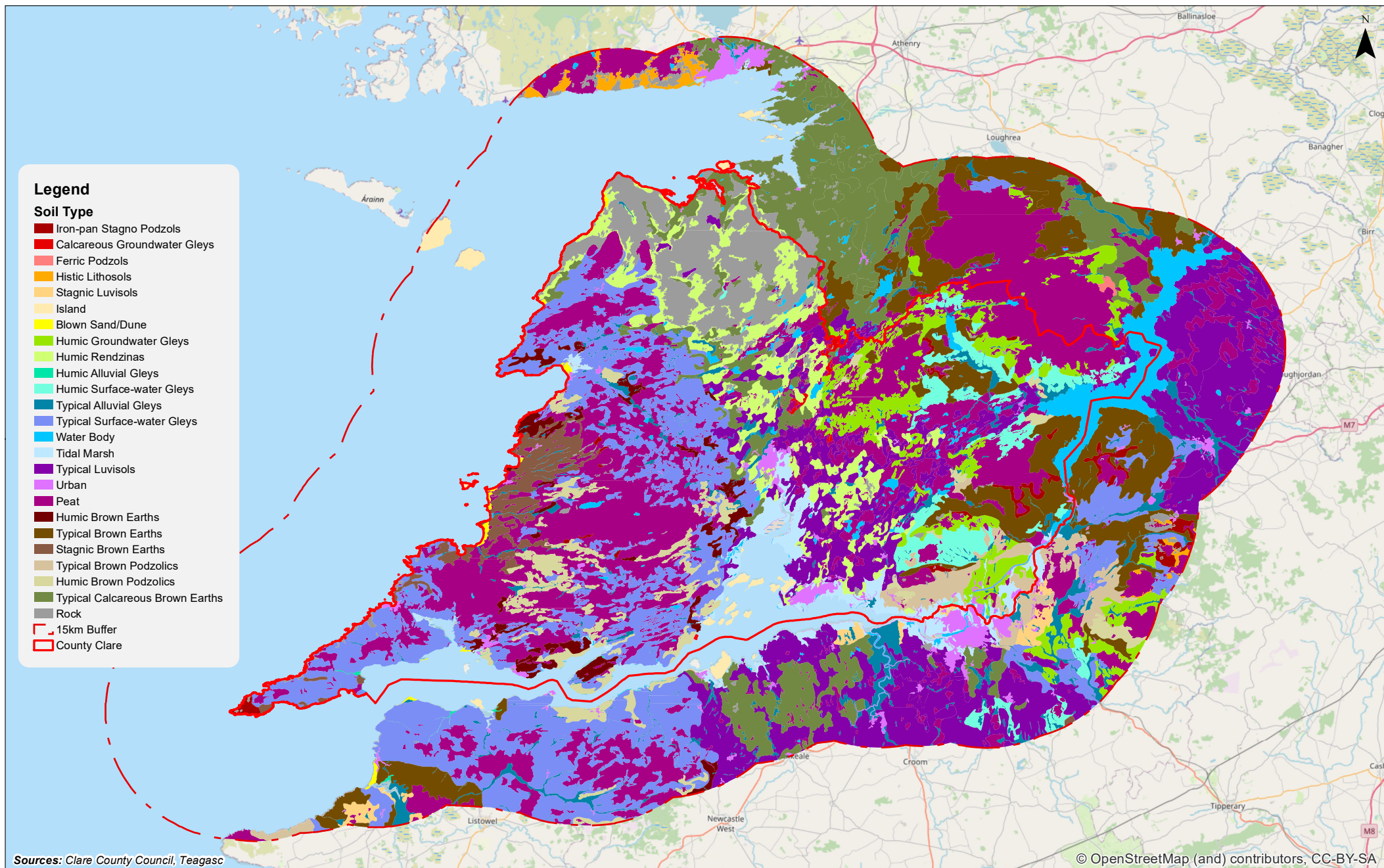
The IFS soil database has seven classes of soil groups which describe the hydrological properties of the soil types: Deep, well-drained mineral, Shallow well-drained mineral, Deep Poorly drained mineral, Shallow Poorly drained mineral, Poorly drained mineral soils with peaty topsoil, Alluvia, Peats and Miscellaneous. All soil types belong to one of the 11 Great Soil Groups. The soils map for Clare, **Figure 5.8-1**, illustrates the distribution of soil types within County Clare and the general properties of the main soil groups found are set out in **Table 5.8.1**.

Table 5.8.1: Soil Groups in Co. Clare

Soil Description	Code	Included Soil Group	Characteristics
Deep Well Drained Mineral			
Derived from mainly non- calcareous parent materials	AminDW	Acid Brown Earths,	Most occur on lime deficient parent materials, therefore acidic in nature, relatively mature and well drained.
		Brown Podzolics	Good physical characteristics
Derived from mainly calcareous parent materials	BminDW	Grey brown podzolics,	Usually formed from calcareous parent material which counteracts the effects of leaching, can be light to heavy textured
		Brown Earths (medium-high base status)	Most occur on lime-deficient parent materials, therefore acidic in nature, relatively mature and well drained
Shallow Well Drained Mineral			
Derived from mainly non-calcareous parent materials	AminSW	Lithosols	Skeletal stony soils usually overlying solid or shattered bedrock, use limited to rough grazing and forestry.
		Regosols	Present at Seafield, unconsolidated soil with a high pH and exposure to Atlantic Winds
Derived from mainly calcareous parent materials	BminSW	Rendzinas	Shallow soils, usually no more than 50cm depth, usually derived from limestone parent material, use limited by shallow depth
		Lithosols	Skeletal stony soils usually overlying solid or shattered bedrock, use limited to rough grazing and forestry, formed directly from calcareous bedrock
Deep Poorly Drained Mineral			
Derived from mainly non- calcareous parent materials	AminPD	Surface water Gleys, Groundwater Gleys	Developed under the influence of permanent or intermittent waterlogging, impervious with poor

Soil Description	Code	Included Soil Group	Characteristics
			physical structure, unsuitable for cultivation or intensive grazing
Derived from mainly calcareous parent materials	BminPD	Rendzinas	Shallow soils, usually no more than 50cm depth, usually derived from limestone parent material, use limited by shallow depth
		Lithosols	Skeletal stony soils usually overlying solid or shattered bedrock, use limited to rough grazing and forestry, formed directly from calcareous bedrock
Shallow Poorly Drained Mineral			
Derived from mainly calcareous parent materials	BminSP	Surface water Gleys, Groundwater Gleys	Soils which have developed under water-logging conditions. Where the gley results from a high water table the soil is referred to as a groundwater gley.
Peaty Poorly Drained Mineral			
Derived from mainly non-calcareous parent materials	AminPDTP	Peaty Gleys	Gleys with significant peat development on the surface
Shallow, Rocky, Peaty/Non-Peaty Mineral Complexes			
Derived from non-calcareous rock or gravels with/without peaty surface horizon	AminSPRT	Podzols (peaty), Lithosols, Peats	Podzols develop at higher elevations, generally poor degraded soils.

Source: Spatial Analysis Group, Teagasc, EPA Soil and Subsoil Mapping Project, 2006

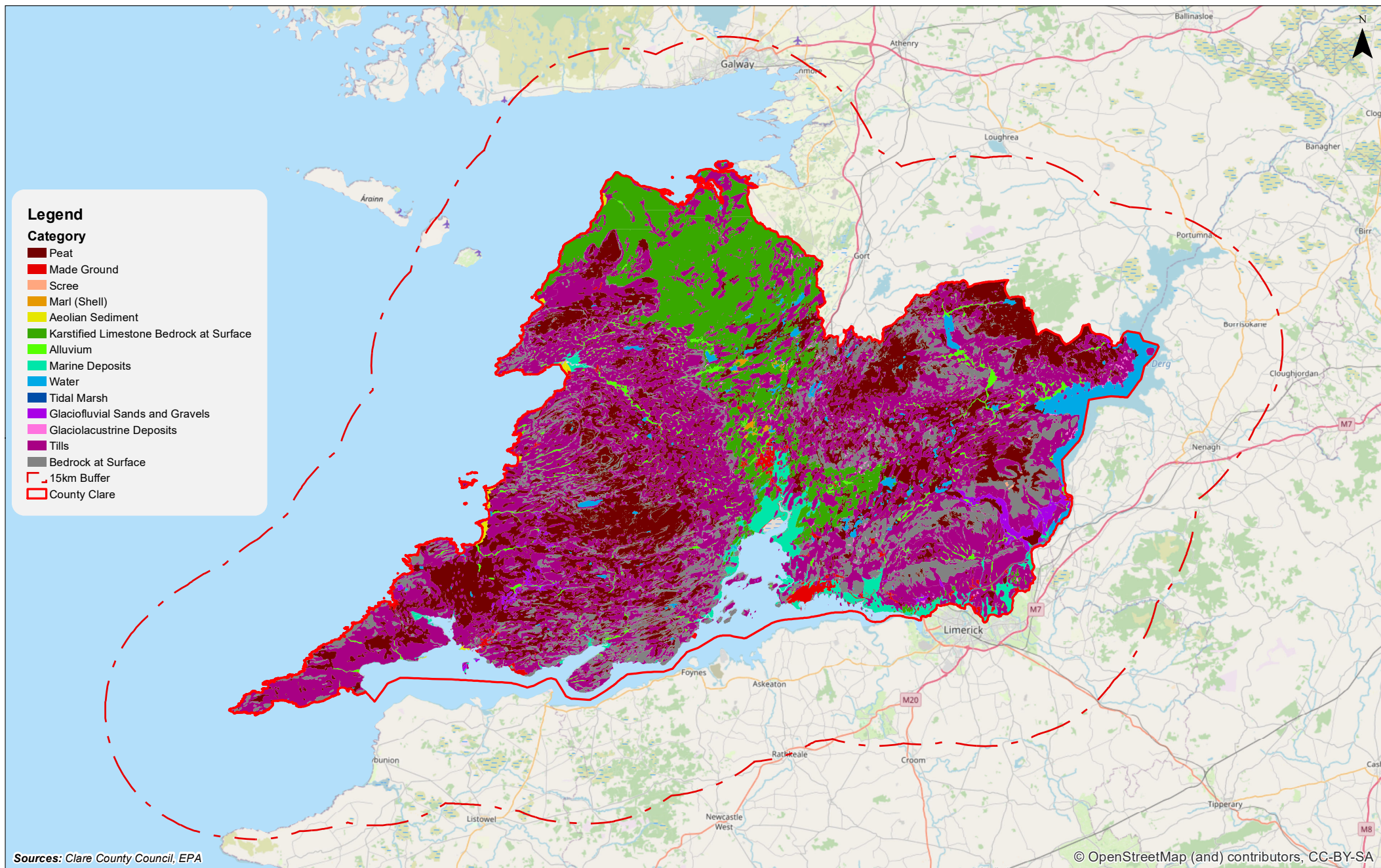


The subsoil parent material is that from which the subsoil is ultimately derived; the character of the underlying bedrock and also the influence of the development of subsoil. Subsoils for the majority of the County are outlined in **Table 5.8.2**. The distribution of subsoil in Clare is shown in **Figure 5.8-2** “Main Sub Soils” and summarised in **Table 5.8.2**. The GSI have also mapped subsoil permeability from low to moderate to high and this data is available to view on the GSI’s online spatial resources viewer.

Table 5.8.2: Parent Material Characteristics of the Main Subsoils in the Plan Area

Subsoil Parent Material	Description
Alluvium	Undifferentiated sediments – usually by watercourses. Marl sediments also present in the north of the plan area.
Peat	Fen peats mainly in the east of the plan area. Blanket peat widespread over the western part of the County.
Sands and Gravels	Subsoils derived variously from Lower-Palaeozoic to Carboniferous shales, sandstones, limestones and granites
Scree	Collections of broken rock fragments usually found at the bases of hills and mountains
Tills	Limestone tills throughout and also some sandstone derived tills in the north of the plan area.
Gravels	Deposits of gravels derived from Namurian sandstones and shales are present at the south of the County.
Karst Rock – in some cases the rock can be at or near the surface	Limestone bedrock is throughout the plan area with several limestone bedrock formations present with varying degrees of karstification. In many areas there are shallow soils with bedrock at or near the surface.
Aeolian Sediments	Wind-blown sediments including sand and dunes
Lacustrine Sediments	Comprised of undifferentiated lake sediments
Marine Deposits	Material derived from marine and estuary clays, silts, sands, gravels and marls.
Urban	Made-up ground of an artificial nature. Predominantly at the centre of the plan area at Ennis and denotes development areas.

Source: Geological Survey of Ireland, Quaternary Geology Mapping



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5.8.3 Soil and Climate Change

Significant changes to soil condition can be brought about by the impacts of climate change including changes in air temperature, precipitation and extreme weather events - increased occurrence of summer droughts and increased winter rainfall. The potential impacts of these weather changes are likely to be experienced most significantly in relation to agriculture, peatland areas and forestry areas as well as increasing the potential for flood risk.

In addition to potential effects on soil condition, dryer summers (likely to be experienced more in the east of the country) would require irrigation of crops during summer months thus requiring necessary infrastructural investment to store winter rain. The drying out of soils in response to climate change could result in deterioration of soil quality and soil moisture levels. In wetter western areas, within which the Plan area lies, increased rainfall could cause increased soil erosion. Generally, a combination of dry summers and wet winters could also result in subsidence and soil heave.

Soil comprises for the most part of organic matter, minerals and fine to coarse grained weathered rock. The variability of the constituent parts and the percentage content of each in the soil matrix results in differing characteristics. Soil is a complex mixture of weathered minerals, living organisms, organic matter in various stages of decomposition, gases and water. Numerous natural factors influence the composition of soils, notably bedrock, climate and topography.

Soils have a number of functions including supporting plant life and life within the soil, biogeochemical cycling of elements, energy cycles, water storage and exchange and ecosystem productivity. Soil formation occurs over very long timescales and can be considered a non-renewable resource.

Bogs and Peatlands: The Irish climate is conducive to the widespread development of bogs of different types ranging from the blanket bogs in the west to the raised bogs in the midlands. The biodiversity supported by the different bog types varies considerably and, in many cases, make them unique within Europe. Active bogs play an important role in combating climate change by removing excess carbon dioxide from the air and placing it into long term storage for thousands of years. Bogs also provide other ecosystem services, such as attenuation of flooding.

The National Peatlands Strategy, 2015-2025, is the national plan responsible for management and conservation of peatland following changes in management of land following large scale erosion in blanket and raised bogs in Ireland. Currently feedback is being sought for the mid-term review of the strategy to refocus it in line with its overall goals and the current context.

Bord na Móna is the semi-state company with the aim of developing peatland for economic use, including electricity generation, for which peat remains part of the fuel mix in Ireland. In Ireland as a whole, one power plant currently fires 100% peat – the Bord na Móna power plant at Edenderry (Co. Offaly). The last peat burning ESB power station at Lough Ree ceased production in December 2020. The government subsidy for peat burning Edenderry ended in 2016. The government has since introduced a new subsidy which will allow the continued burning of peat alongside the co-firing of at least 30% wood biomass.

Section 5.6.12 discusses the management of raised bogs under the National Raised Bog SAC Management Plan 2017-2022 and the identifies the raised bogs designated as NHA's and SAC's within County Clare.

5.8.4 Geology

The bedrock geology of County Clare is shown in **Figure 5.8-3**. The western area of County Clare consists of Namurian sandstone and shale which are sedimentary rocks. Marine shelf facies stretches from the north of Clare, through the centre of the county, down to the southern centre of the county and also into the east – the last glaciation event carved into these deposits which now form the limestone pavements making up the Burren landscape. The south of Clare also contains three small areas of Waulsortian mudbank deposits.

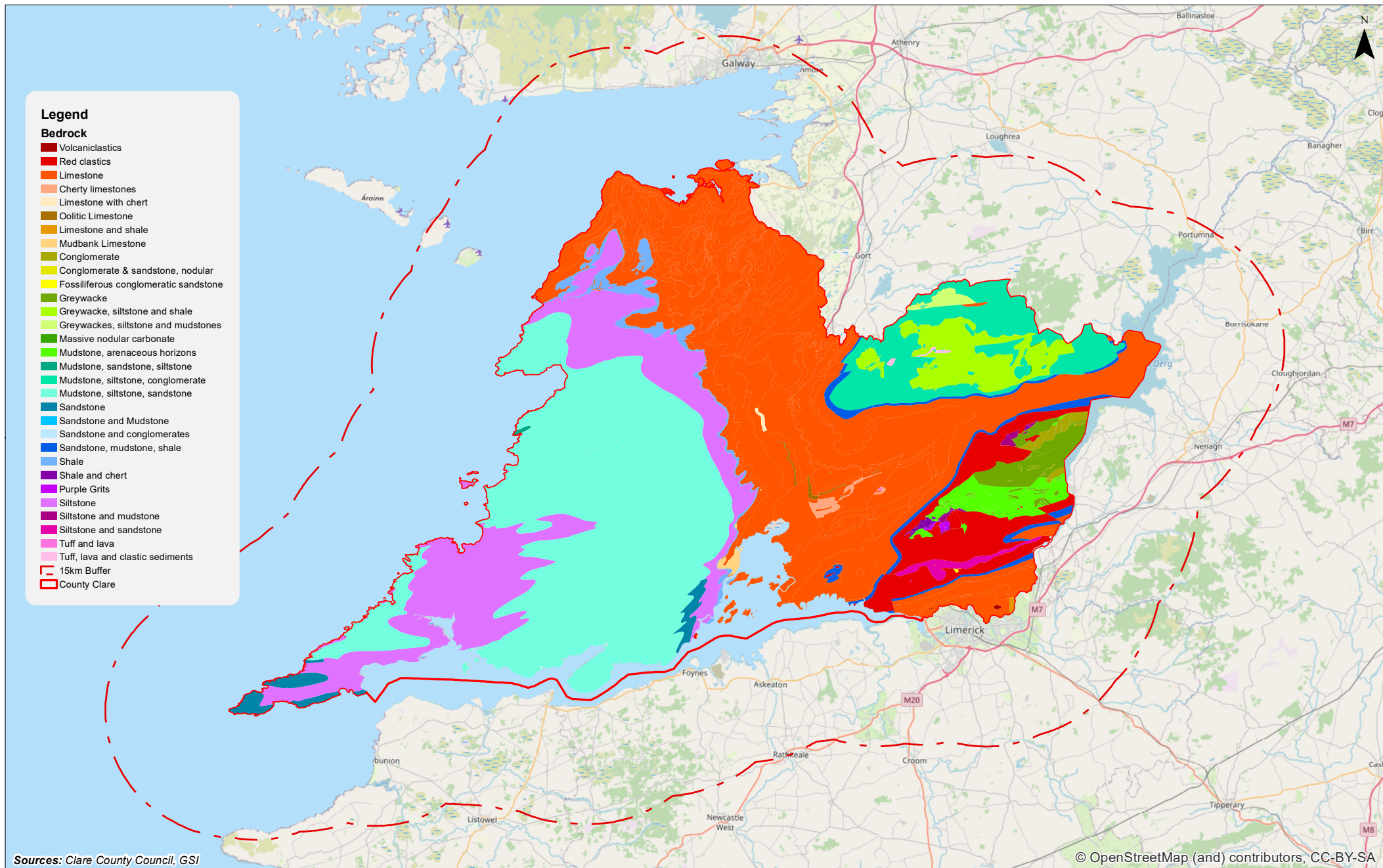
The east of the county consists of three corridors and four small areas of Waulsortian mudbank. In addition, there are two patches of marine shelf facies, two corridors and six patches of Courcayan limestone, two large and two small areas of Upper Devonian to Lower Carboniferous Old Red Sandstone, five areas of Silurian sandstone/greywacke/ shale, two small areas of Mid to Upper Ordovician acid volcanics, two small areas of marine shelf facies, two small areas of Mid to Upper

Ordovician slate, one small area of Carboniferous volcanics and minor intrusions and three corridors and three small areas of lower limestone shale.

The rocks in general decrease in age from west to east – early Ordovician volcanic activity was followed by Silurian marine sediment deposition in the west, followed by deposition of sandstones during the Devonian when sea levels dropped. Extensive deepwater limestones were deposited during the Carboniferous mostly to the north and centre of County Clare, which today forms the limestone pavements and karstic features of the Burren landscape. This limestone deposition was followed by gradation to shallower seas with the west of Clare characterised by river and delta deposits during the latter part of the Carboniferous.

Geological Heritage: The Geological heritage county audit for Co. Clare was completed in 2005. There are 45 sites of geological importance within County Clare, which include cave systems, limestone pavements and mushroom stones. The Geological Survey of Ireland (GSI) has identified some of these areas as County Geological Sites (CGS-surveyed and audited sites) as part of their Irish Geological Heritage Programme and this data is available to view on the GSI's online spatial resources viewer.

There are also areas of geological heritage interest in Co. Clare that have not yet been surveyed- therefore their location is approximate and the GSI have a buffer has been applied to each (unaudited sites). The Geological Sites which have been identified in County Clare are illustrated in **Figure 5.8-4**. The Irish Geological Heritage Programme identifies and selects the most significant CGS which will be recommended for designation as NHAs in the future.



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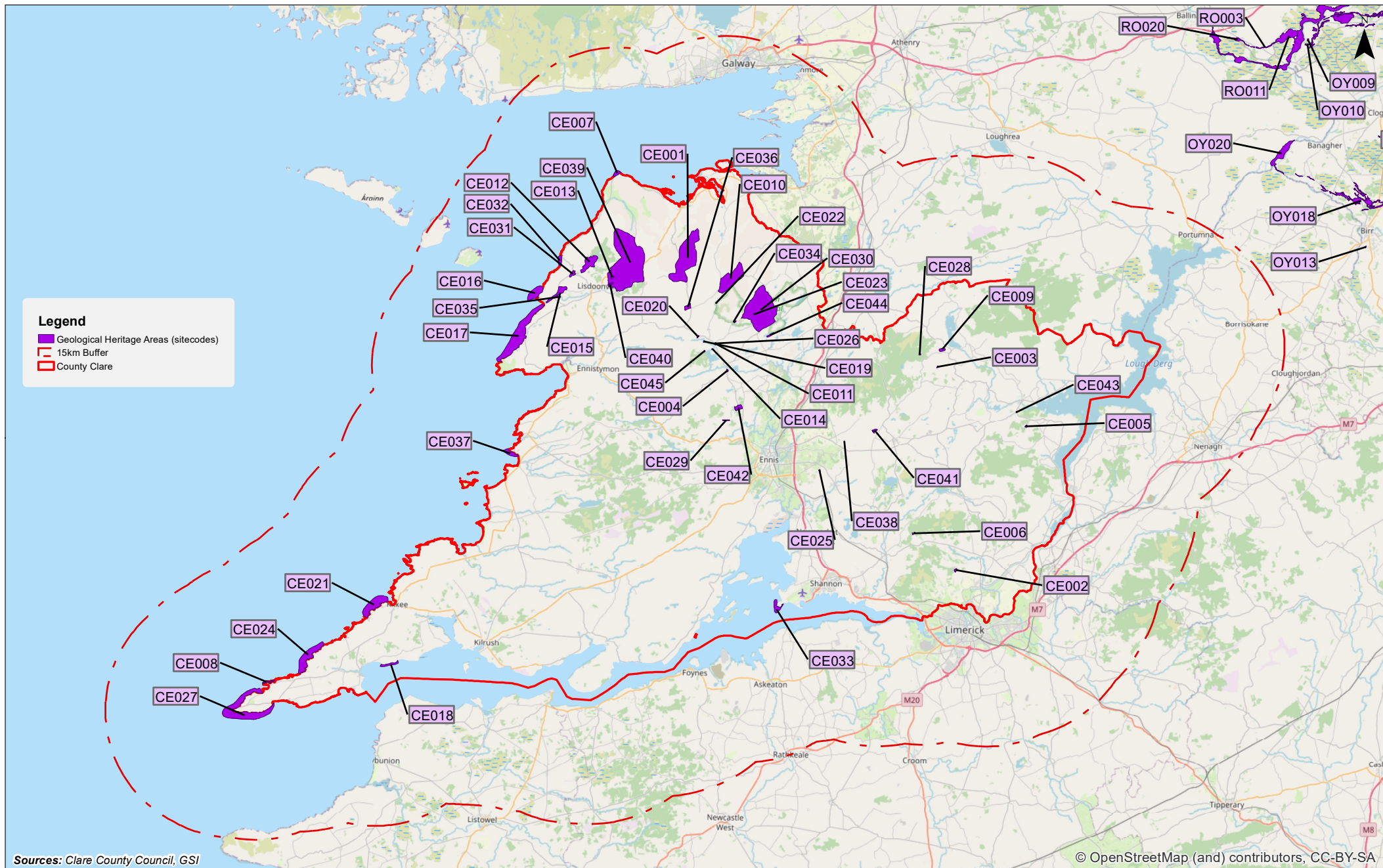
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Clare County Council

Figure 5.8.3 Bedrock Geology of County Clare





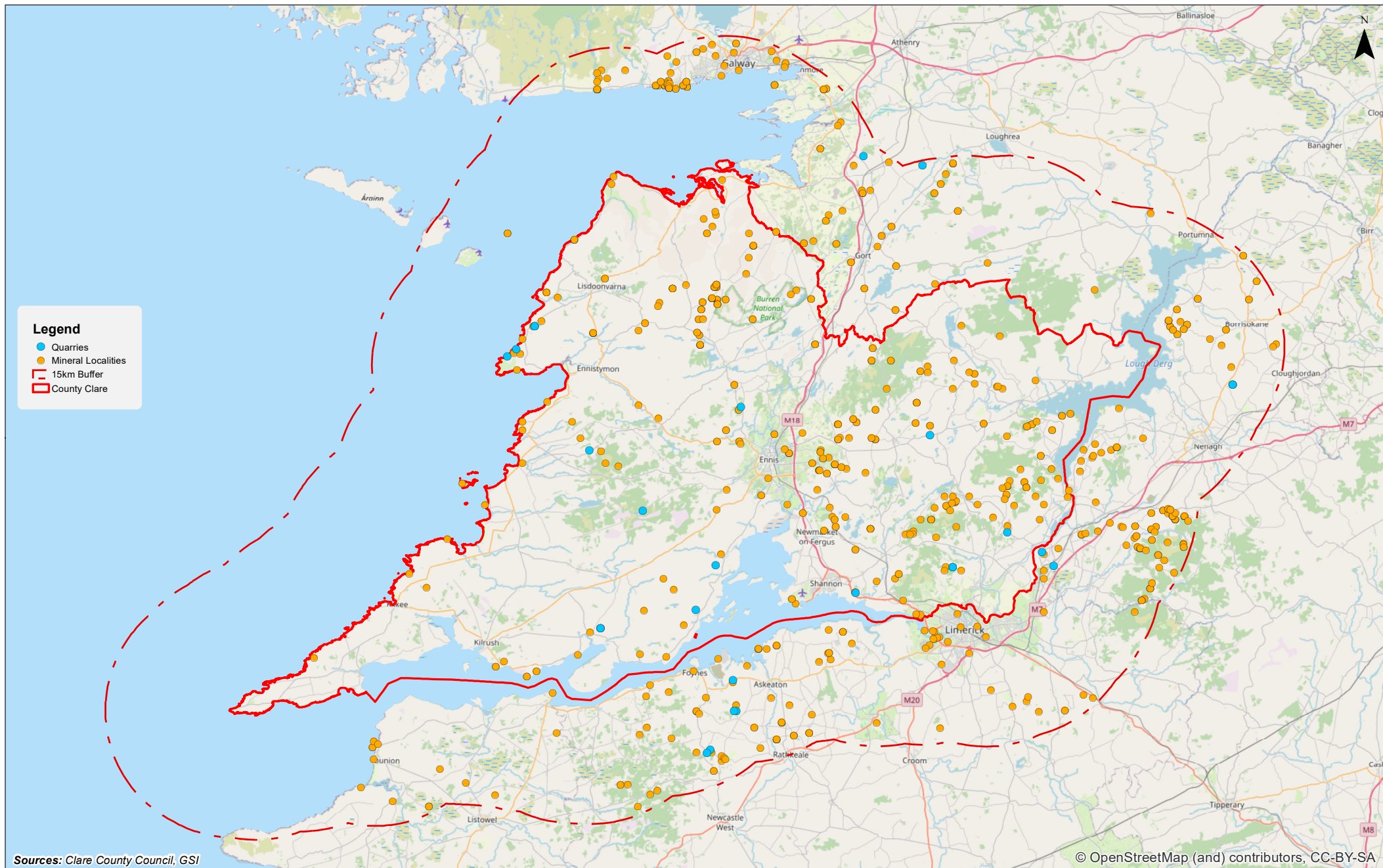
5.8.5 Quarrying, Minerals & Aggregates

There are reasonable reserves of extractable natural resources within County Clare, particularly limestone rock. Section 261 of the Planning and Development Act 2000 (as amended) provides for the registration and control of quarries. The Quarry and Ancillary Activity Guidelines for Planning Authorities 2004 (Department of the Environment, Heritage and Local Government) is a useful guide when assessing applications for quarry developments.

According to the Extractive Industries Register maintained by the EPA under the Waste Management (Management of Waste from the Extractive Industries) Regulations 2009 (S.I. No. 56 of 2009), there are 205 extractive industries in the County (including quarrying, commercial peat extraction and timber production). The GSI's online spatial resources viewer indicates that 13 quarries were reported as active in County Clare.

Unlike most other forms of development, minerals can only be worked where they are found. This means that the spatial distribution of mineral resources and thus the potential for workings is dictated by geological considerations and not by the demands of human geography. The GSI Minerals Section began a programme of mapping of "Aggregate Potential" on a county-by-county basis. This data is available to view on the GSI's online spatial resources viewer. The data is available nationwide and covers crushed rock aggregate potential as well as granular potential. The data indicates that there is high to very high crushed rock aggregate potential across Mid Clare and in the vicinity of Ennis. There is a smaller amount of granular rock aggregate potential, with very high potential concentrated in the Cooraclare region of southwest Clare.

Figure 5.8-5 illustrates the distribution of active quarries and mineral localities in the County.



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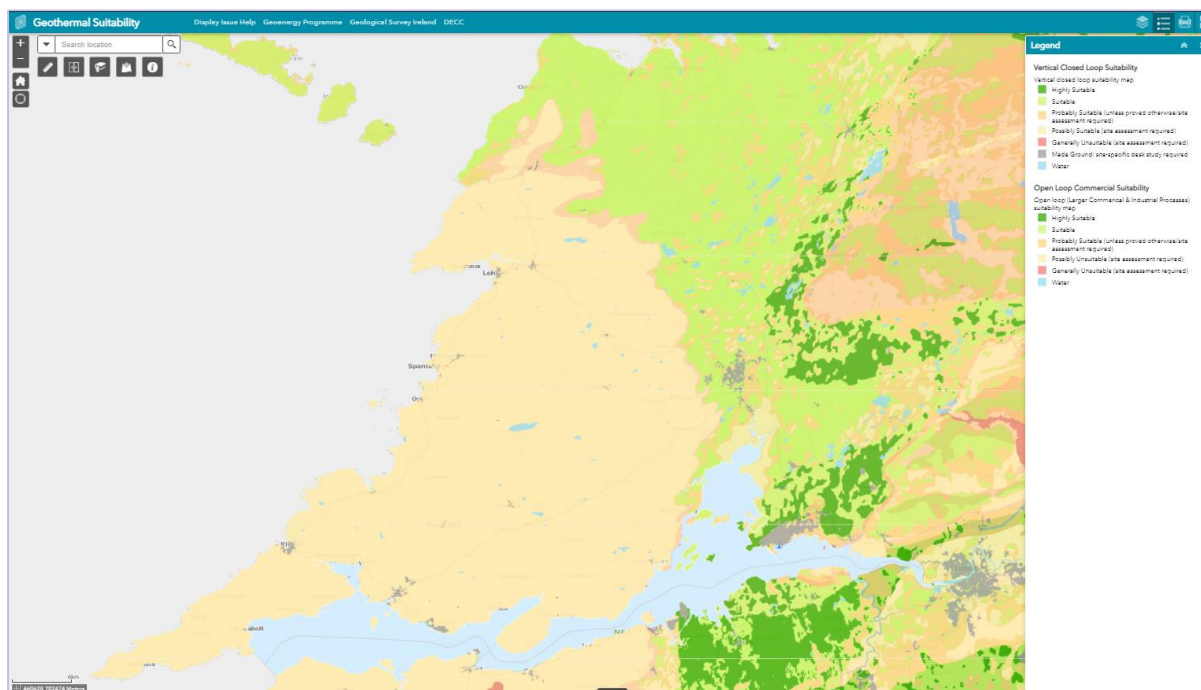
Clare County
Council

Figure 5.8-5 Quarries & Mineral Localities within County Clare



Geothermal Energy: The Geological Society of Ireland (GSI) have produced a national shallow geothermal energy resource map which enables informed decision making and preliminary site suitability assessments. The map and database was developed to meet the limited national, geological information relating to geothermal energy. The mapping indicates that the northeast of the County is suitable for vertical closed loop geothermal technology and open loop commercial technology (see Figure 5.8-6).

Figure 5.8-6: Geothermal Suitability within County Clare



Source: GSI Geothermal Suitability Viewer

<https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>

5.8.6 Geohazards

Landslides: Ireland is fortunate not to be a high-risk area for landslides, though landslides do occur, however infrequently, with the most occurrences in coastal, upland and peat bog areas. Though the potential for major destructive landslides is slight, there have been instances of severe events in Ireland in the past. As of early 2021, the GSI has recorded 1,907 landslide events in nationally, of which 726 have been verified. Within County Clare 7 landslide events have been recorded.

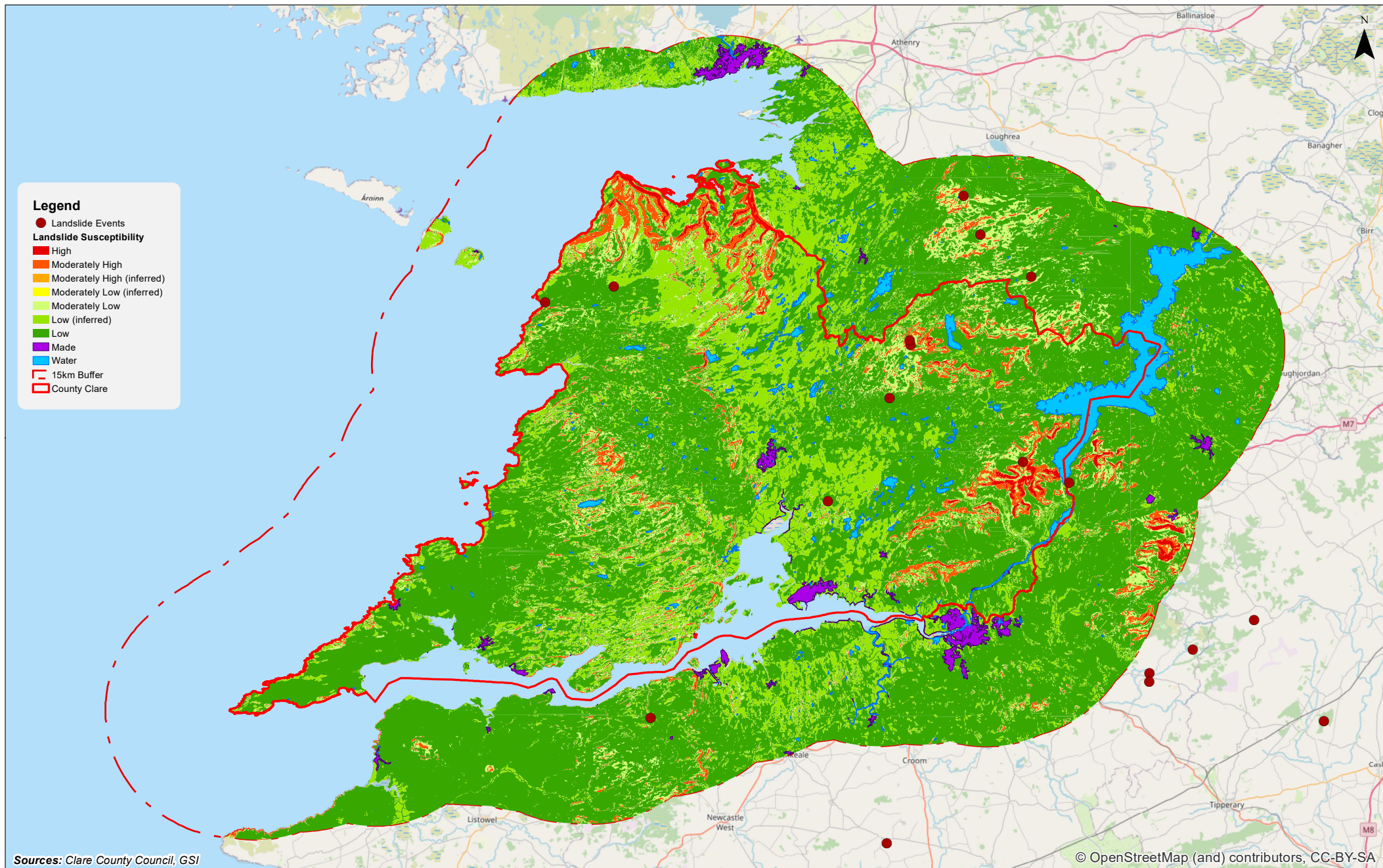
The GSI Irish Landslides Working Group (ILWG) has also compiled a landslide susceptibility database in order to assess the scale of the landslide problem historically and also to assess the susceptibility of areas to landslide hazard in the future. This has direct relevance to the sustainable development of the landscape in terms of housing, infrastructure etc. and is therefore an important issue for the planning process. This national landslide susceptibility mapping was completed between 2007- 2016. The majority of the County is classed as having 'Low' landslide susceptibility. The data indicates that risk increases to 'Moderately High' and 'High' in more uplands areas, notably Slieve Callan west of Ennis and Mahera to the west of Lough Graney. There are also areas of High susceptibility in the northern region such as at Gleninagh and Moneen Mountains.

The potential implications of climate change to impact on landslide risk (increased risk of slope instability as a result of changes in seasonal rainfall i.e. the occurrence of heavy rainfall) have been assessed as part of the EPA's Critical Infrastructure Vulnerability to Climate Change (CIViC) project³².

³² EPA Research programme 2021-2030: CIViC: Critical Infrastructure Vulnerability to Climate Change, Report No.369

The findings concluded that the risk from landslides is likely to increase for roads in the west of the country if no soil reinforcement techniques are put in place.

Figure 5.8-7 illustrates the landslide susceptibility and recorded landslide events within County Clare.



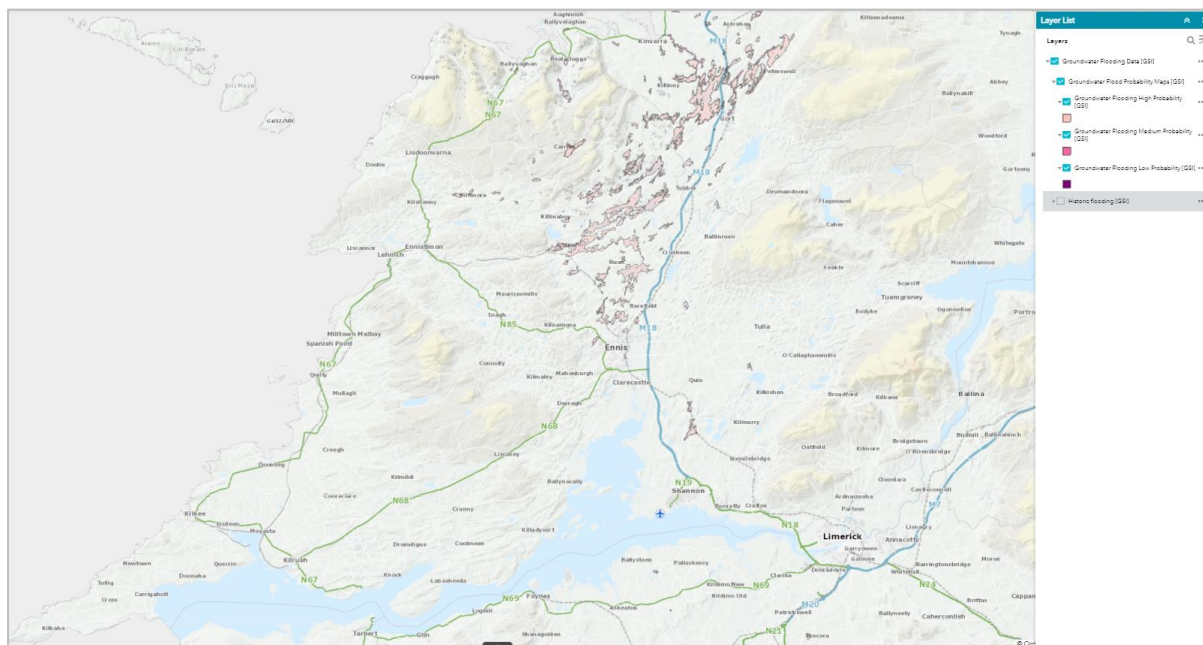
Groundwater Flooding: Groundwater flooding can also be a serious issue and occurs when the water table rises above the level of the land, which results from the natural subsurface drainage system being unable to drain away rainfall quickly enough. In Ireland, the most extensive form of groundwater flooding is related to prolonged rainfall causing water table rise in the limestone lowland areas in the west of the county. Following the most significant groundwater flooding event to have occurred in Ireland over the winter of 2015/2016, the GSI in collaboration with Trinity College Dublin and Carlow Institute of Technology undertook the GWFlood Project. It aims to help fill the data gaps around understanding the issue of groundwater flooding with the outputs being a project report plus a national data viewer showing historic and predictive groundwater flood maps, as well as live groundwater hydrometric data. The GSI's Groundwater Flooding Data Viewer shows the probabilistic flood extent of groundwater flooding in limestone regions.

The Groundwater Flood Probability Maps show a High Probability of Groundwater Flooding at the north of the County within the limestone pavements making up the Burren landscape and in the vicinity of Dromore Woods and Lough (see **Figure 5.8-8**).

Coastal Vulnerability: The Marine and Coastal Unit of the GSI participates in coastal vulnerability mapping and coastal erosion mapping as part their CHERISH programme (Climate, Heritage and Environments of Reefs, Islands and Headlands). To date the Clare coast has not yet been mapped as part of the Coastal Vulnerability Index initiative which at present provides maps from north Co. Louth to Co. Wexford.

INFOMAR, Ireland's national marine mapping programme, which is jointly managed by the GSI and the Marine Institute, provides key baseline data for Ireland's marine sector. Geohazards such as shipwrecks and underwater canyons and cliffs are mapped. One shipwreck is identified approx. 2.5km southwest off shore from the Clare coast at Doonaha. Sub-bottom profile coverage is available to download from the coast of Lisdoonvarna southwards to Kildysart. Sediment classification is also available with the marine sediment environment off the County Clare coast comprising mud to muddy sand at the north, sand and coarse sediment off the mid Clare coast and rock, sand and mixed sediment off the south Clare coast.

Figure 5.8-8: Groundwater Flooding Probability



Source: GSI Groundwater Flooding Data Viewer
<https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=848f83c85799436b808652f9c735b1cc>

5.8.7 Landfill

The landfill site at Doora is closed and no further waste activity is permitted on the site. It has been decommissioned and rehabilitated and is currently in recreational use. There is ongoing environmental monitoring at various locations throughout the site, a leachate tank for the collection of leachate runoff and a Flare for the burning off of gases that accumulate on site. There are no active landfill sites within the Plan area.

Landfilling at Ballydugff Beg, Inagh commenced in 2002 and ceased in 2011. At the end of 2020 consultants were appointed to develop the design for the capping of the landfill with the potential for works to commence in the summer of 2021. The site currently operates as a civic amenity site and as of 2020 accepted small quantities of municipal waste which is removed off site. A composting facility was developed in 2006. There is ongoing environmental monitoring for groundwater at various locations throughout the site.

5.8.8 Contaminated Sites

Currently there is no specific legislation addressing contaminated land in Ireland and to date numerous approaches to the problem, including the ad hoc application of standards and methodologies from other countries, have been applied. In contrast to the UK, historical industrial development within the Republic of Ireland has been restricted primarily to the main port cities. Therefore, land affected by contamination is less widespread and is related primarily to unregulated disposal of waste, agricultural practices and point source releases to ground from discrete sites.

There is no statutory definition of “Contaminated Land” within Ireland, and the term is generally used to refer to all land affected by land contamination. The issue of contamination is covered in a number of existing legislative acts, which are focused primarily on ensuring prevention of pollution from ongoing activities rather than driving clean up from historical use. To date, remedial action with respect to contaminated soils has been driven by the planning and development process and more recently by the requirement for local authorities to identify and assess unregulated waste disposal sites.

The principles of risk assessment, including the concept of the source-pathway-receptor linkage, have been adopted by the Environmental Protection Agency (EPA) for the assessment of Environmental Liabilities and Unregulated Waste Disposal Sites. However, there remains no formalised approach to the assessment of risks to human health from contaminated soils or groundwater.

In April 2007, the EPA published a Code of Practice that provides a framework for the identification of contaminated sites, the assessment of the potential risks associated with them and the identification of the appropriate remedial measures or corrective actions required to minimise risk to the environment and human health. Following the publication of the Code, the EPA trained local authority staff on its use and application. Local authorities are now implementing the Code and the EPA is overseeing its implementation; however, a list of contaminated sites is not centrally compiled. In 2013 a document titled ‘Guidance on the Management of Contaminated Land at EPA Licenced Sites’ was published. This guidance is a risk based approach considered best practice for the assessment and remediation of contaminated land and groundwater at EPA licensed sites.

Hazardous waste in Ireland is generated by all sectors (industry, households, farms etc.). The EPA’s Hazardous Waste Management Plan (2014-2020) sets out the priorities for managing hazardous waste. The latest data indicates that the overall quantity of hazardous waste increased in 2019 compared to 2018, mainly due to an increase in incinerator ash and contaminated soil.³³

Roche Ireland is an Industrial Emission (IE) licensed site which is scheduled to be demolished in June of 2021. Roche ceased onsite manufacturing activities in December 2019 and is planning to undertake site infrastructure demolition and remediation of specific areas of environmental concern (AEC) on the site, scheduled for the summer of 2021. The works will involve the demolition and

³³ EPA National Waste Statistics for Ireland: Key Trends, EPA Release 11th December 2020 [Accessed May 2021]: <https://www.epa.ie/nationalwastestatistics/hazardous/>

¹ EPA Annual Environmental Report, 2020: http://www.epa.ie/licences/lic_eDMS/090151b2807b1799.pdf

removal of most buildings, structures and infrastructure currently within the site boundary fencing and the remediation of the identified AECs to return a brownfield site for future appropriate use.¹

There are 4 contaminated sites in the County Clare which were compiled as part of the Shannon International River Basin Management Plan. In relation to these sites, action has progressed through the IPPC and Codes of Practice licensing systems (for contaminated lands and landfills respectively). These sites are owned by Heraeus Metal Processing Ltd., UCB Manufacturing Ireland Ltd (formerly Schwarz Pharma Ltd), Shannonside Building Supplies Ltd and Electricity Supply Board (at Moneypoint).

The EU also has directive regarding the control of major accident hazards, commonly known as the Seveso III Directive (2012/18/EC). This was adopted and ratified into Irish law through the Control of Major Accident Hazards Involving Dangerous Substances (COMAH) Regulations 2015 (S.I. No. 209 of 2015). The Directive aims to prevent major accident hazards involving dangerous substances and chemicals and the limitation of their consequences for people and the environment. In conjunction with the Health and Safety Authority (HSA), it is policy for local authorities to implement the provisions of the Seveso III Directive (2012/18/EU). Seveso sites are defined as industrial sites which, because of the presence of sufficient quantities of dangerous or hazardous substances, must be regulated under this EU directive. If there are planning applications for development occurring within a certain distance of the perimeter of a Seveso site, the HSA provides appropriate advice to the planning authorities in respect of development within a distance of these sites. Contaminated land requires appropriate remediation of the site prior to any development, ensuring there is no migration of contaminated material during remediation or measures to handle landfill gases. Seveso sites are categorised as Upper Tier or Lower Tier depending on the size of the site and the quantities of dangerous/hazardous material present. As of December 2020, the HSA lists that there are 50 Lower Tier Seveso sites and 49 Upper Tier Seveso sites in Ireland.³⁴ Of these 1 Lower Tier site is in County Clare; Eva Ireland in Shannon and there are 2 Upper Tier sites; the ESB power station at Moneypoint and the Shannon Airport Authority (the location of the Heraeus Metal Processing Ltd and UCB Manufacturing Ireland Ltd). However, the lack of heavy industry in Ireland means that Irish soils have not been subject of significant amounts of contamination; the ubiquity of permanent pasture affords a level of protection from soil degradation, with the exception of peatlands.³⁵

5.8.9 Issues and Threats in the Plan Area

Threats to soil and geology can materialise in the form of the actual loss or damage/disturbance of soil and bedrock. Soil loss occurs through the removal or compaction of soil during construction of developments, particularly on Greenfield sites. Soil disturbance through activities and practices associated with the supporting infrastructure for renewable energy projects such as access road construction, drainage works/dredging for new harbour facilities and cable laying etc, can result in a loss of vegetative cover thereby reducing soil stability that can lead to sediment run-off often into the aquatic environment. Dredging works in harbours have the potential to alter and/or geomorphological landforms.

Factors such as soil type, land slope and the degree of disturbance and indeed the quality and proper maintenance of effective measures used for the prevention of sediment run-off, can also produce an increased risk of nutrient run-off within the sediment itself.

The physical presence of sediment in an aquatic ecosystem can have damaging and even catastrophic effects to spawning beds and oxygen balancing regimes which are imperative for healthy fish populations, and other aquatic flora and fauna. Nutrients such as a phosphorus that is bound to soil, albeit sometimes poorly e.g. peat soils which are widespread over the western part of the County, becomes mobile through sedimentation which impacts the aquatic environment and causes further deterioration to water quality and aquatic habitats through eutrophication of rivers and lakes. If contaminated soils are eroded and transported to the sea, aquatic plants and animals can be severely damaged. Excavation of peat will result in carbon loss from the excavated peat and also in the areas affected by drainage.

³⁴https://www.hsa.ie/eng/Your_Industry/Chemicals/Legislation_Enforcement/COMAH/List_of_Establishments

³⁵ EPA (2013) Environmental Indicators: Land & Soil Factsheet.

Degradation of soils can cause loss of soil as well as ecological soil processes which would lead to a reduction in its production capacity as well as deplete soil quality and biodiversity.

In terms of bedrock geology threats are present through construction – excavation of bedrock during earthwork operations for renewable energy infrastructure, restructuring of land without permission, etc. which can result in a loss of our geological heritage. These County Geological Sites (CGS) which are present in quite large areas at the northwest of the county (e.g., St. Brendan's cave system and Carran enclosed depression) require protection and preservation from potential damage due to renewable energy development if they are not assessed as constraints.

The raw material demands of emerging renewable energy solutions will be met by a sustainable supply of extractable natural resources. Extraction ultimately leads to the total removal of a resource within a given area and can lead to localised environmental issues. Due to the nature of quarrying it can result in re-profiling of the landform which can have adverse visual impacts on the landscape and on scenic routes.

As a result of prolonged rainfall causing water table rise in the limestone lowland areas in the west of the county, County Clare is subjected to the most extensive groundwater flooding in the country. Groundwater flooding will have implications for RE infrastructural development.

The transferring of soil during construction works can facilitate the spread of invasive species whereby roots can be transferred from one location to another.

In north County Clare, extensive deepwater limestones form a productive karstic aquifer and therefore better groundwater supplies making them more suitable for geothermal boreholes and open-loop Ground Source Heat Pumps, areas with high groundwater vulnerability and shallow soils may be unsuitable for a range of land activities and subsurface infrastructures related to other renewable technologies (e.g., wind turbines, solar farms, etc.), depending upon site specific conditions.

In summary the key issues for the draft RES in relation to soils, land cover and geology therefore relate to:

- Increased competition for space from different sectors: RE, forestry, agriculture;
- Land use changes and land restructuring which may result in increased soil erosion and mobilised sediment into nearby watercourses;
- Loss of agricultural land/good quality soils (and any associated economic losses) to RE development, particularly solar farms;
- Loss of wetlands through changes in land use and new infrastructural developments;
- Potential for loss of peatlands through land drainage and reclamation for RE development, with knock-on impacts for climate change;
- Potential for disturbance to contaminated soil or historic sites from development and excavation works;
- Excess sediment run-off from RE infrastructure construction in aquatic ecosystems creating the potential to damage aquatic flora and fauna;
- Changes or damage to geomorphological landforms as a result of drainage works/dredging for new harbour facilities;
- Soil and/or vegetative cover loss or disturbance through the removal or compaction of soil during construction of RE infrastructure;
- Degradation of soil quality and ecological processes;
- Excavation of bedrock leading to removal of a natural resource;
- Loss or damage to geological heritage;
- Susceptibility of RE infrastructure to the risks of groundwater flooding.

5.8.10 What would happen to Soil and Geology without the Implementation of the Plan?

In the absence of the RES the soils, geology and hydrogeology would continue in the same pattern. There is currently little in the way of direct EU or national legislation obliging Ireland to maintain soil quality.

Renewable developments may end up located in unsuitable areas with regards to the soils and geology of the area. Geothermal energy developments for example, need to be located away from karst areas or where there is an existing high groundwater vulnerability rating and a shallow soil profile (which are unable to accommodate subsurface structures), or where karst is located near the surface as there may be hydrological implications for groundwater. Developments should also be located away from significant peat or bog areas as these areas may be unstable from a technical perspective, or could be under designation

5.8.11 Data Gaps/Difficulties

The following data gaps have been identified in terms of the assessment of soils and geology:

- The lack of a register of contaminated sites and associated mapping for the County with the associated risk of inadequate disposal measures of contaminated soils due to lack of information of contaminated sites.
- The absence of the previously proposed Soil Framework Directive for Soils poses a difficulty in that currently at EU level there is no overarching framework that defines policy priorities or parameters for soil protection.
- Unregulated extraction from unauthorised quarrying within the plan area.

5.9 Air and Climate (RPS)

5.9.1 Introduction

The quality of the air that we breathe is dependent upon the climate that we live in and the changes that are occurring, and will continue to do so in the future. The pace at which this change occurs will be influenced by the management of our air quality, by means of compliance with regulations (statutory instruments) regarding the release of emissions into the atmosphere from such sources as vehicle emissions and fuel combustion.

5.9.2 Air Quality

Ireland has good air quality which is consistently rated among the best in Europe. This is due largely to the prevailing clean westerly air-flow from the Atlantic and the relative absence of large cities and heavy industry. The Clean Air for Europe (CAFE) Directive (2008/50/EC) deals with each EU member state in terms of "zones" and "agglomerations" for managing air quality. For Ireland, four zones are defined in the Air Quality Standards Regulations (S.I. No. 180 of 2011), amended in 2013 to take account of population counts from the 2011 census and to align with the coal restricted areas in the 2012 Regulations (S.I. No. 326 of 2012):

- Zone A – Dublin;
- Zone B – Cork;
- Zone C – Other Cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, **Ennis**, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.; and
- Zone D – Rural Ireland i.e. the remainder of the State excluding Zones A, B and C.

The majority of County Clare falls within Zone D with the exception of Ennis Town and surrounding urban area which falls under Zone C. Ennis and Environs falls within Zone C and the main influences on air quality here are from transport and industrial activity.

The Environmental Protection Agency (EPA) manages the National Ambient Air Quality Network. This network is a series of air quality monitoring stations that are located across the country. The national network is supported by a network of 'local monitoring stations'. These stations collect air quality data for public information on www.airquality.ie. This is assessed against European legal limit values and stricter World Health Organization (WHO) guideline values.

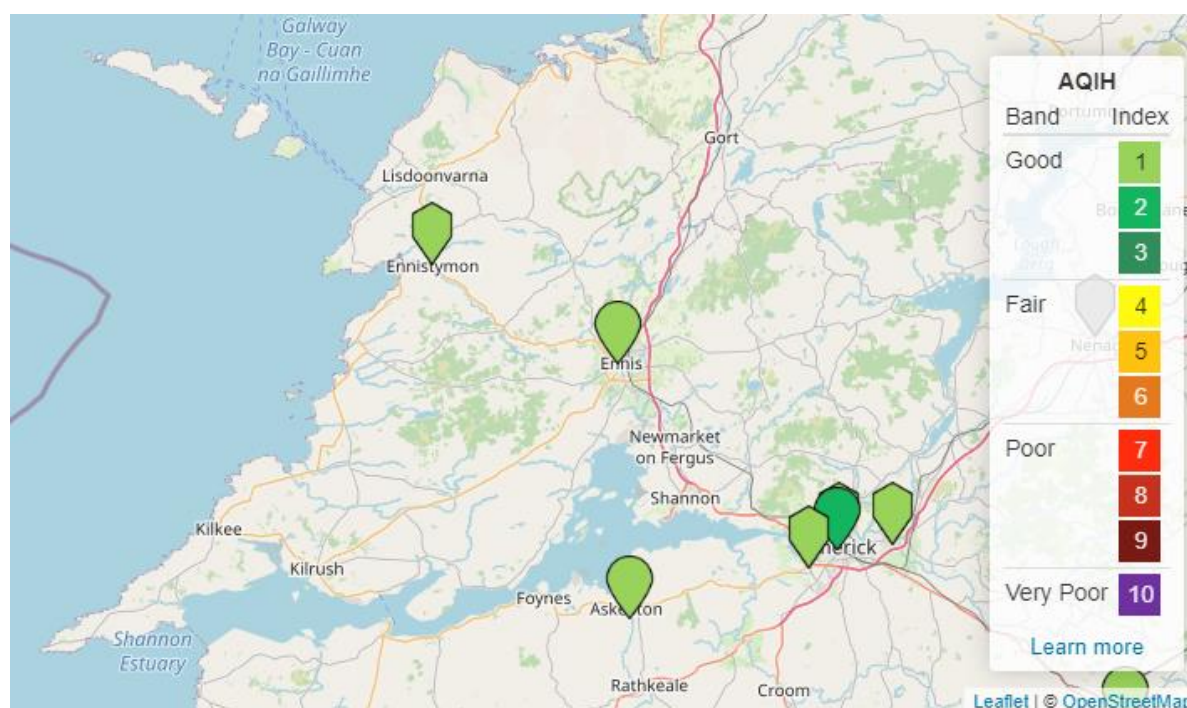
At a national level, the most recent EPA report on Air Quality in Ireland 2019 (EPA, 2020) notes that while air quality in Ireland is generally good, there are however localised issues in some cities, towns and villages. In 2019 there was an exceedance of the EU and stricter WHO limit values of NO₂ at one urban traffic station in Dublin due to pollution from transport. The measured particulate matter and fine particulate matter (PM₁₀ and PM_{2.5} respectively), nitrogen dioxide (NO₂), ozone, sulphur dioxide (SO₂), polycyclic aromatic hydrocarbons (PAH), dioxins and all other pollutants were all below the EU emission limit value. Ireland was above the stricter WHO air quality guideline values SO₂ at 1 station; PM₁₀ at 14 stations (24hr WHO guideline daily value); PM_{2.5} at 25 stations (24hr WHO guideline daily value) and at 5 stations (for the WHO guideline annual average value); and ozone at 2 stations. Ireland was above the European Environment Agency reference level for PAH at 4 monitoring sites due to the burning of solid fuel.

Residential use of solid fuel for home heating such as coal, peat and wood remain the biggest problem for air quality and health in Ireland, and remains the leading contributor to PM_{2.5} pollution across Ireland.

Within County Clare, there is a monitoring station located in Ennis (National Network) at the Local Authority building at Waterpark House and a station at Ennistymon (Local Network) located at the public library. The air quality index is calculated based on the information gathered from the monitoring stations using a Quality Index for Health, which is calculated every hour and indicates if air quality is good, fair, poor or very poor. The air quality readings in County Clare, namely that of Ennistymon and Ennis are currently "Index 1 Good".³⁶ [Refer to Figure 5.9.1 for Air Quality Index for County Clare.](#)

³⁶ Retrieved for 12pm on the 26th May 2021. Daily up to date information available for download from the EPA at: <http://www.epa.ie/air/quality/#.VgAeTlc4ygl>.

Figure 5.9-1: Air Quality Index for County Clare



Source: EPA, <https://airquality.ie/>

Greenhouse Gas Emissions

Greenhouse gases (GHGs) in the atmosphere are rising as a result of human activity, in particular the burning of fossil fuels for heating, energy and transport, in addition to other activities such as agriculture and waste.

At a national level, according to the EPA's *Final GHG Inventory Report* for the period 1990-2019³⁷, emissions of GHGs in Ireland are estimated to be 59.78 million tonnes (Mt) carbon dioxide equivalents (CO₂eq) in 2019. This is 4.4% lower than emissions in 2018 despite the economy continuing to grow. Emissions reductions have been recorded in 6 of the last 10 years of inventory data (2009-2019). This 2019 reduction in total emissions is driven by the *Energy*, *Agriculture* and *Transport* sectors. The final estimates of greenhouse gas emissions for the period 1990-2019 indicate that Ireland will exceed its 2019 annual limit set under the EU's Effort Sharing Decision (ESD) by 6.85 Mt CO₂eq. This makes it highly unlikely that Ireland will meet its overall 2020 targets under the scheme, regardless of the impact of COVID on emissions in 2020.

In 2019, emissions from Ireland's Emissions Trading Sector [ETS] (which covers power stations, large industrial plants and airlines) decreased by 8.7% or 1.34 Mt CO₂eq while non-ETS emissions (covered by the EU Effort Sharing Decision) decreased by 3% or 1.41 Mt CO₂eq. *Agriculture* remains the single largest contributor to the overall emissions at 35.4% of the total. *Transport* and *Energy Industries* are the second and third largest contributors at 20.4% and 15.8% respectively. *Residential* and *Manufacturing Combustion* emissions account for 10.9% and 7.7% respectively. These five sectors accounted for 90% of national total emissions in 2019. The remainder is made up by the *Industrial Processes* at 3.8%, *F-Gases* at 1.5%, *Commercial Services* at 1.5%, *Public Services* at 1.5% and *Waste* at 1.5%.

Emissions from the *Energy Industries* sector in 2019 show a decrease of 11.2% or 1.19 Mt CO₂eq compared to 2018, which is attributable to a 69% decrease in coal and an 8% decrease in peat used in electricity generation. Emissions from the *Residential* sector decreased by 7.3% or 0.52 Mt CO₂eq due to significant reductions in fossil fuel use, with coal down by 29% and peat use down by 7%. Kerosene and natural gas use in households in 2019 also decreased by 4% and 2% respectively as a result of a warmer winter in 2019 compared to 2018.

³⁷ EPA (2020) Ireland's Final Greenhouse Gas Emissions 1990-2019.

The EPA has also published its Greenhouse Gas Emission Projections for 2019 – 2040.³⁸ The report provides an updated assessment of Ireland's total projected greenhouse gas emissions out to 2040 which includes an assessment of progress towards achieving its emission reduction targets out to 2020 and 2030 set under the EU Effort Sharing Decision (Decision No 406/2009/EU) and Effort Sharing Regulation (Regulation (EU) 2018/842).

The EPA's latest emissions projections show a significant shift in terms of decarbonising the Irish economy in the period out to 2030. The EPA has produced two scenarios in preparing these greenhouse gas emissions projections; a With Existing Measures (WEM) scenario and a With Additional Measures scenario (WAM), which includes the impact of the 2019 Climate Action Plan (CAP). Under the WEM scenario, total GHG emissions are projected to decrease from the current levels by 2.5% by 2030. Full implementation of the measures contained in the Climate Action Plan i.e. under the WAM scenario, would see a reduction in Ireland's total emissions by up to 23% by 2030.

In the short term, Ireland is set to miss its target for compliance with the EU's Effort Sharing Decision 2020 targets. Ireland's non-ETS emissions³⁹ are projected to be 2% and 4% below 2005 levels in 2020 under the WEM and WAM scenarios, respectively.

In the longer term, Ireland will meet its 2030 target under the ESD as long as there is early and full implementation of the Climate Action Plan measures. Ireland will also need to avail of, at a minimum, Land-use, Land-use Change and Forestry (LULUCF) flexibilities provided for in EU legislation in order to comply.

Electricity generation, agriculture and transport, which continue to be key sectors that dominate Ireland's emissions profile, are all projected to decline by 2030, based on implementation of the measures in the Climate Action Plan. For electricity generation, this will mean scaling up of the contribution of renewable to 70% by 2030. For agriculture this will mean implementing measures such as those set out in Teagasc's Marginal Abatement Cost Curve. For transport, this will mean almost one million electric vehicles on Irish roads by 2030 and a considerable increase in the use of biofuels.

The latest projections are underpinned by projected strong economic growth. These projections do not include the impact of Covid-19 which are intended to be included in the next round of projections.

Other Transboundary Emissions

The latest report from the EEA on the data submitted by Member States under the National Emissions Ceiling (NEC) Directive indicates that air pollution continues to be one of the major challenges in Europe, harming human health and the environment.⁴⁰

Under the revised NEC Directive (2016/2284/EU), Ireland is therefore required to limit the annual national emissions of the following transboundary pollutants: sulphur dioxide (SO₂), nitrogen oxides (NO_x), volatile organic compounds (VOC), ammonia (NH₃) and fine particulate matter (PM_{2.5}). Ireland's emissions ceilings under the NEC Directive applied until December 2019 with reference to 2005 as the base year. Article 4(1) and Annex II of the revised NEC Directive sets out new national emission reduction commitments for SO₂, NO_x, NMVOC, NH₃ and PM_{2.5} which will be applicable from 2020 to 2029, and 2030 onwards; see **Table 5.9.1**.⁴¹ The latest data is available up to 2018.

³⁸ EPA (July 2020) Ireland's Greenhouse Gas Emissions Projections 2019-2040.

³⁹ These sectors cover agriculture, transport, built environment (residential, commercial/institutional), waste and non-energy intensive industry

⁴⁰ EEA (2020) National Emission reduction Commitments Directive reporting status 2020

⁴¹ EPA (June 2020) Ireland's Air Pollutant Emissions 1990-2030

Table 5.9.1: Ireland's National Emissions Ceiling Directive 2020 and 2030 Targets

Pollutant	Current 2010-20 Targets (kilotonnes)	Emissions Trends (kilotonnes)					New Reduction Commitments (kilotonnes)	
		2014	2015	2016	2017	2018	2020	2030
SO ₂	42	17.015	15.145	13.782	13.540	12.258	25.574	10.960
NO _x	65	106.305	106.187	107.828	107.963	107.755	66.836	40.626
NM VOC	55	103.456	103.577	105.269	109.942	109.784	56.335	51.077
NH ₃	116	108.266	110.695	116.160	118.441	119.339	112.06 6	107.539
PM _{2.5}	N/A	13.419	13.928	12.663	11.979	12.043	15.606	11.229

SO₂ emissions from Ireland have seen a consistent downward trend year on year since 1990. The main sources are combustion-related, mainly from the power stations and in the residential/commercial sectors (23.2% and 51.7% respectively) followed by the industrial sector (21.8%).⁴² Emissions are projected to reduce even further to 2030.

Emissions of NO_x contribute to acidification of soils and surface waters, tropospheric ozone formation and nitrogen saturation in terrestrial ecosystems. Road transport is the primary source (40.6%). This is followed by agriculture (32.4% of the total for 2018). The *industrial, power generation* and *residential/commercial* sectors are the other main sources of NO_x emissions, with contributions of 8.7%, 6.3% and 7.4% respectively in 2018. The remainder of NO_x emissions emanate from combustion in the agriculture sector and others (refining and storage, solid fuel manufacture, fugitive emissions and waste); together these sectors produced around 4.8% of the total in 2018. NO_x emissions have been consistently above the NEC, reflective of Ireland's ongoing challenge in complying with the ceiling. Progress in reducing emissions has been difficult, even with the large reductions in emissions from power stations in recent years. Under the WAM scenario, NO_x is projected to be just 1 kilotonne under the 2030 ceiling limit.

NH₃ emissions are associated with acid deposition and can contribute to the formation of particulate matter. Emissions have remained relatively steady with small fluctuations year on year. Ireland has exceeded the emission ceiling in 2016, 2017 and 2018. These increases are attributed to increasing numbers of dairy cattle and use of synthetic fertilisers. Road transport accounts for a small proportion (< 1%) of emissions (petrol passenger cars with three-way catalysts). Reducing NH₃ emissions will be challenging and Ireland is projected to still exceed the ceiling limits in 2020 and 2030, even under the WAM scenario.

NM VOCs are emitted as gases by a wide array of products including paints, paint strippers, glues, cleaning agents and adhesives. NM VOCs also arise as a product of incomplete combustion of fuels and, as such, are a component of vehicle exhaust emissions. They also arise from the storage of animal manures and fertilisers in agriculture, and from the food and drink industry. NM VOCs contribute to the formation of ground level (tropospheric) ozone, with some species such as benzene and 1,3 butadiene being directly hazardous to human health.⁴³ In 2018 the main sources of these emissions in Ireland are from manure management in agriculture (39.4%), the food/beverages industry (24.4%) and solvent use (20.8%). Coal burning in the residential sector is an important but declining source as coal consumption decreases. Emissions from stationary combustion of fossil fuels across all sectors (power stations, residential, commercial, and agriculture) account for 10.9% of national emissions. Transport emissions account for 4.9% of national emissions, mainly from exhaust and fugitive releases from gasoline vehicles. The addition of emissions from fertilisers over the past three reporting years, plus sources from the food and beverages sector to Ireland's reporting has added an average of 56.3 kilotonnes to the national total, effectively doubling previously reported

⁴² EPA (June 2020) Ireland's Air Pollutant Emissions 1990-2030. Available at: <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-air-pollutant-emissions-2018-1990-2030.php>

⁴³ EEA (2015) Indicator Assessment: Non-methane volatile organic compounds (NM VOC) emissions

emissions. This represents a significant challenge for Ireland to achieve reductions, with the WAM scenario projections indicating Ireland will be just over the 2030 ceiling by 0.08 kilotonnes.

PM is ubiquitous and there are many sources of dust including vehicle exhausts, surfaces such as soils and roads, industry emissions, construction activities as well as formation from reactions between different pollutant gases. PM₁₀ (dust particles with a diameter less than 10 µg) is small enough to be inhaled into the lungs however fine particulate matter (PM_{2.5}, diameter less than 2.5 µg) is considered a better measure of anthropogenic sources of particulate matter. The main source in Ireland is fossil fuel combustion in the commercial and residential sectors (54.9%), with transport contributing 13.8%. Emissions from the *Other* sector account for 7.5% of 2018 emissions and comprise emissions from the manufacture of solid fuels and oil refining/storage, construction and demolition, minerals, paving sectors etc. Emissions from agriculture accounted for 7.4% of PM emissions. Ireland is currently meeting its PM_{2.5} ceiling target, and projections under the WAM scenario indicate Ireland will be under the 2030 ceiling limit.

Domestic Solid Fuel Burning

Burning of fossil fuels such as coal is a major factor in air pollution. The sale of bituminous (smoky) coal was banned in Dublin in the early 1990's in an effort to address this issue. The control of domestic burning of bituminous fuel (smoky coal) is administered through the Air Pollution Act (Marketing, Sale, Distribution and Burning of Specified Fuels) Regulations 2012 (S.I. No. 326 of 2012), as amended.

The ban saw an improvement in smoke and sulphur dioxide levels. Limiting harmful emissions of air pollutants arising from the use of residential fuels will contribute to safeguarding air quality.

A ban on the burning of bituminous coal and other prohibited fuels now applies in all smoky coal ban Low Smoke Zones to complement the ban on the marketing, sale and distribution. Under the Smoky Coal Ban Regulations 2012-2020 the ban now applies to all towns with populations over 10,000 people. Ennis and its environs is designated as a Low Smoke Zone.

A nationwide Low Smoke Zone is expected to be introduced in the coming years to improve air quality and human health for the entire population.

5.9.3 Issues and Threats in the Plan Area

In general, ambient air quality in Ireland is consistently good, due largely to the prevailing clean westerly air-flow from the Atlantic, and the relative absence of large cities and heavy industry. With the nationwide ban on smoky fuel effective from 2019, the use of wood and biomass as alternatives may be perceived as a potential "clean" heating source. However, research has shown that such fuel alternatives can also lead to equally high levels of particulates and PAHs. On the one hand, moving away from hydrocarbon fuels is overall positive for air quality and climate action at a regional and national scale, but adopting the widespread use of biomass as a heating source has the potential to impact negatively on local air quality.

Increasing population and the demand for electricity, heating fuels, construction materials and vehicle ownership are some of the national drivers for air emissions in Ireland. Ireland also has a large agricultural and food production and export industry, a key driver for ammonia emissions. Expected growth in the agricultural sector along with the removal of milk production quotas within the EU will increase pressure on future emissions to air from this sector.

Fine particulate matter can be emitted directly into the atmosphere or can be formed secondarily, with the main source being combustion of fossil fuels. While Ireland is currently meeting its 2020 national ceiling limit target, reductions to 2030 will be challenging as it requires an integrated approach across a number of sectors including industrial, transport and residential emissions.

The test in meeting Ireland's NO_x obligations under the NEC Directive is also challenging, as Ireland's NO_x levels have exceeded its emission ceilings for all years since 2010, with transport emissions being the greatest source of NO_x, as well as a source of PM_{2.5}.

The EU Commission's targets require Ireland to deliver a 20% reduction in emissions of GHGs relative to 1990 levels by 2020, and a 30% reduction by 2030 under the 2030 Climate and Energy Framework. At a national level, Ireland's National Policy Position is to achieve an aggregate reduction of at least 80% on 1990 levels by 2050 across the electricity generation, built environment and transport sectors. Bill 82 of 2018 to amend the Climate Action and Low Carbon Development Act

intends to specify a GHG emissions reduction of 40% by 2030 to be included in the next NMP and NAF.

Ireland's total national GHG emissions are estimated to have declined by 4.5% on 2018 levels to 59.90 million tonnes carbon dioxide equivalent (Mt CO₂eq) in 2019, despite the economy continuing to grow. This is a step in the right direction but the challenge will be to sustain and reduce further over the coming decades, as national projections indicate Ireland will exceed its 2019 annual limit set under the EU's Effort Sharing Decision (ESD) by 6.98 Mt CO₂eq. This makes it highly unlikely that Ireland will meet its overall 2020 targets under the scheme, regardless of the impact of COVID on emissions in 2020.

Capacity of the grid to accept the levels of electricity capable of being generated by renewable means; There will need to be a requirement for close liaison with EirGrid in regard to Grid 25 Strategy. Issues could also arise in project proximity to grid connection.

The RES has the potential to change agricultural practices and create new demands on rural areas should there be a growing demand for fuel to serve the renewable energy industry (e.g. woodland and energy crops as biomass).

RES and Impacts on Air Quality

- Potential for improvements in air quality from greater use of RE.
- Potential for reduction in emissions of greenhouse gases from increased development of RE.
- Emissions arising from RE development (e.g., during construction, operation, maintenance or decommissioning activities), and from vehicle movements during these phases (e.g. PM, NO_x).
- The continuation of Moneypoint coal-burning power plant in Co. Clare poses a threat to the air quality of the county. The ESB's has plans to turn the Moneypoint site into a green energy hub - plans include transforming it into a renewable energy site over the next decade to include a 1,400 MW floating offshore windfarm, a turbine construction hub and a hydrogen production facility. The Clare RES will need to be cognisant of the Renewable Targets 2030 targets and the role Moneypoint will play in achieving these targets.

Further, the Climate change Adaptation Plan for the Electricity and Gas Networks Sector outlines the key climate change conditions which could affect the resilience of the electricity generation sector as follows:⁴⁴

- "Temperature: Average temperatures will rise by about 1.5 degrees Celsius by mid-century.
- Precipitation: wetter winters and drier summers.
- Extreme Events: increased frequency of heavy rainfall.
- Sea level rise: a rise of 50cm by 2100 is predicted.

Energy content of wind: increased energy content in winter and a decrease in summer months."

An issue facing County Clare in relation to climate change is the danger posed by the potential for an increase in the frequency and severity of flooding events. The county is vulnerable to from a number of hazard sources including: fluvial (river flooding), pluvial (flooding due to rainfall or other precipitation), coastal (e.g., tidal surges), groundwater (notably in karst regions, such as the Burren); flooding from reservoirs; development on floodplains and flooding in urban areas due to inadequate drainage and over-capacity sewers. Changes in the occurrence of severe rainfall events as a result of climate change could adversely impact upon the inhabitants of County Clare, its biodiversity, population and its economy. Solutions require the amelioration of potential flooding events as well as local measures as part of national efforts to reduce greenhouse gas (GHG) emissions. Based on past events, there is potential for flooding within County Clare, particularly in proximity to the River Fergus, Inagh River and Lough Derg.

⁴⁴ DCCAE (February 2018) Climate Change Adaptation Plan for the Electricity and Gas Networks Sector.

Another threat in the Plan area could be the argument to not pursue renewable projects since Clare is already within 1% of the 100% renewable energy target. Since all credited renewable electrical energy generated in County Clare is almost equal to the electrical energy consumed in Clare this results in a net zero CO₂ emission factor. In practice, the electricity mix supplied to County Clare will include fossil fuels and there are CO₂ emissions from other sectors. Increasing the generation of renewables within the County will help to reduce national dependence on fossil fuels, so County Clare can still go further to increase Renewable Energy generation.

5.9.4 What Would Happen to Air and Climate Without the Implementation of the RES?

This Renewable Energy Strategy outlines the potential for a range of renewable resources, including bioenergy and anaerobic digestion, micro renewables, geothermal, solar, hydro, energy storage, onshore and offshore wind, wave and tidal energy. It acknowledges the significant contribution they can make to County Clare being more energy secure, less reliant on traditional fossil fuels, enabling future energy export and meeting assigned targets. Therefore in the absence of a Plan the targets set out at European and national level could slip. In addition the RES sets out a target of meeting the County's Energy Needs from 100% Renewable Sources and in the absence of the Plan this target would be harder to meet and to maintain. Currently the majority of electricity generation in Clare comes from renewable sources in Clare (wind). Less than a 1% share was taken from the national electricity grid. Further without the Plan County Clare would not be a national leader in renewable energy generation. Without the Plan there would be a haphazard approach to renewable energy projects development which could have consequences within the Plan area. Such consequences in the absence of a Plan include the favouring of energy generation from less environmentally friendly sources which would impact negatively on air quality.

An issue facing County Clare and Ireland as a whole in relation to climate change relates to the danger posed by flooding events, which may occur, at least in part, as a result of increased amounts of global GHG emissions from for example transport and other sectors use of non-renewable resources. High incidence rainfall events are occurring more frequently which cause local flooding. Utilisation of renewable energy technologies will reduce GHG emissions and this in turn should help to mitigate the impacts from extreme weather events, as well as contributing to national emission targets as well as providing energy security. In the absence of the RES, wind farm development would continue to progress under the current wind energy strategy. The RES will add a more targeted and strategic approach to utilising other renewable energy resources in addition to wind power including solar, hydro etc.

5.9.5 Data Gaps/Difficulties

No particular difficulties encountered. The development of the Energy Emissions Balance for Clare in tandem with the RES and the wealth of sectoral data from EPA provides sufficient baseline data to identify baseline air and climate trends within County Clare.

In addition Climate Ireland accessed at developed in 2016 by the Centre for Marine and Renewable Energy (MaREI) at University College Cork (UCC) and the Irish Centre for High End Computer (ICHEC) at the National University of Ireland, Galway provides a wealth of detailed information on climate change and adaptation measures for Ireland. Prior to this resource there was a gap in accessing information specific to climate change in Ireland.

5.10 Water (W)

5.10.1 Introduction

A desk-based assessment of water quality in the study area was conducted. The sources of the water quality information include:

- Water Framework Directive (WFD) water body status information arising from the WFD monitoring programme (EPA, WFD Status 2013- 2018);
- Water Framework Directive water body risk arising from the WFD monitoring programme (EPA, 3rd Cycle Risk 2020);

- Bathing water quality information outlined in the EPA's most recent bathing water quality report;
- Bathing Water Quality in Ireland 2019 (EPA, 2019);
- Marine Strategy Framework Directive (MSFD);
- Nutrient sensitive areas under the Urban Wastewater Treatment Regulations, 2001 (SI No. 254 of 2001); and
- GSI aquifer vulnerability information.

5.10.2 Marine Environment

The marine environment and its ecosystems are subject to multiple pressures and impacts from human activities, such as fishing, seabed disturbance, pollution or global warming. As a response, the EU designed the Marine Strategy Framework Directive (MSFD) as a holistic policy to protect the marine environment of the seas around Europe while enabling the sustainable use of marine goods and services. The MSFD has been in force since 2008. It requires Member States to set up national marine strategies to achieve, or maintain where it exists, 'good environmental status' (GES) by 2020. The Directive is implemented in a six-year cycle with three major stages:

- (1) In 2012 and in 2018, Member States had to report on the status of their marine waters and set targets to achieve good environmental status based on the eleven 'descriptors' (objectives) set by the MSFD, which cover the health of ecosystems and the human pressures and impacts affecting them.
- (2) In 2014, Member States had to set up monitoring programmes to collect data to assess progress in achieving good environmental status and reaching targets.
- (3) In 2016, Member States had to set up programmes of measures that would help them to deliver their objectives, and in 2018 they had to report on their progress in implementing the programmes⁴⁵.

In Ireland the Department of Housing, Local Government and Heritage along with four other governmental agencies and the Marine Institute have been assigned to deliver the work required by the MSFD.

The following timeline was established:

- July 2010: Transpose the directive (Completed)
- July 2012: Complete [initial assessment](#) of Irish marine waters; [establish environmental targets and indicators](#) (Completed)
- July 2014: Establish a [monitoring programme](#) (Completed)
- July 2016: Establish a [programme of measures](#) to achieve GES (Completed)
- 2016: Implement the programme of measures and monitoring programme (Ongoing)⁴⁶

The Marine Strategy Framework Directive 2008/56/EC Article 17 update to Ireland's Marine Strategy Part 1: Assessment (Article 8), Determination of Good Environmental Status (Article 9) and Environmental Targets (Article 10) Assessment Sheets published in 2020⁴⁷ detailed the eleven-descriptors with conclusions from the most recent assessments in 2018 also noted:

⁴⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0259&from=EN>

⁴⁶ <https://www.gov.ie/en/publication/f8aa5-the-marine-strategy-framework-directive-msfd/?referrer=http://www.housing.gov.ie/water/water-quality/marine-strategy/marine-strategy-framework-directive-msfd#who-is-working-on-this>

⁴⁷ http://www.housing.gov.ie/sites/default/files/publications/files/appendices_-_assessment_sheets_.pdf

1. **Biodiversity** - the proportion of species achieving GES is currently 21%, which is below the lower threshold value of 60% advised by ICES.
2. **Non-Indigenous Species** - 3 no. newly introduced species have been identified in Irish Marine waters; (*Undaria pinnatifida*), Wakame or Asian kelp, (*Schizoporella japonica*), a bryozoan and (*Perphora japonica*), a colonial sea squirt. Significant progress has been made in implementing management processes aimed at minimising new introductions.
3. **Commercial Fish and Shellfish** - GES has been achieved for many but not for all commercially exploited fish and shellfish stocks in Ireland's waters. An estimated 25% of commercial stocks have not achieved GES.
4. **Food Webs** - With regard to all elements of the marine food webs in Ireland's maritime area, the environmental status is currently unknown.
5. **Eutrophication** - Overall, nutrient enrichment within Ireland's Assessment Area is good, with nutrient enrichment events reduced to a level that Good Environmental Status is achieved for this criterion.
6. **Sea Floor Integrity** - Quantitative thresholds are currently not available for the acceptable extent of loss of the benthic habitat type, resulting from anthropogenic pressures. This and associated methodologies are coordinated works in progress at EU and Member State level. However, the general objectives around physical loss of the seafloor have been met for Ireland's maritime area because the calculated extent of loss is lower than any potential threshold value. Hence Ireland is achieving GES for these MSFD criteria.
7. **Hydrographical Conditions** - The permanent alteration of hydrographical conditions during the period 2014 to 2018 is limited to 0.109 % of the Irish Marine Strategy Framework Directive area. The impact from these alterations was localised with respect to hydrographical conditions and the short-term water quality impacts experienced during the dredging and disposal activities. The adverse impacts on the marine ecosystems are minimal from the very limited hydrological changes which have occurred. There are no proposals to change the characteristic of Good Environmental Status as previously outlined in the Initial Assessment (2013) for Descriptor 7.
8. **Contaminants** - Good Environmental Status has been achieved for metal concentrations in biota in the Irish maritime area.
9. **Contaminants in Seafood** - The level of non-compliance for contaminants in seafood is extremely low and concentrations of these contaminants are generally well within the limits set in Commission Regulation 1881/2006 EC. Good Environmental status has been achieved for Descriptor 9.
10. **Marine Litter** –As baselines and thresholds have not yet been finalised, it is not possible to state whether or not Ireland has reached good environmental Status in relation to beach litter and for similar reasons it is not possible to state whether or not Ireland is in GES in relation to marine litter on the seabed or on the surface of the water column at this time as baselines and thresholds have not yet been set for these.
11. **Energy Including Underwater Noise** - The current state of the Irish marine environment is compatible with Good Environmental Status for spatial distribution, temporal extent, and levels of anthropogenic impulsive sound sources.

5.10.3 Water Framework Directive

Since 2000, water management in the EU has been directed by the Water Framework Directive 2000/60/EC (WFD). The Directive runs in 6-year cycles, its first cycle ran from 2009 – 2015. the second cycle runs from 2016 – 2021 and third cycle runs from 2021-2027. It requires that all member states implement the necessary measures to prevent a deterioration of the status of all waters, these being surface, ground, estuarine and coastal, and to protect, enhance and restore all waters with the aim of achieving 'good' status by 2027. Member states, under this Directive, must keep a register of all the water bodies that require more stringent measures in terms of protection by virtue of how the water is used by people and by wildlife. The European Union (Water Policy) Regulations 2014 give effect to a new three tier governance structure and administrative arrangements to bring "clarity and

certainty to the implementation of the Water Framework Directive”, whereby local authorities (Tier 3) will lead on implementation, enforcement and public engagement at local river level.

5.10.4 River Basin Management Plan 2018-2021

Ireland is required to produce a river basin management plan (RBMP) under the Water Framework Directive (WFD) every six years. The first cycle RBMP covered the period 2009–2015. Due to delays in developing the second cycle RBMP, this Plan covers the period 2018–2021. Currently the third-cycle Plan for 2022–2027 is being developed:

- For the 2nd Cycle, the Eastern, South Eastern, South Western, Western and Shannon River Basin Districts were merged to form one national River Basin District. In relation to the North Western and Neagh Bann International River Basin Districts a single administrative area was established in the Republic of Ireland portion of these two IRBDs for the purpose of coordinating their management with authorities in Northern Ireland. In the first cycle, the structure of multiple RBDs did not prove effective, either in developing the plans, or in implementing them. It is now apparent that a single River Basin structure is a more sensible way of ensuring that resources are used efficiently and that the similar challenges faced across the country are addressed in a coherent way. The plan saw the development of a Blue Dot Catchments Programme which will create a network of excellent river and lake areas. Agencies will work together to protect or restore excellent water quality in these water bodies.

The Irish River Basin District covers an area of 70,273km². This has been broken down into 46 catchment management units. These units are, in the main, based on the hydrometric areas in use by authorities — with, for example, the River Shannon being sub-divided on the basis of the catchments of its major tributaries. The 46 catchment management units have been broken down further into 583 sub-catchments. These 583 sub-catchments contain a total of 4,829 water bodies⁴⁸.

Of the 46 Catchments in Ireland Clare County is part of 4 of them;

- Lower Shannon (No. 25C and 25D);
- Shannon Estuary North (No.27);
- Mal Bay (No.28); and
- Galway Bay South East (No. 29).

The Catchment as the basis of water management is not a new concept; however, Integrated Catchment Management is new to Ireland. The Catchment dataset forms part of a three-tier hierarchy. The base unit, and tier 1, are the WFD River waterbodies (RWB). The middle tier will consist of the WFD Sub catchments and the final tier, tier 3 will be the WFD Catchments. The Catchments dataset is built using clusters of these RWB basins. See **Figure 5.10-1** for Catchments and sub catchments within County Clare.

5.10.5 WFD Waterbody Status

Environmental Quality Standards (EQSs) for classifying surface water status are established in the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (SI 272 of 2009). These regulations set standards for biological quality elements, physico-chemical conditions supporting biological elements (including general conditions and specific pollutants), priority substances and priority hazardous substances.

The ‘ecological status’ of a water body is established according to compliance with the EQSs for biological quality elements, physico-chemical conditions supporting biological elements and relevant

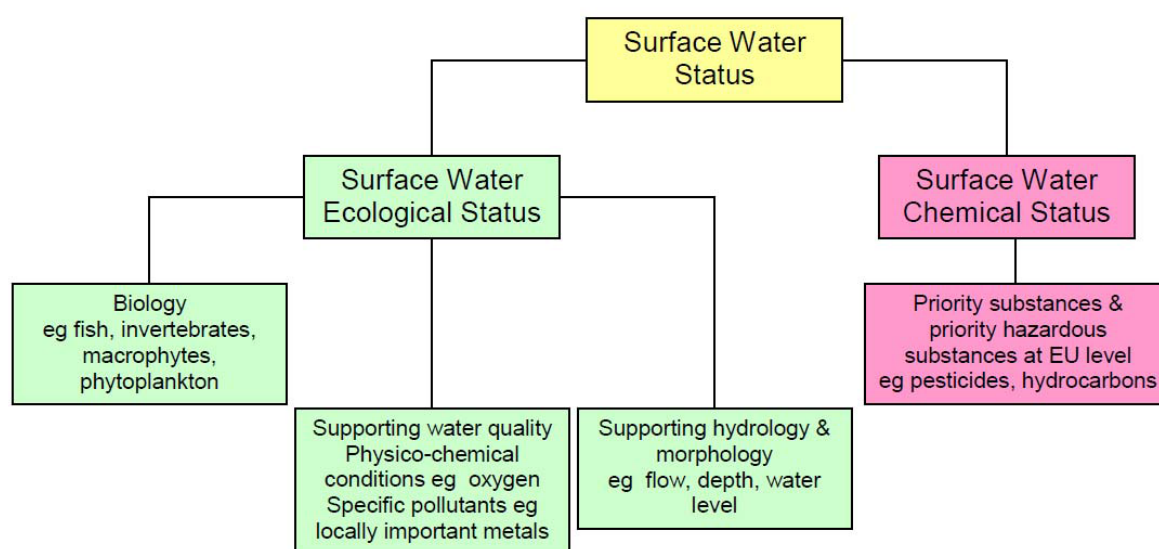
⁴⁸ <https://www.gov.ie/en/publication/429a79-river-basin-management-plan-2018-2021/?referrer=http://www.housing.gov.ie/water/water-quality/river-basin-management-plans/river-basin-management-plan-2018-2021>

Pollutants. The 'chemical status' of a water body is established according to compliance with the EQSs for priority substances and priority hazardous substances (SI 272 of 2009). Refer to **Plate 5.10-1** below.

In order to establish the WFD status of water bodies, the EPA developed a new, WFD-compliant monitoring programme which began in 2006. The EPA published WFD status classifications for the period 2013-2018 based on the data collected during the period (EPA, 2019a). Water Quality in Ireland reports have also been published by the EPA providing an update on the quality of water in rivers, lakes, transitional, coastal waters and groundwater. The most recent report was published in 2019 using information collected in this year (EPA, 2019b). In 2021 the EPA published Irelands National Water Framework Directive Monitoring Programme 2019-2021 report which sets out the structure and content of Irelands WFD monitoring programme for these years (EPA, 2021).

In addition, the EPA produce a produces State of the Environment reports on a four-yearly cycle. The report provides timely information and knowledge to the public, policymakers and key economic sectors in support of action to protect and manage the environment. The most recent report was published in 2020 and includes a water quality and marine environment chapters.

Plate 5.10-1: Elements of Surface Water Status



The WFD water body status (2013-2018) of the surface and groundwater bodies within County Clare and published by the EPA in 2018 and illustrated in **Figure 5.10-2** (River & Lake) and **Figure 5.10-3** (Transitional and Coastal status).

Clare County Council published a synopsis of water quality in County Clare extracted from the EPA's Water Quality Report for the monitoring periods of 2013-2018⁴⁹. The 2013-2018 period found that in Clare 48% of rivers have satisfactory water quality (High or Good Status) compared to 64% in the 2010-2015 WFD status, a deterioration of 16% over the two monitoring periods. 62 river waterbodies, 12 Lake waterbodies, 2 groundwater bodies and 3 transitional waterbodies are at risk of failing to achieve WFD objectives. The hydrometric areas in County Clare are Lower Shannon (No.25C and 25D), Shannon Estuary North (No.27) Mal Bay (No.28), and Galway Bay South East (No. 29). Overall, the current situation for rivers and lakes in County Clare;

- 4 rivers and 1 coastal waterbody have **High** quality status
- 48 rivers, 7 lakes, 27 groundwater bodies, 1 transitional waterbody and 1 coastal waterbody have **Good** Water quality status

⁴⁹ <http://clareppn.ie/wp-content/uploads/2020/10/County-Clare-Corporate-PP-to-SPC-Oct-2020.pdf>

- 25 rivers, 6 lakes, 2 ground waterbodies and 1 transitional waterbody have **Moderate** Water quality status.
- 33 rivers, 1 lake, 2 groundwater bodies and 2 transitional waterbodies have **Poor** Water quality status.
- 1 river, 2 lakes and 1 transitional waterbody have **Bad** Water quality status.

The table below summarises the current WFD for all waterbodies in Co. Clare including transitional, coastal and groundwater.

Table 5.10.1: Waterbody WFD Status in County Clare (2013-2018)

Water Body Type	No. Water Bodies ⁵⁰	% Water Bodies	% Water Bodies
River Water Bodies			
High Status	4	2.5%	37.5%
Good Status	48	35%	
Moderate Status	25	18%	42%
Poor Status	33	23.5%	
Bad Status	1	0.5%	
Unassigned	26	20%	20%
Lake Water Bodies			
High Status	0	0%	24%
Good Status	7	24%	
Moderate Status	6	20.5%	31%
Poor Status	1	3.5%	
Bad Status	2	7%	
Unassigned	13	45%	45%
Transitional and Coastal Water Bodies			
High Status	1	4.5%	13.5%
Good Status	2	9%	
Moderate Status	1	4.5%	18%
Poor Status	2	9%	
Bad Status	1	4.5%	
Unassigned	16	68.5%	68.5%
Groundwater Bodies			
High Status	0	0%	93%
Good Status	27	93%	
Moderate Status	0	0%	7%
Poor Status	2	7%	
Bad Status	0	0%	
Unassigned	0	0%	0%

Of particular note since the last RBMP is the decline in High Status water bodies across Ireland. In Clare, there are four high status river water bodies, Ardclony_010, Ayle_010, Corra_020 and Glenomra Wood Stream_010, all of which are within Hydrometric Area 25 – Lower Shannon.

⁵⁰ Status taken from EPA data available at <https://gis.epa.ie/GetData/Download> Accessed May 2021.

Across Ireland, high ecological status objectives has been set for 319 river water bodies which are either at high status or were at high status in the recent past, but which have since declined⁵¹. The aim of this is to protect the water bodies which are currently at High Status and restore those which were High Status in the recent past. Of these, 13 High Status Objectives Waters⁵² are found within County Clare; Owenslieve_010, Aughaglanna_010, Blackwater (Clare)_010, Ardclony_010, Broadford_020, Owenogarney_020, Cloghaun_010, Ayle_010, Graney (Shannon)_030, Corra_020 and Bleach_020. The Owendalulleagh_040 and Owendalulleagh_050 are both found on the border of Clare and Galway and small tributaries of these rivers rise within Clare County.

Over the 2013-2018 period 37 river waterbodies and 3 lake waterbodies deteriorated in water quality status while only 5 river waterbodies and 1 lake waterbody improved in water quality status.

The most common sources of pollution encountered in County Clare was eutrophication from excessive nutrient inputs, organic pollution from slurry, fertilisers and sewage and siltation. Overland runoff from agricultural land and breakdown of organic matter such as sewage from urban wastewater treatment plants and commercial developments. Another source of Eutrophication and siltation issues has been attributed to areas where land is disturbed for forestry plantations. Hydromorphological impacts have been attributed to agricultural drainage.

Water bodies identified as being At Risk of not achieving their environmental objectives need to have targeted measures implemented to achieve objectives under this Plan. The manner and the timeframe in which these targeted measures are implemented need to be prioritised to take account of the finite resources available and of the time and resources needed to develop appropriate measures. During the development of the second cycle RBMP, a prioritisation exercise was undertaken by the local authorities, the EPA and other stakeholders to identify those water bodies that require immediate action within this plan cycle to 2021.

Several river and lake water bodies in Clare have been identified as Areas for Action (AFA's); Doonbeg System, Lickeen System, Doo Lough and Annageeragh, Aille (Clare), Lower Graney, Inchiquin & Atedaun Lakes, Shallee, Carrigaholt, Broadford and Bleach & Lough Graney.

Clare County Council and LAWPRO have identified and proposed 125 water bodies for protection and restoration to be included in the 3rd cycle of the River Basin Management Plan (RBMP).

The EPA's water quality report 2013-2018⁵³ identified two transitional waterbodies (TWB) associated with County Clare at poor or bad status, with the Shannon airport lagoon TWB classified as at poor ecological status and the Lough Donnell TWB classified as at bad ecological status. The biological driver behind these classification for Shannon airport lagoon TWB and the Lough Donnell TWB is lagoonal communities.

Coastal waterbodies that have been surveyed during the 2013-2018 period are Outer Galway Bay (High Status) and the Mouth of the Shannon (23;27) (Good Status).

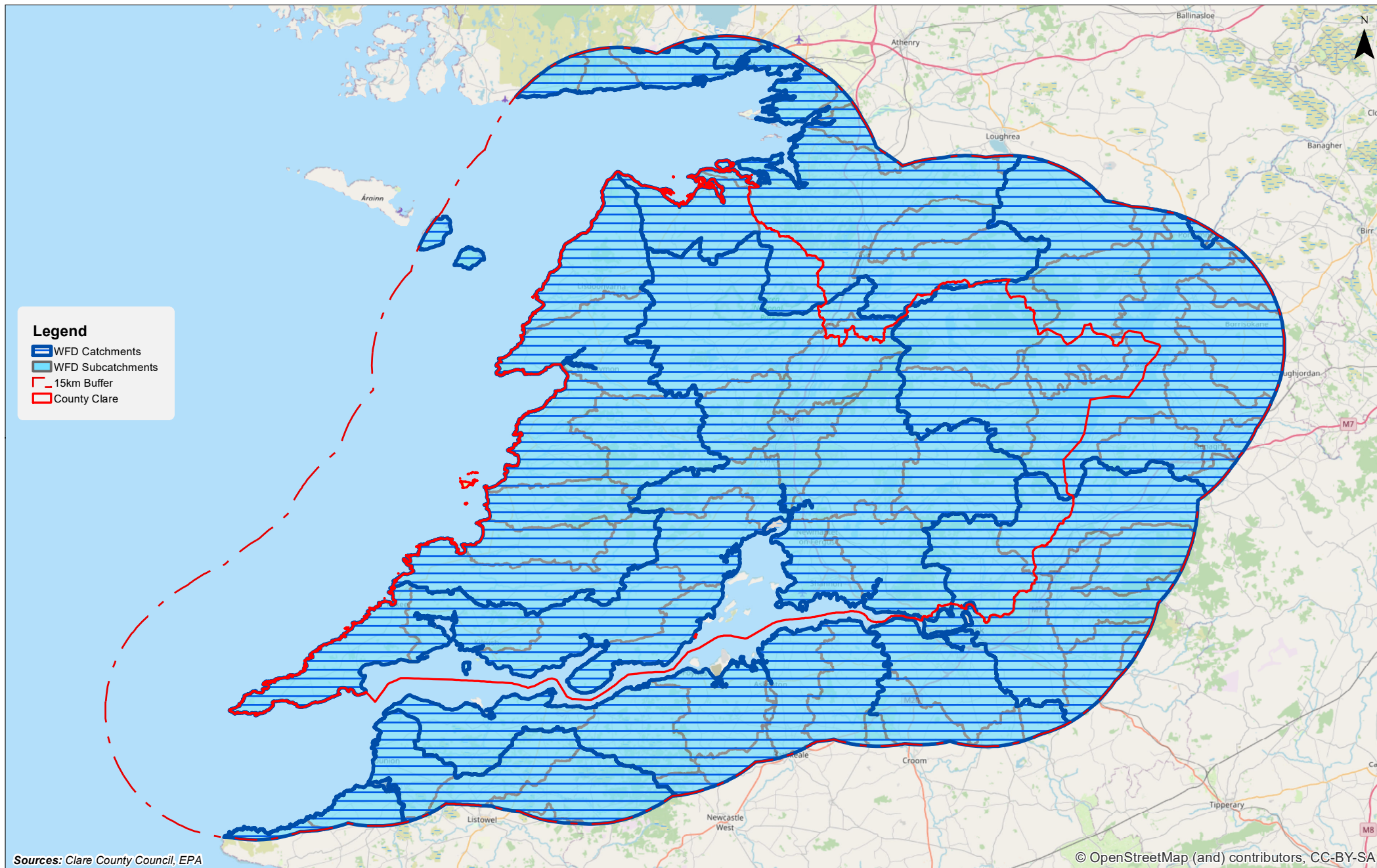
Overall water quality in Ireland compares favourably with that in other EU countries. However, similar to many other EU countries, Ireland still faces considerable challenges to meet the core objectives of the WFD within the required timeframes. Of particular note, in terms of change across status categories, is the continuing decline in the proportion of high status surface water bodies, which have decreased from 12.9% in 2007- 2009 (the first WFD baseline assessment) to 8.5% in 2013-2018, and the very unwelcome increase in the proportion of poor status surface water bodies, which have increased from 14.8% in 2007-2009 to 17.9% in 2013-2018

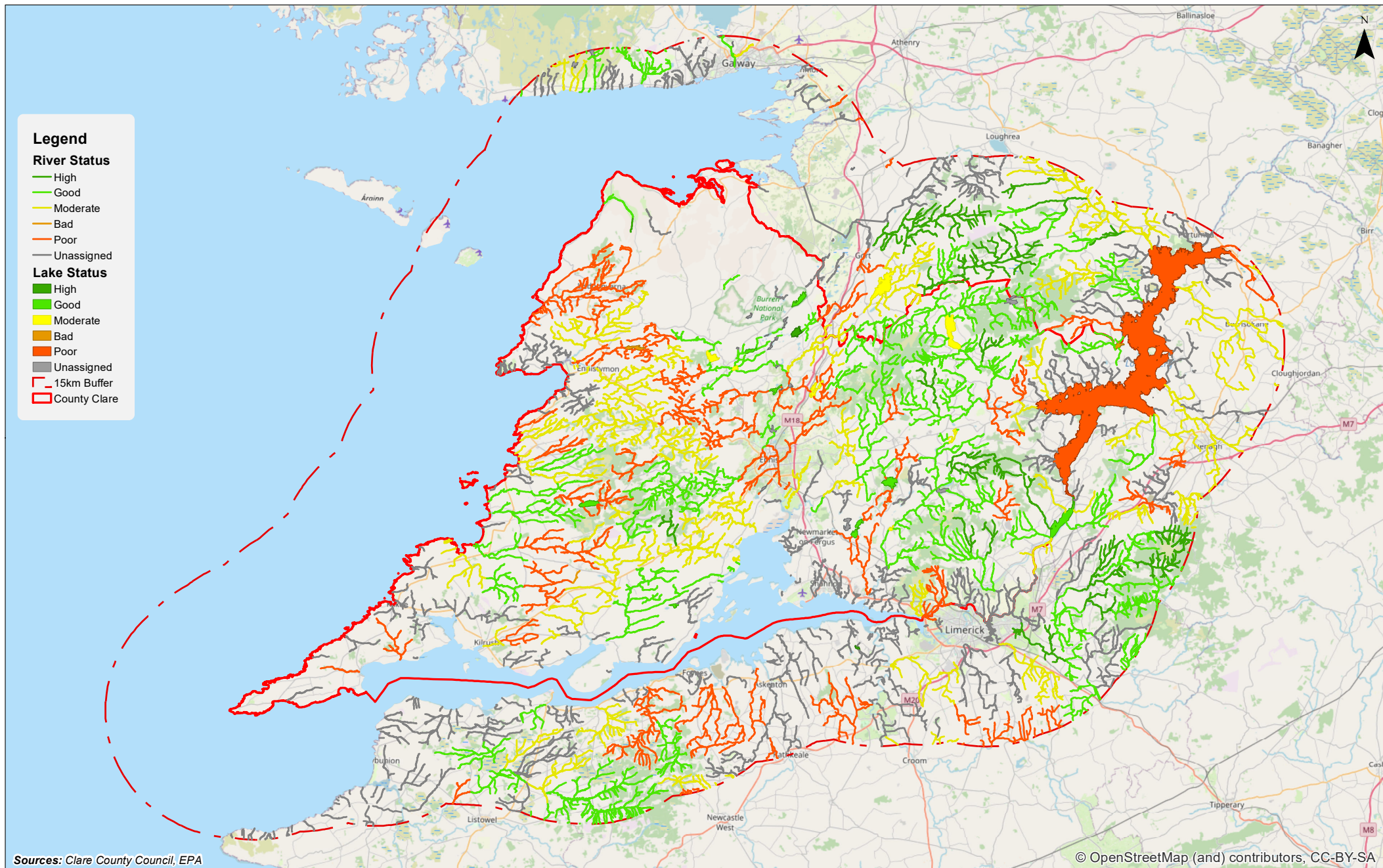
The three main challenges for water quality management are to eliminate serious pollution associated with point sources; to tackle diffuse pollution; and to use the full range of legislative measures in an integrated way to achieve better water quality. A key element of the Programme of Measures developed to achieve the objectives of the WFD is focused measures on rivers water bodies where monitoring has identified particular causes of pollution, which will help reduce pollutant loading to lakes and coastal waters as well as improving river quality

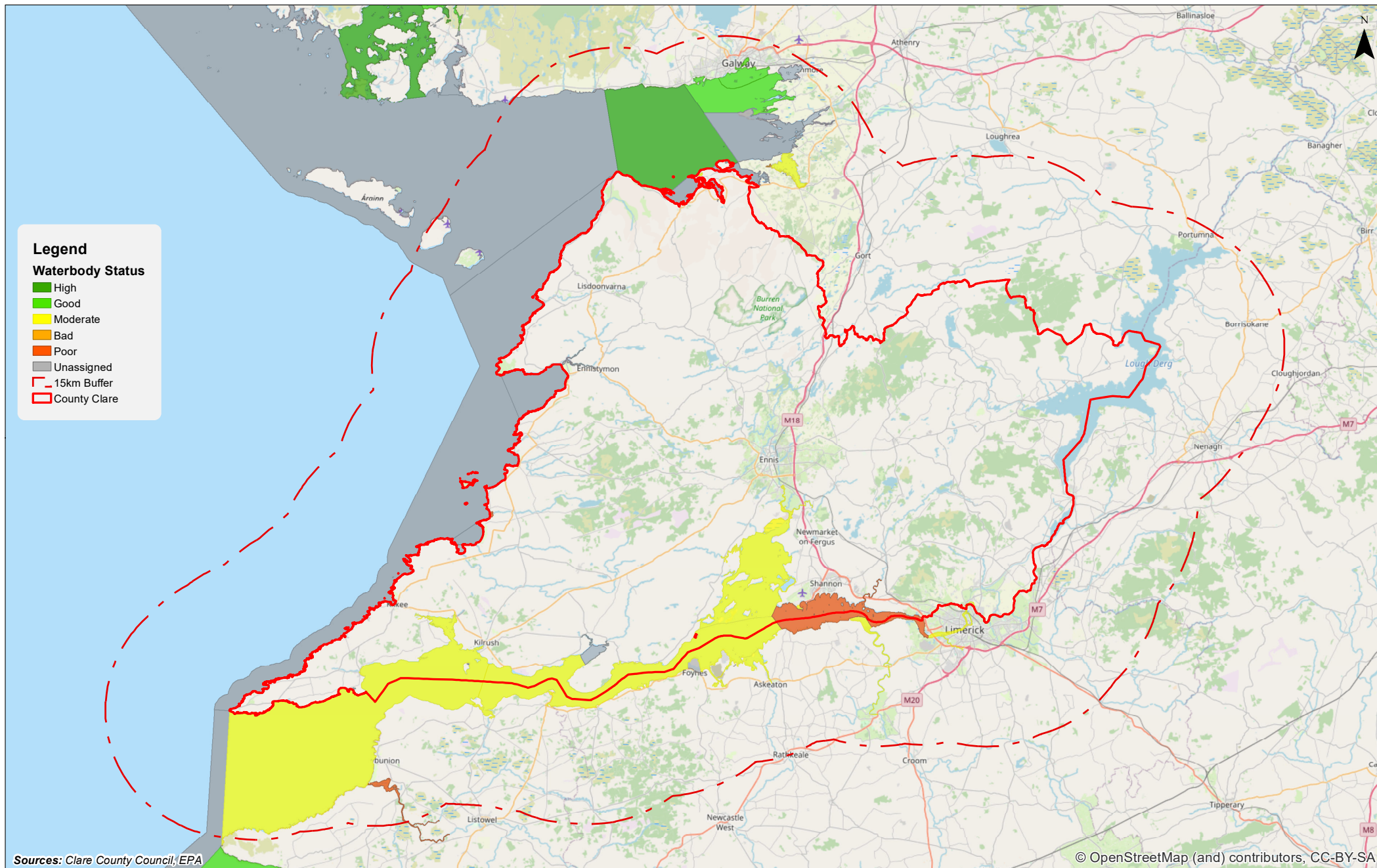
⁵¹ [https://www.epa.ie/pubs/reports/water/waterqua/Water%20Quality%20in%20Ireland%202013-2018%20\(web\).pdf](https://www.epa.ie/pubs/reports/water/waterqua/Water%20Quality%20in%20Ireland%202013-2018%20(web).pdf)

⁵² <https://data.gov.ie/dataset/high-status-objective-water-bodies>

⁵³ [https://www.epa.ie/pubs/reports/water/waterqua/Water%20Quality%20in%20Ireland%202013-2018%20\(web\).pdf#page=59](https://www.epa.ie/pubs/reports/water/waterqua/Water%20Quality%20in%20Ireland%202013-2018%20(web).pdf#page=59)







SEA AA and RES of Clare Co Dev Plan

Projection: IRENET95 Irish Transverse Mercator

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Date: 29/11/2021

Drawn: NR

Checked: IP

Approved: AG

Status: Final

Rev: F01

File Ref: CP20027Arc0032F01

5.10.6 Groundwater

Groundwater is defined as the water stored underground in formations of saturated rock, sand, gravel and soils. Surface and groundwater are inextricably linked therefore making it difficult to protect from contamination, particularly in such a vulnerable area as the Drumcliff and Pouladower Springs in Ennis and the large karstic areas of the Burren and West Clare. The protection of groundwater from human activity is crucial as the resource is highly susceptible to contamination with long-term consequences for humans and the environment.

The Geological Survey of Ireland (GSI) rates aquifers according to their vulnerability to pollution. Aquifer vulnerability refers to the ease with which pollutants of various kinds can enter underground water.

Figure 5.10-5 highlights areas of extreme to low vulnerability. A large area in the County is rated as being of Extreme (X) vulnerability- rock at or within 1m of the surface. In West Clare beyond a line running from Doonbeg to Kilrush and as far west as Cross the vulnerability is classified as Low with pockets of Extreme along the West Coast from Loop Head to Doonbeg. The characterisation of the bedrock aquifer from which the groundwater vulnerability rating partly derives is depicted in **Figure 5.10-4**.

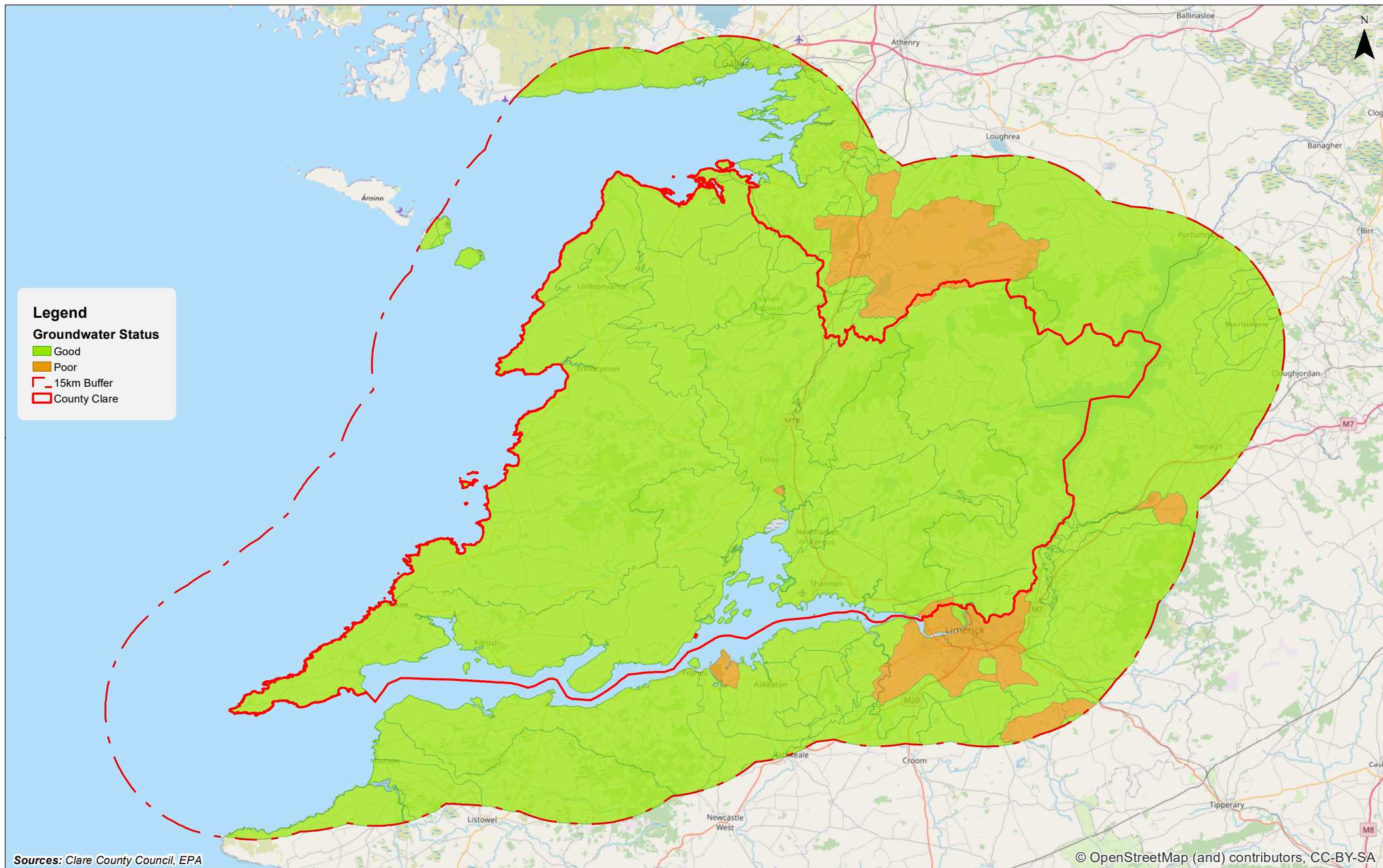
The GSI classifies aquifers and the classes are divided into three main groups based on their resource potential, and further subdivided based on the type of openings through which groundwater flows. There are nine aquifer categories in total. Regionally important (karstified - conduit) aquifers are generally located to the west of the country, in the Burren/East Galway area. Gravel aquifers are much smaller in number and extent, covering only about 1,221km² nationally. In County Clare the aquifer is classified by the GSI as "Locally Important" for the area from Ennistymon to Kilrush. It is classified as "Regionally Important Karstified-conduit" for the area extending from Ennis to North Clare. The Aquifer Classification and & Groundwater Source Protection Zones of County Clare are shown in **Figure 5.10-6**.

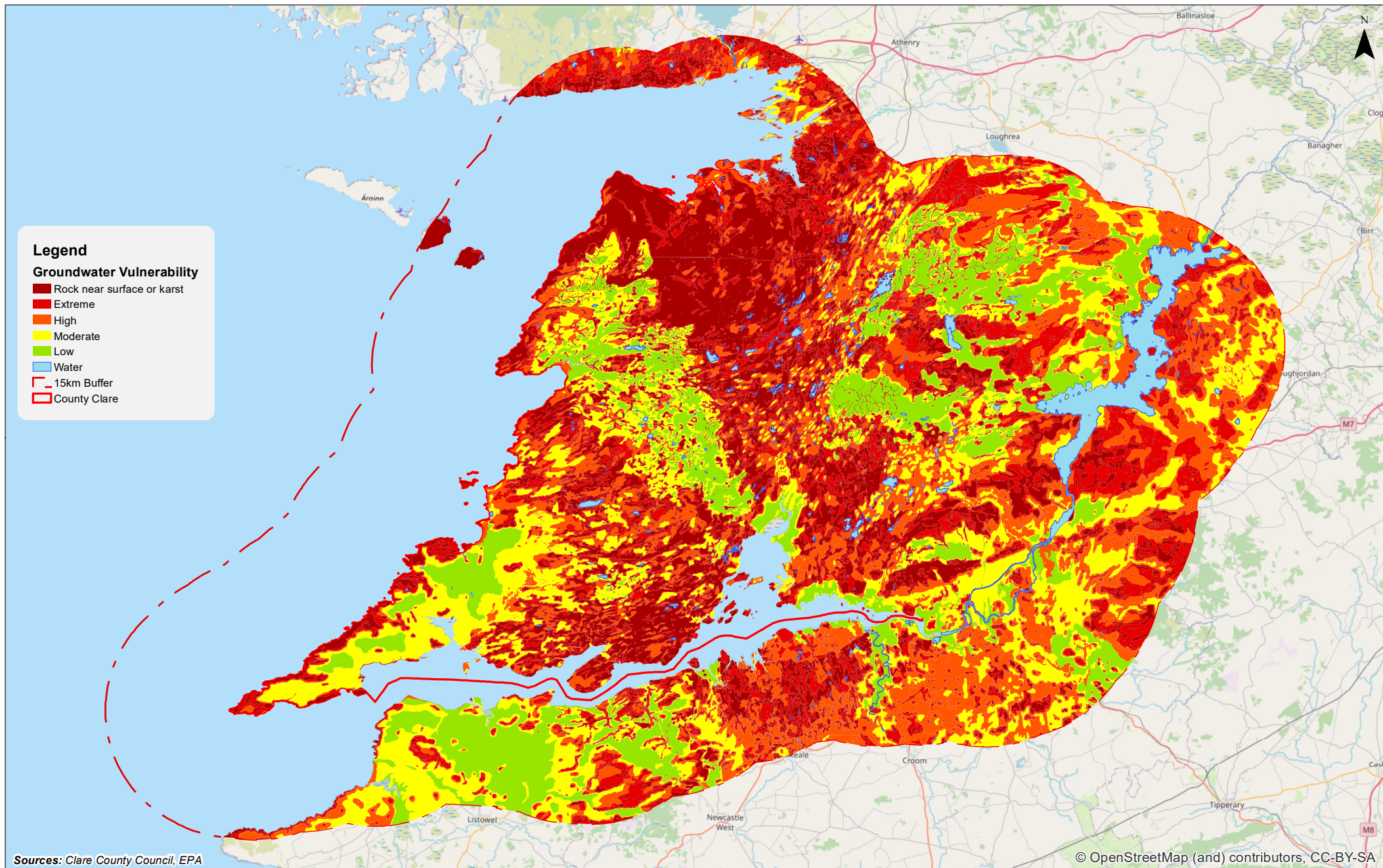
Karst features play an important role as conduits for water and pollutants and numerous karst landforms are mapped within the Regionally Important Karstic Aquifer of County Clare. Common karst features can include swallow holes, caves, turloughs and enclosed depressions. The distribution of known karst features is illustrated in **Figure 5.10-7**.

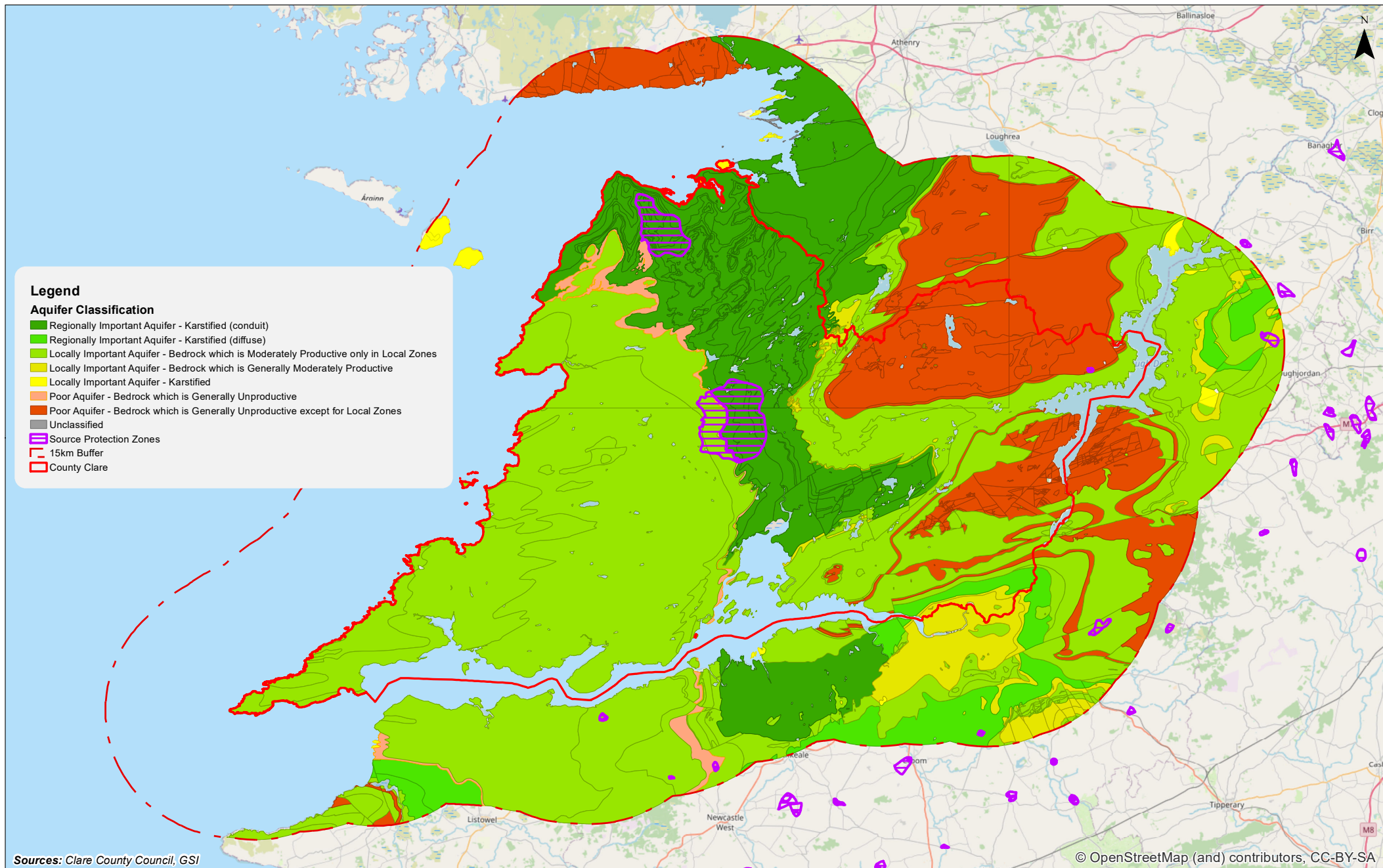
Figure 5.10-5 shows the WFD Ground Waterbody (GWB) status in County Clare. The Groundwater Body is the management unit under the Water Framework Directive. Overall the GWB's within the County are primarily of good status.

Potential pollution sources within groundwater protection zones include numerous small farms, together with illegal dumping, especially in dolines (enclosed depressions) and sinkholes in karstic areas. Much of the area has been developed with scattered rural housing with associated septic tanks. There are also a number of petrol stations within the catchment area, one of which is located close to swallow hole. Incidences of domestic oil tank leakages can also occur posing a potential pollution threat to groundwater.

The WFD groundwater monitoring programme for the assessment of groundwater chemical and quantitative status for 2013-2018 identified one Ground Waterbody in County Clare at poor status. The basis behind this classification is the presence of the Roche Ireland Industrial facility, an IPPC and IEL licensed facility.







SEA AA and RES of Clare Co Dev Plan

Projection: IRENET95 Irish Transverse
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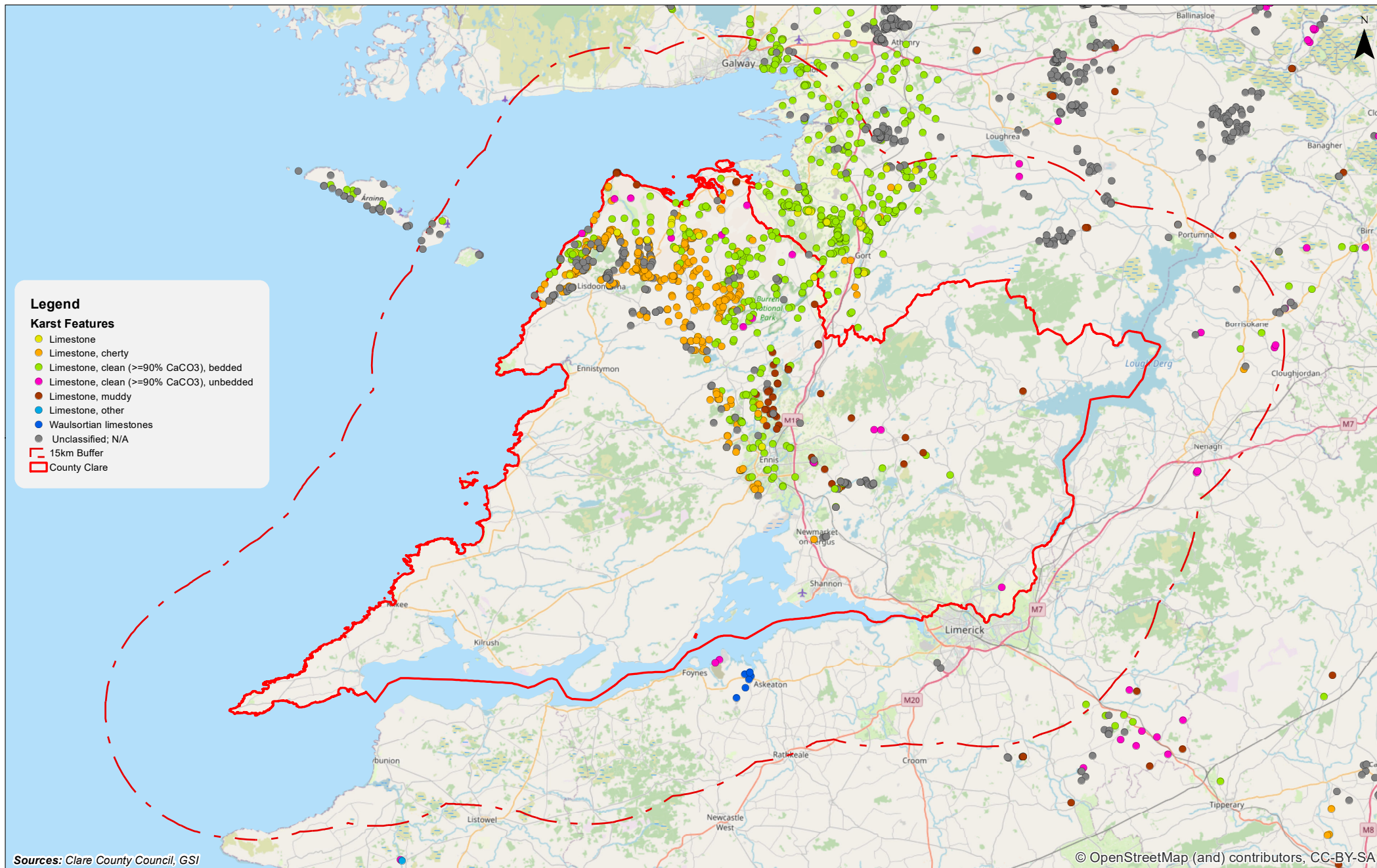
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Clare County
Council

Figure 5.10-6 Groundwater Aquifer Classification & Source Protection Zones





5.10.7 Protected Bathing Waters

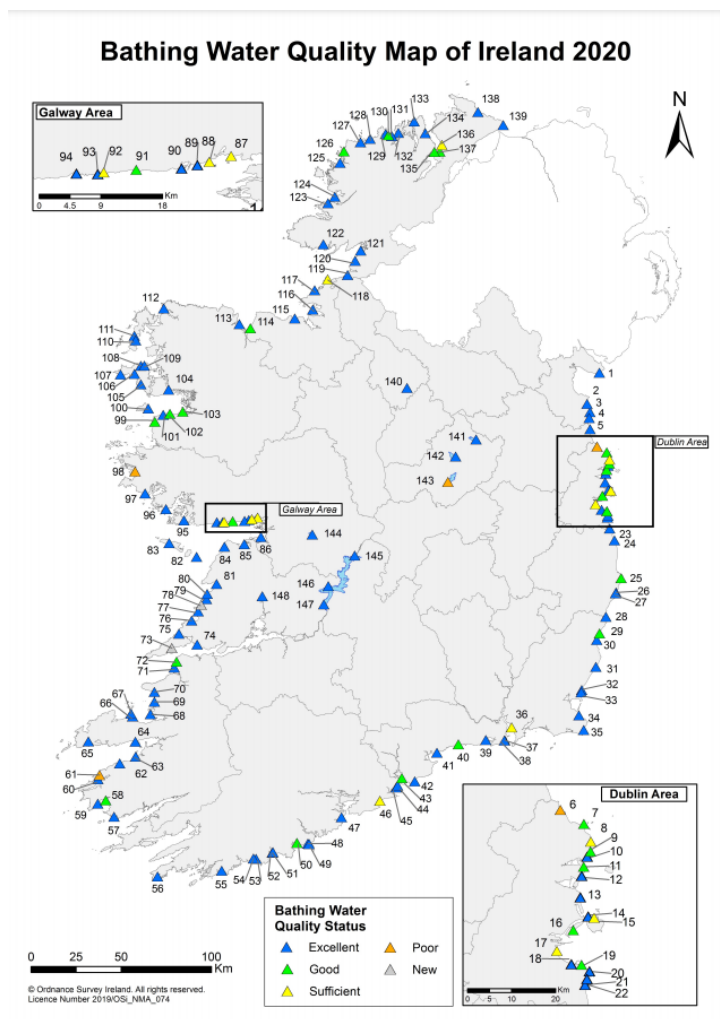
The legislation governing the quality of bathing waters is EU Directive (76/160/EEC), transposed into Irish law by the Quality of Bathing Waters Regulations, 1992 (SI No. 155 of 1992). A new Directive on bathing water (2006/7/EC) came into force in March 2006, transposed into Irish law by the Bathing Water Quality Regulations, 2008 (SI No. 79 of 2008), and will repeal the 1976 Directive with effect from 31 December 2014. The 2006 Directive establishes a new classification system for bathing waters (based on microbiological standards) and requires that a classification of at least 'sufficient' be achieved by 2015 for all bathing waters.

At present, *E. coli* and intestinal enterococci are used to classify bathing waters into four categories of 'Excellent', 'Good', 'Sufficient' and 'Poor' in accordance with the 2008 Regulations. These targets represent a further strengthening of measures to protect public health and amount to an almost two-fold decrease in the levels of microbiological contamination deemed to be acceptable for bathing waters. In addition to this tightening of standards a minimum target of 'Sufficient' will be required to be achieved for all bathing waters. County Clare now has 14 monitored bathing waters the most recent beach added in 2020, Carrigholts. Carrigholts water quality has not yet been assessed. The remaining 13 bathing waters were monitored and have all achieved excellent quality over the sampling period 2017 --2020 (Quality was a new monitored beach in 2017 and achieved excellent quality in 2018, 2019 and 2020).

All 14 designated Bathing Waters in County Clare are shown on a map from the EPA's Water quality in Ireland 2020 report.⁵⁴, as shown in **Figure 5.10-8**, have 'excellent' bathing water quality status.

⁵⁴<https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/bathing-water-quality-in-ireland-2020-.php>

Figure 5.10-8: Bathing Water Locations (Courtesy of EPA Water Quality Report 2020)



5.10.8 Climate Change and Water Quality and Quantity

The specific issues of climate change are difficult to predict, but it is likely that they will add to water quality management issues in the future, both in the areas of flood and drought management. Heavier winter rain storms give rise to flash flooding and land saturation, bringing more significant loads of diffuse pollution into the water bodies. Drought periods can give rise to low water levels and associated difficulties with adequate water quantity for abstraction, to serve the needs of the potable water supply areas.

5.10.9 Flooding

Flooding is a major issue in relation to County Clare, particularly over recent years and the issues of flood risk management; through mitigation and adaptation measures and developing overall resilience to climate change are of critical importance. A strategic approach to the management of flood risk is important in County Clare as the risks are varied and disparate, with scales of risk and scales of existing and proposed development varying greatly across the county.

Following the Planning Guidelines, development should always be located in areas of lowest flood risk first, and only when it has been established that there are no suitable alternative options should development (of the lowest vulnerability) proceed. Consideration may then be given to factors which moderate risks, such as defences, and finally consideration of suitable flood risk mitigation and site management measures is necessary.

It is important to note that whilst it may be technically feasible to mitigate or manage flood risk at site level, strategically it may not be a sustainable approach.

Flooding can be exacerbated by development through removal of flood plain and therefore flood storage, by altering watercourses and increasing surface water run-off. Flooding can also pose a threat of water contamination due to inundation of waste water treatment systems, agricultural run-off and surface water run-off from developments.

Catchment Flood Risk Assessment and Management (CFRAM) Studies have been undertaken and Flood Risk Management Plans (FRMPs) have been prepared in line with the European Directive 2007/60/EC (Floods Directive). It requires member states to carry out preliminary flood assessments in order to identify areas of potentially significant flood risk, or Areas for Further Assessment (AFA).

The OPW published in early 2018 individual FRMP for each of the 29 River Basins assessed as being at potentially at significant risk of flooding. The FRMP relevant to County Clare is the Shannon Estuary North & Mal Bay River Basin. Areas of Further Assessment (AFAs) within the County include Ennis, Shannon, Kilrush and Kilkee.

Each CFRAM Study has produced flood maps and flood risk management objectives. The CFRAM programme is central to the medium to long-term strategy for the reduction and management of flood risk in Ireland. Flood extent mapping for fluvial, pluvial and coastal flooding is available on the OPW's dedicated flood map viewer.⁵⁵ River Flood Extents and Past Flood Events within County Clare are shown in **Figure 5.10-9**.

Requirements for a Flood Risk Assessment

In 2009 the OPW's '*The Planning System and Flood Risk Management Guidelines for Planning Authorities*' was published which ensures that flood risk assessment and management is incorporated within the planning system and is of relevance for development occurring at or near the coast. In relation to flooding, it is important to ensure the resilience of any RE infrastructure or development (which may include windfarms, solar farms etc) to the effects of climate change, including flood protection of assets, and ensure that sectoral activities do not increase flood risk of other development located downstream within a catchment.

The Strategic Flood Risk Assessment accompanying the CCDP will assist in identifying appropriate areas for RE development. Flood alleviation works that have been undertaken and are in the pipeline will aid in the management of flood waters in protecting the main settlement areas within the county.

⁵⁵ OPW Flood Maps Viewer: <https://www.floodinfo.ie/map/floodmaps/>

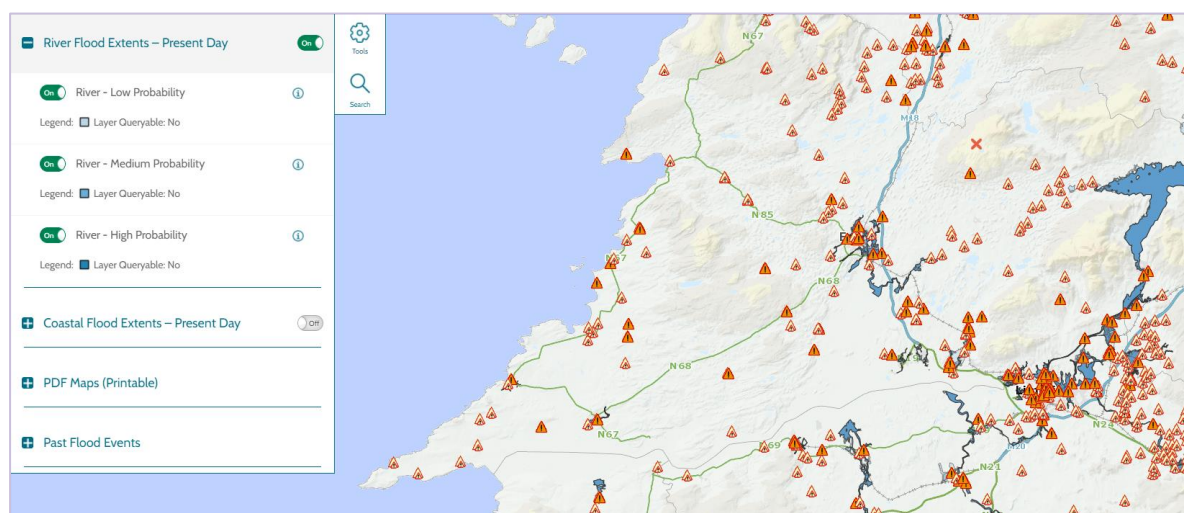
An appropriately detailed flood risk assessment will be required in support of any planning application for RE development. The level of detail will vary depending on the risks identified and the proposed land use. As a minimum, all proposed development, including that in Flood Zone C, must consider the impact of surface water flood risks on drainage design. In addition, flood risk from sources other than fluvial and tidal should be reviewed.

For sites within Flood Zone A or B, a site specific "Stage 2 - Initial FRA" will be required, and may need to be developed into a "Stage 3 - Detailed FRA". The extents of Flood Zone A and B are delineated through this SFRA. However, future studies may refine the extents (either to reduce or enlarge them) so a comprehensive review of available data should be undertaken once an FRA has been triggered.

Within the FRA the impacts of climate change and residual risk (including culvert/structure blockage) should be considered and remodelled where necessary, using an appropriate level of detail, in the design of finished floor levels. Further information on the required content of the FRA is provided in the Planning System and Flood Risk Management Guidelines.

Any proposal that is considered acceptable in principle shall demonstrate the use of the sequential approach in terms of the site layout and design and, in satisfying the Justification Test (where required), the proposal will demonstrate that appropriate mitigation and management measures are put in place.

Figure 5.10-9: River Flood Extents and Past Flood Events within County Clare



5.10.10 Water Conservation

Clean potable water is an important resource that must be protected and conserved. Slightly lower than the national average of 42%⁵⁶ it is estimated that 37%⁵⁷ of the water supplied in County Clare is lost as a result of leakage as well as illegal use of water. The Ennis Water Supply Scheme has one of the highest levels of water leakage in Co. Clare. The production and treatment of the supply of water must be managed in a sustainable manner. In line with national policy and priorities of Irish Water's National Leakage Reduction programme, the Local Authority will comply with the requirement to measure water flow in specific areas of the network to identify the levels of leakage and to assist in the objective to conserve water.

⁵⁶ <https://www.cru.ie/wp-content/uploads/2020/08/CRU20089-Energy-and-Water-Monitoring-Report-for-2019.pdf>

⁵⁷ Figure collated by the National Oversight and Audit Commission, 2015

5.10.11 Issues and Threats

Ireland has seen continuing decline in high status water bodies and an increase in the number of water bodies in poor ecological health. The EPA State of the Environment Report 2020 notes that almost half of Ireland's surface water bodies (river, lake, transitional and coastal) are failing to meet their objectives under the WFD. For the water quality reporting period 2013-2018, just over half of Ireland's water bodies (53%) were at Good or High status ecological status.

An understanding of the significant pressures these water bodies are under and interaction with any marine/land based renewable energy projects is critical.

There continues to be a decline in the number of water bodies reaching or maintaining High ecological status, with only 20 sites reaching Q5 status compared to 500 thirty years ago, and an increase in the number of the most polluted water bodies.

In terms of chemical status in surface waters, while some ubiquitous priority substances (e.g., hydrocarbons) continue to be present in some water bodies, use of herbicides is widespread. Three-quarters of surface water bodies assessed for chemical status over the 2013-2018 period had Good chemical status. The majority of groundwaters (92%) have Good chemical status, and 99% have Good quantitative status i.e. rainfall replenishment of groundwater is generally able to sustainably support current abstraction volumes. The Cycle 2 RBMP flagged 6% of groundwater bodies as requiring further assessment for abstraction pressures.

The key pressures on water bodies continues to be agriculture (nutrient run-off and sediment, point pressures such as farmyards), followed by hydromorphological issues (e.g. land drainage, channelisation), urban wastewater discharges and forestry, as well as other pressures. The key nutrients pressures are from phosphorus (the dominant nutrient of concern for surface waters) and nitrate (a particular problem in the south and south-east, as well as for groundwaters). Invasive or alien species remain a problem.

The significant pressures for river and lake water bodies within County Clare include⁵⁸;

- Agriculture
- Anthropogenic (include nutrient, chemical, microbiological, organic and sediment pollution.
- Domestic waste water
- Forestry
- Hydromorphology
- Industry
- Urban runoff
- Urban waste water
- Abstraction
- Invasive species

Aquifer vulnerability is Extreme in large areas of the County which will require consideration during construction stage of any renewable energy infrastructure. Large areas of the county are classified as a Regionally Important Aquifer meaning a dependence on groundwater as a supply therefore the potential to impact on groundwater supplies and the limitations in terms of development in proximity to groundwater source protection zones will require consideration.

Karstification is widespread in the northwest of the County, infrastructure development will require careful avoidance and consideration of both known and unknown karst features in terms of potential collapse and the possibility for karst features to become conduits for pollutants to enter.

The provision of a good quality water supply is a critical requirement for attracting investment in renewable energy technology. The volume of water lost through leakages in pipe infrastructure is not

⁵⁸ 2nd Cycle significant pressures, data available via catchments.ie mapping

only a local or county level issue but a county wide issue. While a significant pipe rehabilitation programme is underway through Irish Water's National Leakage Reduction Programme, further education and information on water conservation and usage for water users is needed.

The significant pressures for ground water bodies within County Clare include;

- Agricultural
- Anthropogenic

For the Marine environment the key drivers of pressures and impacts arise from anthropogenic sources such as litter, climate change, noise and pollution events. Ocean warming and acidification are driven mainly by climate change. These pressures can exacerbate other issues such as impacting native biodiversity, facilitating expansion or spread of invasive or opportunistic species. Increased flows in rivers could also facilitate increased nutrient transport to the marine environment, combined with climate change, are expected to increase the risk of algal blooms.

Marine litter affects ocean life and pollutes beaches, the water column and the seafloor. Dredging and dumping at sea is required for maintaining ports and navigational channels and is a licensable activity in Irish waters. Underwater noise is also increasing globally and related primarily to human activities (e.g. for drilling, extraction, navigation and data imaging purposes). Marine life is often sensitive to noise impacts, particularly whales and dolphins. Seaweed harvesting is another human activity which may impact on coastal biodiversity, particularly where large-scale commercial activity takes place.

Commercial fisheries and aquaculture also place pressure on the marine environment through overfishing/discards of target species and bycatch of non-target species, disruption/destruction of habitats and species from trawling and dredging. Discharges of waste from fish farms is another issue, as is introduction of non-native species or pharmaceuticals for parasite control/anti-fouling agents. Escaped farmed species for instance may impact on the genetic integrity of wild stocks, and there are also landscape/seascape impacts from aquaculture gear. Irish fish stocks have declined due to overfishing and disturbance. Key aspects such as the locations/use of some nursery habitat/feeding areas remains poorly understood; 34 stocks (18%) achieved GES, 44 (22%) did not, with the status of 99 stocks unknown. Disturbance and impacts to seafloor habitats (e.g. from bottom trawl fishing gear) are widespread in Ireland's continental shelf area (46% of the assessed area is highly disturbed), but not all of the maritime area has been assessed.

The significant pressures for transitional water bodies within County Clare include;

- Anthropogenic;
- Agriculture; and
- Hydromorphology.

5.10.12 What would happen to the water resource without implementation of the RES?

The eleven existing directives outlined under Article 11 of the WFD would continue to be implemented and enforced for the third cycle of the River Basin Management Plan (RBMP) covering the period 2022-2027, also taking account of the most recent status of water bodies, the outputs of the risk characterisation process as well as the lessons learned from the implementation of the first and second cycle. The Irish Water Business Plan, Water Services Strategic Plan and National Water Resources Plan, would take place independently of the RES with the expected investment resulting in the provision of new or upgraded plants in 105 agglomerations, leading to some improvements in some water bodies. The existing planning system will need to account for water quality and refer to the programme of measures implemented through the RBMP.

However without the RES, water quality is likely to deteriorate due to unplanned development and lack of protection from policies. There is a legislative requirement under the WFD to achieve good status of all water bodies. While efforts to achieve this would continue in the absence of the RES, the RES will aim to ensure that the use of and mitigation measures for such waters are given due regard in the development of renewable energy resources.

5.10.135 Data Gaps/Problems

The water quality baseline data is broad. Problem areas will be defined more specifically if more water quality testing locations were introduced across the county. Water Quality Records are continually being monitored. The most up to date information has been utilised but it is accepted this may change during the Plan making process and will be updated accordingly.

5.11 Material Assets (MA)

5.11.1 Introduction

Material assets are defined as the critical infrastructure essential for the functioning of society such as water supply, wastewater treatment, transportation, etc. This section will address the following:

1. Transportation
2. Waste Management
3. Water Supply
4. Wastewater Treatment Infrastructure
5. Renewable and alternative energy

5.11.2 Transportation

Access to an efficient transport network contributes to opportunities for all sectors of the population to access services, facilities and social networks that are necessary to meet daily needs. Ease of accessibility enhances quality of life, promotes social inclusion, presents opportunities and promotes human health through expansion of cycle and walking infrastructure.

Road Network

The road network in the county is made up of motorway, national primary roads, and national secondary roads, regional and local roads. County Clare has a large rural area with a dispersed population with the result that the car is the predominant mode of transport. The maintenance and upgrade of the existing road network and, where necessary, the provision of new road networks or realignments are essential to achieve modern high standards.

The existing main roads include; the M18 motorway which by-passes Ennis, connects the town to the national motorway network and two National Primary Routes, the N18 Galway-Limerick motorway and the N19 which starts at Shannon Airport and leads on to the N18. (See **Figure 5.11.1**). The National Secondary roads include the N85 Ennis-Lahinch, N67 Killimer-Ballyvaughan and the N68 Ennis to Kilrush routes.

The M18 has much improved road connectivity nationally, reducing travel times significantly to Dublin, Cork, Limerick and Galway, with the section of the M18 between Gort and Galway. It has also contributed to a significant benefit in reduced local travel patterns to places of employment, including Shannon. The Limerick Northern Distributor Road (LNDR) is a policy objective of both Local Clare and Limerick Local Authorities, supported most recently by its inclusion as a *National Enabler* in the adopted RSES. Historically, the need for the Scheme was identified in the Limerick Planning, Land Use and Transport Study. Phase 1 of the LNDR from Coonagh to Knockalisheen is currently under construction.

Bus Network

Bus Eireann operates regular services from their centrally located newly refurbished bus station to Shannon Airport, Galway, Limerick, Cork and Dublin. Private operator, Dublin Coach also operate several (up to 25 during peak times) daily express services between Ennis, Limerick, Kildare and Dublin. Bus Eireann also provides an infrequent service from Ennis to north and west Clare and a regular service to Shannon Airport.

Local Services are provided for by Clare Bus, a not-for-profit bus service, which has a large number of routes that connect Ennis with its extensive rural hinterland. The services provided are designed to support communities and increase transport options at a local level while opening up access to the national transport network. The route schedules connect with national transport links provided by Bus Eireann, Dublin Coach and Irish Rail in Ennis.

Transport for Ireland (TFI) Local Link Limerick Clare has expanded its services in Clare, including the first rural regular services that will run five to seven days a week. The service was launched in March

2021 with the new Local Link route 337 showcasing the Shannon Estuary Way serving Labasheeda, Kildysart, Ballynacally, Kilmurry McMahon, Knock, Killimer, the ferry terminal, and world famous fishing sites three times a day from Monday to Saturday with a reduced timetable on Sundays.

Local Link will provide access to these areas for staycations and tourists as well as facilitating local resident's transportation needs, providing connectivity between Kilrush and Ennis. The need for the expansion of Local Link services was voiced by the local communities, community groups, Clare County Council and Elected Representatives during a period of public consultation in February 2020.

Working with the NTA's Connecting Ireland Team, Local Link Limerick Clare focused on merging the Bus Éireann rural services in Clare that were reconfigured under the July Stimulus, and enhancing the services to meet the needs identified by those who took part in the public consultation.

Rail Network

The rail services within County Clare consist of a branch off the Limerick line which serves Ennis. The Draft Limerick Shannon Metropolitan Area Transport Strategy promotes an integrated transport strategy for walking, cycling, bus, rail and road to support planned growth up to 2040. The Western Rail Corridor underwent significant upgrades with 36 miles of track and associated infrastructure, as well as the provision of five stations at Gort, Ardahan, Craughwell, Sixmilebridge and Oranmore. Ennis is situated on the western rail corridor which has undergone substantial investment over recent years. Ennis rail and bus station is located within walking distance of the town centre of Ennis. There are park and ride facilities at the station. The regular routes serviced from Ennis include a Limerick/Dublin service, Limerick/Cork/Tralee and Galway/Limerick services. There is no rail line serving Shannon, with the closest station located in Sixmilebridge, approximately 6km east of Shannon town centre. Bus route 343 operated by Bus Éireann provides an infrequent connection between Shannon Town Centre and Sixmilebridge station. It is noted that the Shannon Town and Environs Local Area Plan includes an objective to link Shannon with Sixmilebridge station via a direct shuttle bus in the short-term. The draft LSMATS indicates that connectivity to Shannon will be significantly improved over the lifetime of the Strategy with existing bus services being enhanced with some new additional services, including the better linking of Sixmilebridge Train station to Shannon Airport together with exploring the potential for a new rail line spur to Shannon Town and Shannon Airport. At present, flooding frequently closes the Limerick-Ennis line at Ballycar causing severe disruption to the LSMA Rail Network. Iarnród Éireann are currently investigating a technical solution to alleviate this flooding. In line with Objective RL8 of the Draft LSMATS the Clare County Development Plan supports the intention of the NTA and the local authorities to work in collaboration with Iarnród Éireann and other relevant stakeholders to resolve the localised flooding issue on the Limerick-Ennis line at Ballycar.

Air

Shannon Airport is located within the southern part of the county. It is a critical element of the transport network in the region with both a national and international role. It is strategically located between Limerick and Galway with capacity to serve an increased market to the west should future development take place in the Shannon Estuary which requires air transport. The Airport boasts the longest runway in Ireland, at 3,199 metres in length, 45 metres wide and in operation 24 hours per day, 365 days per year with 24 stands. The Airport has both scheduled and chartered flights to a range of destinations and has 30 aircraft stands. Passenger numbers in 2017 was 1.75 million but existing infrastructure at Shannon has the capacity to deal with 4.5 million passengers without additional investment. The RSES for the Southern Region identifies Shannon International Airport as an International Gateway to the West of Ireland with an ambition to increase connectivity and create a rail link between Limerick City and Shannon International Airport. The 2017-2023 CDP contained an infrastructural safeguard for a rail line to be provided to Shannon town and International Airport and is also supported and promoted within the new CDP 2023-2029. In addition, prioritisation must be given to progressing improvements and upgrades to the existing N19 road access from the motorway to Shannon International Airport. Aviation is vital to the future business of the county in terms of tourism and trade and connectivity between airports and public transport together with key nodal points within the county is a key element of this. There is an opportunity to expand the international offering at Shannon Airport through linkages with Cruise Shannon Estuary. In support of the development of the Shannon Estuary as a cruise destination, *Cruise Shannon Estuary* is an initiative led by Shannon Foynes Port Company and supported by Kerry County Council, Limerick City and County Council and Clare County Council. Shannon Foynes Port Company is committed to growing this industry and establishing the Port as one of the top destinations for cruise liners in Europe. Cruise Shannon

Estuary will attract expedition cruise ships which will be provided with the opportunity to tender passengers to Cahiracon Pier offering a unique experience for its passengers to experience the Clare Coastline first hand and to further explore the county from this unique landing point. A feasibility study is currently being prepared in order to establish the requirements of ensuring Cahiracon Pier is ready to accept tourists in 2022. Through ensuring strong connectivity from Shannon International Airport by road and rail there is an opportunity to offer Shannon Airport as a start and finishing point to the cruise sector linking by road to Cahiracon or Foynes.

5.11.3 Climate Change and Transportation

Transportation networks will increasingly need to adapt to cope with effects of a changing climate evidenced by an increase in incidences of flooding and high temperatures resulting in droughts, both attributable to a recognised trend of an increase in extreme weather events. Resilience to these changes needs to be integrated into future and existing networks and services in order to maintain an efficient transportation network. This could materialise in a number of ways, for example, by improving cooling and heating systems within vehicles; provide adequate surface water attenuation ponds to cope with increased levels of surface water as result of increased rainfall; integrate and plan provision of alternative service route options for public and private transport networks where areas are known to experience flooding.

5.11.4 Waste Management

Clare currently falls under the Southern Region Waste Management Plan (2015-2021) area for which the management plan was published in May 2015. Within the County Development Plan Area there are a range of waste recycling facilities which include 5 recycling centres and transfer stations as follows:

- Central Waste Management Facility, Inagh
- Ennis Recycling Centre, Ennis
- Lisdeen Recycling Centre and Transfer Station, Kilkee
- Scarriff Recycling Centre and transfer station, Scarriff
- Shannon Recycling Centre

Cork County Council has been appointed Lead Authority for Waste Domestic and commercial waste collection is undertaken solely by private permitted collectors, which include waste separation to aid waste recycling. There is an extensive education and awareness programme of waste prevention initiatives in order to minimise waste going to landfill.

Enforcement in the Southern Region in 2015. The Southern Region extends from Counties Kerry and Clare on the west coast to County Wexford on the east coast, and includes the Counties of Cork, Limerick, Tipperary, Waterford, Carlow and Kilkenny and includes Cork City. Cork County Council will now take on the responsibility of co-ordinating and overseeing the enforcement of waste regulation on behalf of all 10 local authorities in this large region thereby ensuring a consistent and equitable approach is taken to providing a "level playing field" for all stakeholders in the industry. Following the publication in 2012 of "Putting People First" government policy has been moving towards the delivery of certain public services on a regional basis. The Regional Framework recognises 3 no. regions, Southern Region, Connaught/Ulster Region, and the East/Midlands Region. Government waste policy as outlined in "A Resource Opportunity" 2012 recognises that to protect Ireland's environment and the health of its citizens, a consistent and effective approach to enforcement of the regulatory framework is required.

Since the development of the three regional waste authorities the Government published the Waste Action Plan for a Circular Economy in September 2020. This new national waste policy provides direction for waste planning and management over the coming years. The previous national waste policy A Resource Opportunity (2102) focused on the delivery of national and EU targets while the new policy acknowledges the need to embed climate action in all strands of public policy.

Whilst the three Regional Waste Management Planning Lead Authorities will remain in place, they are now proceeding with the preparation of a replacement combined National Waste Management Plan for a Circular Economy. The NMWP will translate policy measures into meaningful actions and will

contain over 200 measures across various waste areas including the circular economy, municipal waste, consumer protection / citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

5.11.5 Water Services Infrastructure

The responsibility for the provision and management of water services (water supply and wastewater but excluding storm/surface water other than where sewage has been combined with surface water) was transferred to Irish Water on the first of January 2014. Whilst Clare County Council no longer has a remit in the management and provision of water and wastewater infrastructure, this development plan sets out the water services infrastructure priorities for residents, business and stakeholders in Clare. Irish Water is responsible for the provision of public water supply, wastewater collection and treatment services. It is an objective of Irish Water to provide both drinking water and wastewater capacity to support national, regional and local economic and spatial planning policy (subject to the constraints of the Irish Water Capital Investment Plan). Clare County Council retains its role in facilitating the provision of adequate water services, in conjunction with Irish Water, at a local level, through Service Level Agreements (SLAs).

National and Regional Policy

Since the publication of the 2017-2023 County Development Plan planning policy and direction provided in the National Planning Framework and the recently adopted Southern Regional Spatial and Economic Strategy has changed the policy direction in relation to the sustainable management of water supply and wastewater needs. The focus therefore by Irish Water in line with RPO 209 of the RSES for the Southern Region is to support investment and the sustainable development of strategic water supply projects together with RPO 2011 and 212 with respect to waste water where the focus is on supporting investment and the sustainable development of strategic wastewater treatment facilities in line with the IW Investment Plan. Given the rural nature of County Clare and the key focus of the draft CDP 2023-2029 to allow for compact, sustainable growth rural wastewater treatment is a key concern. RPO 213 provides an objective to “... *support investment in the sustainable development of rural wastewater treatment programmes and supports the initiatives of Irish Water, local authorities, communities and developers in small rural settlements to identify **sustainable solutions** subject to available funding for such services...*”. This objective will be key in allowing the sustainable development of our small towns and villages.

The 7 designated ‘Small Towns’ in County Clare are Kilkee, Killaloe, Lisdoonvarna, Miltown Malbay, Newmarket-on-Fergus, Sixmilebridge and Tulla and these towns are of fundamental importance as employment and tourist centres and for the provision of services and facilities for their resident populations and their rural hinterlands. The strategy within the draft CDP for these settlements is to ensure that their existing roles are maintained and further strengthened through measures such as the adequate zoning of lands for development, supporting the concept of settlement networks, seeking investment to regenerate and rejuvenate these settlements, supporting and working with the relevant bodies towards the development of the required ancillary infrastructure (including innovative solutions for wastewater treatment), and the adoption of a facilitatory approach towards appropriately-scaled and designed urban development.

It is recognised that some of these towns have not been in a position to fulfil this role due to deficiencies in water and wastewater services.

The draft CDP recognises that the Small Villages of County Clare (i.e. 39 are included in the Settlement Hierarchy) have a predominantly rural character with some public/community services such as a church, school, shop, etc. Their attractive character and community infrastructure, provide opportunities for ‘sites for independent development’ and low density ‘cluster’ style residential developments to act as viable alternatives to single housing in the countryside (subject to appropriate innovative design solutions for the treatment of wastewater) and the Council will seek investment through funds such as “New Homes in Small Towns and Villages” in this regard. In addition to small-scale, incremental residential growth appropriate commercial or employment-generating developments that are of a scale and nature that is sympathetic to the existing village will also be encouraged in the draft CDP and both residential and commercial growth in these settlements will be monitored over the CDP period.

Water Supply

In general, there is sufficient water supply treatment capacity in the county to meet the needs of the target population identified in the core strategies (See **Figure 5.11.2** for the geographical locations of the 23 Water Treatment Plants in Clare). Many of the water treatment plants supply water to a number of settlements in a “Water Supply Zone”(WSZ) and WSZs may be linked together to form a water resource zone. County Clare is supplied by 16 water resource zones (WRZs). As part of the National Water Resource Plan it has been assessed that it is unlikely that there will be any issues facilitating new connections in the following WRZs: Killaloe, Corofin, Kilkeedy and Feakle water supplies, although further investigative studies or interventions may be required in some instances. The NWRP has determined that the following WRZs may require further investigative studies or interventions to facilitate significant new connections to the network:

- West Clare
- Ennistymon
- Ennis
- Turlough
- Ennis/Shannon/Sixmilebridge
- O'Brien's Bridge PWS
- Kiladysert PWS
- Flagmount PWS
- Carron PWS
- Scarriff PWS
- Mountshannon PWS

It is Irish Waters objective to interlink WSZs, where appropriate, to increase the resilience (reliability) of the water supply system. Network reinforcement is likely to be required to ensure that water supply can be moved around the network to where it is needed. In addition, many of the water treatment plants in the county need upgrading in order to ensure that water is produced to the required standards as set out in the relevant Drinking Water Regulations. According to Irish Water the full options assessment stage of the NWRP is currently progressing in consultation with the water services department of Clare County Council. This will identify the preferred interim and long-term interventions required to ensure a sustainable water supply in Co. Clare, and nationally.

The emerging preferred approach for the Ennis/Shannon/Sixmilebridge WRZ under the NWRP full options assessment is to connect to Limerick City WRZ. However, in the short-term, potential improvements at Crean and Castle Lake WTPs may be required to facilitate growth: these are currently under investigation. Water treatment plant upgrades are due to commence in the Corofin, Ennistymon and West Clare WRZs in 2021.

Water Safety Plans

A Water safety plan is a plan to ensure the safety of drinking water through the use of a comprehensive risk assessment and risk management approach that encompasses all steps in water supply from catchment management, the treatment plant and through to the consumers tap. The principles and concepts of risk management are used and then a multi-barrier approach to reduce the risk is put in place.

Water Supply and Climate Change

The onset of climate change and predicted change in weather patterns, culminating in an increase in dry spells of weather and of rain surges, have potential implications on water supply. Already the water supply sources within the county come under strain during more prolonged spells of dry weather, which are set to increase in years to come. The summer of 2018 was officially classed as a drought by Met Éireann. The prolonged dry warm spell caused significant issues with water supply and in the agricultural sector. The demand on the major water supply schemes increased significantly while schemes serviced by groundwater supplies had to be augmented by tankers as ground water

levels across the region plummeted. Additional deeper wells were drilled to try and supplement supply. Landscape and Development planning will need to take into account Climate Change predictions which will influence decision making around planning in the context of water. In Clare it is predicted that drought conditions will increase particularly in the summer months requiring more emphasis on the protection of landscape hydrology and important aquifers. Integration of Nature Based solutions including integrated catchment management incorporating land use sensitivity mapping and sustainable urban drainage systems will support good planning and mitigation measures where required.

Measures need to be put in place to adapt to predicted weather changes in terms of ensuring an adequate supply of clean water to the existing and future population of the plan area.

Wastewater Treatment

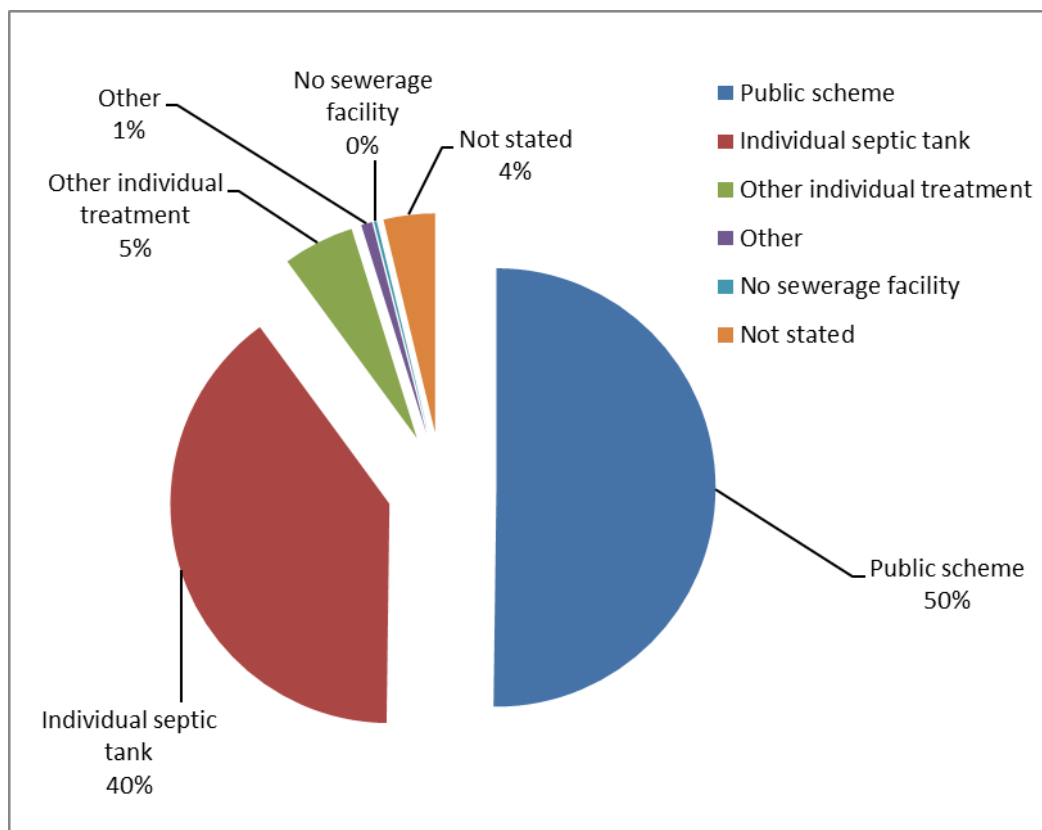
The Urban Wastewater Treatment Directive (91/271/EEC, amended by Directive 98/15/EEC) aims to protect the environment from the adverse effects of wastewater discharges by ensuring that wastewater is appropriately treated before it is discharged to the environment. Such treatment is essential in order to meet the requirements of the WFD.

Wastewater within the county is treated either through wastewater treatment plants (48%) or individual septic tank units (44%). Many of the buildings which are located outside of the larger towns and villages are not connected to the public wastewater disposal system, and the effluent must be treated by individual proprietary wastewater treatment plants and septic tanks. There are 31 urban wastewater treatment plants in County Clare.

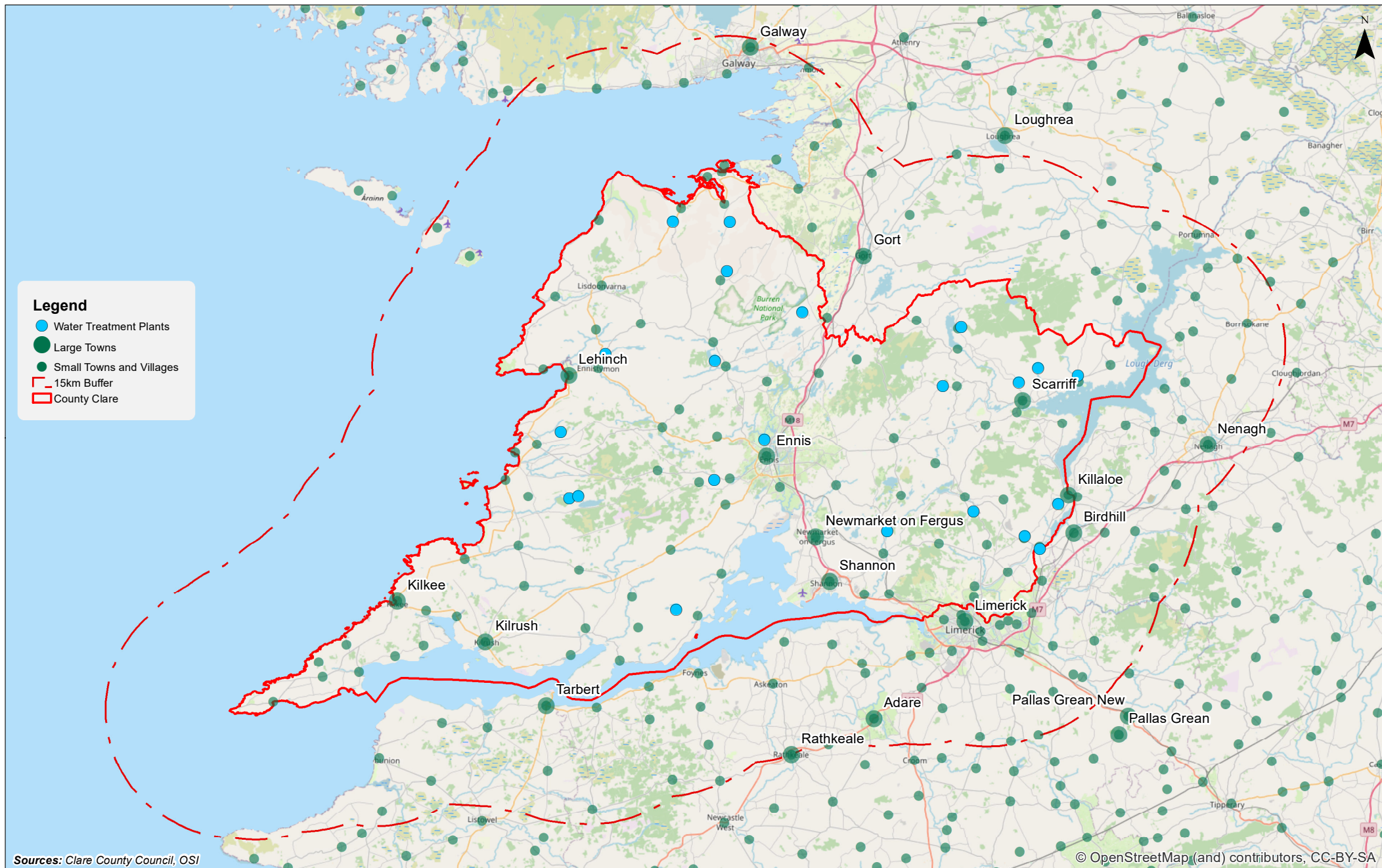
Wastewater services tend to be associated with individual settlements/agglomerations and there are significant service and compliance issues in many existing wastewater systems in Clare. The safe treatment and disposal of sewerage is fundamental to the sustainable development of our society. The treatment of wastewater is either through wastewater treatment plants or individual septic tank units.

Irish Water has responsibility for provision and management of wastewater facilities serving sewered towns and villages, including the management of storm water. The maintenance, upgrading and provision of the County's wastewater drainage system is essential to accommodate future development requirements and to ensure the sustainable development and environmental protection of the county. At present there are significant service and compliance issues in many existing wastewater systems in County Clare. **Figure 5.11-1** summarises the percentage by 'Types of Wastewater Systems in County Clare'. **Figure 5.11-2** provides the geographical location of Waste Water Treatment Plants across the county. According to the EPA Urban Waste Water Treatment Report, 2019 Kilkee, Kilrush and Ballyvaughan were all found to be discharging untreated waste water to our seas. In addition Shannon Town, Ennis South and Lahinch failed to meet the European Union's treatment standards in 2019.

Figure 5.11-1: Types of Wastewater Systems County Clare 2016



Source CSO 2016



Outside of the larger towns and villages most developments in County Clare are treated by individual proprietary wastewater treatment plants and septic tanks. Developments in these unserved areas must demonstrate that the onsite wastewater treatment system can safely and adequately dispose of effluent in accordance with the relevant EPA *Code of Practice*. Within County Clare the current settlement hierarchy identifies 85 settlements however, only 33 of these settlements have a public sewer. In line with the requirements of the National Planning Framework any settlements which are currently unsewered should be allocated new residential zoning or population allocation. Irish Waters, Investment Programme only runs to 2024 with the CDP running until 2028 providing a considerable time lag. The Investment Programme provides for limited investment in Clare in the short term. In the absence of a long term investment plan it is impossible to provide for growth in important service centres such as Ennistymon, Lahinch and Killaloe amongst others with no planned investment in unserved towns and villages. This could lead to the creation of undue pressure for septic tanks in rural towns and villages with potentially an increased demand for one off housing in County Clare.

5.11.6 Renewable and Alternative Energy

Figure 5.11-3, as taken from the draft RES shows the location and installed capacity (Mw/h) of renewable energy projects in Clare which include energy from wind, solar, hydro, wave, tidal. It does not show projects which were refused permission or projects which are deemed to be exempted development having regard to the Planning and Development Regulations 2007- 2008.

Figure 5.11-3: Location and Operating Capacity (Mw/h) of Renewable Energy Projects in Clare

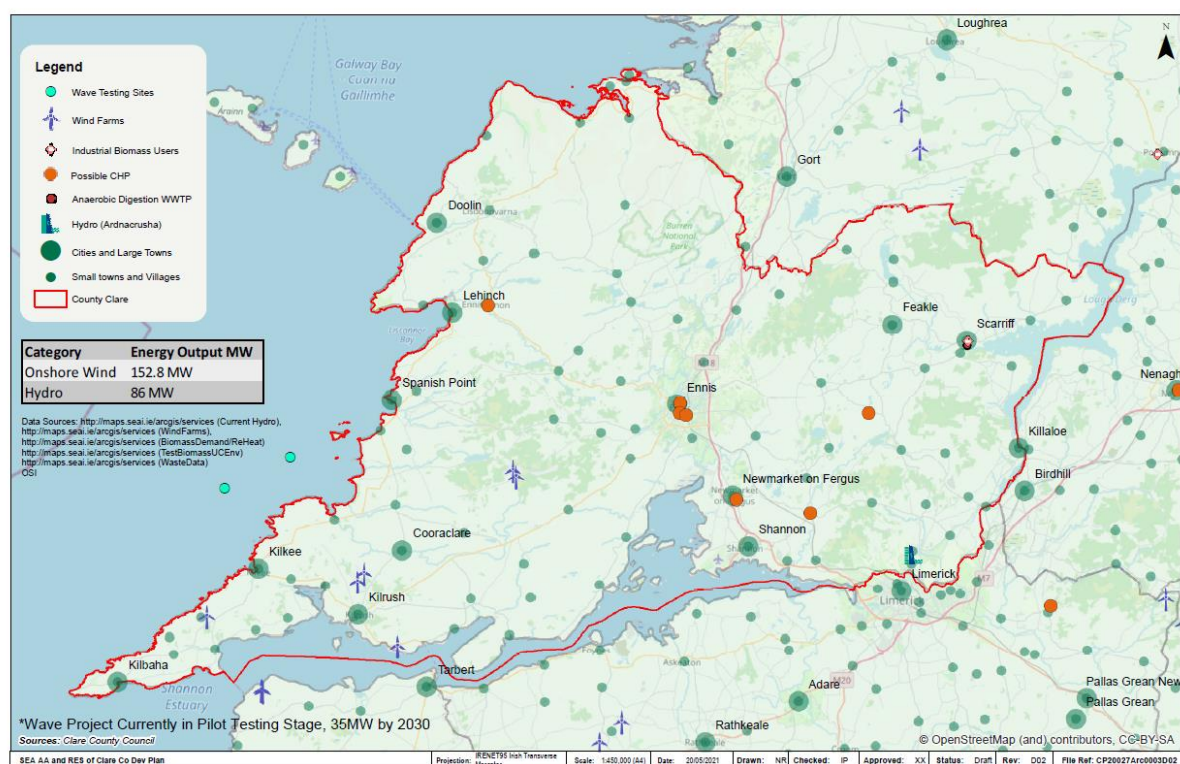


Table 5.11.1: Renewable Energy Generating Facilities in Clare in 2020

Renewable Energy Type Name		Resource	Installed Capacity (MW)
Wind	Total	Wind	152.8
Hydro	Ardnacrusha	Water	86
Tidal	Total	Water	0
Wave	Total	Water	0
Solar	Total	Sun	0

In addition, there are renewable energy projects permitted but not constructed/not operational and proposed renewable energy development in Clare which include energy from wind, solar, wave, tidal, biomass and energy storage. The table below shows the permitted capacity for County Clare.

Table 5.11.2: Permitted Capacity in Clare

Renewable Energy Type	Permitted Capacity (MW)
On shore wind	347.17
Solar	110
Hydro	86
Wave	0
Tidal	0
Biomass	0
Energy Conversion Systems/ Storage	60

*NECP expects 30MW in ocean energy across Ireland. For the purpose of the Energy Emissions Balance Report, an assumption was made of 5MW to be achieved in Clare, allocated evenly to tidal and wave.

Table 5.11.3: Permitted and Installed No. Facilities

Renewable Energy Type	Installed No. Facilities	Permitted Number Facilities
On shore wind	9	7 (note some are extensions of existing facilities)
Off shore wind	0	0
Solar	0	9
Hydro	1	0
Wave	0	0
Tidal	0	0
Bio-energy (large scale)	0	0

5.11.7 Existing Environmental Problems

There is a need to increase energy efficiency and conservation within County Clare and it is obliged to contribute towards the EU wide target of achieving at least 32.5 % improvement in energy efficiency

For offshore wind developments there will be a need to balance the installation of such developments with fishing, aquaculture, tourist, biodiversity and navigational needs and interests.

There is insufficient Waste Water Treatment to cater for existing and projected population growth in the county. Therefore there is a need to provide additional wastewater treatment infrastructure/capacity. Additional pressures on the environment come from poorly functioning septic tanks which place pressures on surface and groundwater's.

The travel patterns in Clare are governed to a large extent by private cars. Therefore there are existing pressures on ensuring that the transport network is adequate and maintained. There is a need to look at the provision of public and/ or community transport service options to ensure that the existing and future population growth of County Clare has sufficient access to public transport.

The transport network, i.e. roads, can be impacted during the construction phase of a proposed renewable energy development, in order to facilitate the delivery of infrastructure and construction materials, as well as during decommissioning. During construction it is anticipated that there may be increases in traffic volumes using the road network, particularly regional and local roads which are not generally designed to cater for significant volumes or frequency of heavy traffic. If not properly managed, this has the potential to cause disruption and delay to local road users, as well as damage to the roads. Indirect impacts include generation of dust and noise. For some projects, there may be a requirement to widen local roads in places. Temporary removal of street furniture and potential structures (bridges and concrete pipe) may require works to facilitate abnormal load vehicles and also the safe passage of ready-mix trucks and other delivery vehicles. Any improvement works undertaken during the construction phase can also result in indirect long-term positive impacts for road users.

Lack of a security of supply for thermal treatment facilities is recognised as a threat, as is the lack of adequate facilities for biological waste treatment. The all-Ireland approach to Waste Management under the new National Waste Management Plan currently being drawn up should allow for better efficiency in planning delivery.

There is high technical potential for hydro power in Clare given the county's large coastline and water resources. Clare has a history of utilising hydro power (e.g. Ardnacrusha hydroelectric power station); however realistic plans will be influenced by specific site conditions. Developments could also be influenced by fishery interests and seasonal water flow, and balanced with the needs of tourism. Other constraints include establishing adequate grid connections and lack of interconnections with neighbouring countries (connected countries can buy and sell power during seasonal fluctuations without the need to store energy); the need to be in close proximity to existing wind energy developments, high capital costs and policy gaps at the National and Regional level (currently no guidance for energy storage or site selection) are other considerations.

While Pumped Hydroelectric Energy Storage (PHES) is the most mature and largest energy storage technique available, these developments are also constrained by high capital costs, long lead-in times and policy gaps at the National and Regional levels.

All renewable energy developments have the potential to effect or impart environmental pressures in particular on biodiversity, habitats/designated areas and water quality, in addition to the visual impact to scenic landscapes and settlements. Landuse, landscape and biodiversity capacity to accommodate future onshore wind farm development is considered a threat and constraint to the role onshore wind will play in meeting any future energy targets from renewables.

The development of solar farms is hindered as there are no national guidelines in place to guide the location or scale of solar farms at national or county level. Constraints may arise in relation to landscape impacts, protection of natural heritage or archaeology, or in relation to protecting the high value agricultural land suitable for tillage. Proximity to housing is another factor, although solar farms have limited external impacts beyond the site boundary.

Lack of a secure grid connection is recognised as a threat, as it the potential requirement to provide new grid connections and the potential construction impacts associated with the provision of infrastructure.

The main issues for the draft RES relating to material assets include the following:

- Competing land uses;
- A shift towards intensification in the agriculture, forestry, fisheries and renewable energy sectors;
- Conflicting policy and guidance between sectors;

- Inadequate grid connection, port facilities or road network to support RE infrastructure; and
- In-combination impacts on biodiversity, water, soils, landscape, cultural heritage, soils etc. from competing sectors.

5.11.8 What will happen to Material Assets without the implementation of the RES

In the absence of the RES there may be development of projects in areas which are not ideal or strategic, and this in turn could lead to the building of additional unnecessary infrastructure as well as additional impacts from increased transport and associated emissions if such developments are located in rural or isolated areas. Additionally, without the RES there would be no guidance for the provision of necessary infrastructure, for example, new road access for renewable energy developments or upgrading of ports to accommodate offshore RE development. The RES should also lead to more focussed and strategic renewable energy developments as it provides a framework of guidance and without this, the utilisation of renewable technologies may proceed at a slower pace.

5.11.9 Data Information Gaps

- No national guidelines in place to guide the location or scale of solar farms at national or county level.
- Awaiting adoption of Wind Energy Guidelines.

5.12 Architectural Archaeological and Cultural Heritage (CH)

The main issue for cultural heritage associated with the implementation of the draft Plan is the resulting potential for both direct and indirect impacts on archaeological and architectural features and their settings as a result of siting of RE infrastructure.

5.12.1 Overview of Cultural Heritage Protection in Ireland

The main records of heritage sites and features include those listed as follows.

Record of Monuments and Places (RMP)

The RMP is the statutory list of all known archaeological monuments in Ireland as compiled by the Archaeological Survey of Ireland, part of the Department of Housing, Local Government and Heritage.

National Inventory of Architectural Heritage (NIAH)

The NIAH identifies, records and evaluates the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for the Environment, Heritage and Local Government to the planning authorities for the inclusion of particular structures in their Record of Protected Structures.

Record of Protected Structures (RPS)

The NIAH surveys provide the basis for the recommendations of the Minister for Housing, Local Government and Heritage [previously the Minister for Environment, Heritage and Local Government] to the planning authorities for the inclusion of particular structures in their RPS. Under the Planning and Development Act (PDA), local authorities are required to compile and maintain an RPS in their development plans. Sites included in the RPS are awarded automatic protection and may not be demolished or materially altered without grant of permission under the Planning Acts.

Architectural Conservation Areas (ACA)

ACAs comprise, as stated in the PDA, ‘*the character of a place, area, group of structures or townscape, taking account of building lines and heights, that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or value, or contributes to the appreciation of protected structures.*’ Provisions for the protection of ACAs are made by planning authorities as part of development plans, which includes the boundaries of ACAs.

United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Sites (WHS)

The WHS includes cultural and natural heritage sites around the world considered to be of outstanding value to humanity. There are no UNESCO sites in County Clare however it is noted that The Burren has been submitted by Ireland for consideration the tentative WHS list.

This section of the Environmental Report discusses cultural heritage which includes archaeological and architectural heritage.

Architectural Heritage

Part IV of the Planning and Development Act 2000 (as amended) defines the term “architectural heritage” as: structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of structures and buildings, and sites, which are of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest” and “where a structure is protected, the protection includes the structure, its interior and the land within its curtilage (including their interiors) and all fixtures and features which form part of the interior or exterior of all these structures”.

There are currently 911 protected structures in the RES area ranging from churches, bridges, grain stores, houses, shops and public buildings (Refer to **Figure 5.12.1** “Protected Structures”). Many structures of industrial and railway heritage are also included in the Record. The town centre which has survived almost intact since the late 16th century and other groups of buildings in the plan area are designated Architectural Conservation Areas, affording protection to the exterior of all structures within the ACAs in order to protect the unique architectural character of an organically evolved, mediaeval, Gaelic market town.

An ACA refers to a place, area, group of structures or townscape, that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or that contributes to the appreciation of a protected structure, and whose character it is an objective of a Local Area Plan to preserve. Its inclusion within the Plan, in terms of Section 81, Part IV of the Planning and Development Act, 2000 (as amended) affords greater control over the form of development that may be permitted and reduces instances of inappropriate development, demolition and unnecessary change within the designated area.

There is also, in the Plan area, a rich heritage of stone buildings and examples of a rich vernacular building tradition which evolved, over many millennia, to suit life in this part of County Clare. While many of these are not included in the Recorded of Protected Structures, they nevertheless contribute to the character of an area by their history, use of local, sustainable materials, classical proportions and inoffensive scale. It is important that such buildings are preserved into the future to maintain the attractive character of our rural landscape and contribute to the amenity and pleasure of residents and visitors alike.

5.12.2 Archaeological Heritage

Archaeological heritage is defined as including structures, places, caves, sites, features or other objects, whether on land underwater or in inter-tidal zones. All archaeological structures, constructions, groups of buildings, developed sites, all recorded monuments as well as their contexts, and moveable objects, situated both on land and underwater are part of the Archaeological Heritage. Therefore, the archaeological heritage of the area is not confined to the archaeological sites within the Record of Monuments and Places. It also includes any archaeological sites that may not have been recorded yet, as well as archaeology beneath the ground surface, or underwater as well as the context of any such site discovered.

There are currently c. 8387 monuments in Clare, which is more than most counties in Ireland. Notably, there is little evidence from the earliest period, the Mesolithic, but the Neolithic or New Stone Age and subsequent eras are well represented with many sites and artefacts demonstrating life in Clare for the past 6,000 years. These early farmers left little evidence of their settlements, but their territorial/burial monuments survive. Large numbers of megalithic structures are found in the Burren including the Poulawack Cairn, a burial mound constructed more than 5500 years ago, which is of National importance. Nearby are Parknabinnia Chambered Tomb and a pre-historic quarry possibly used to extract stone to build these structures. North of this cluster stands what is possibly the most iconic monument in County Clare, the Poulabrone Portal Tomb. Various megalithic tombs also

survive in other areas of County. Refer to **Figure 5.12-2** for recorded monument throughout the County of Clare.

The Bronze Age, 2500-500BC is represented by less dramatic visible structures, but no less important. They include wedge tombs, standing stones, stone circles and various types of burial mounds or barrows. By far the most common monuments in County Clare are ringfort enclosures existing in large numbers in rural areas (c. 3,000 examples). There are a number of different types: earthbank (rath or fairyfort), stone wall (caiseal) and combined earth and stone. Originally, it is thought they were farmsteads protecting people and livestock and some were reused more recently as cillíns or burial sites for strangers and unbaptised children. Common also from this early mediaeval period are crannógs or small artificial islands in lakes. There are over 170 medieval stone churches in County Clare, as well as a number of larger ecclesiastical sites, such as Clare Augustinian Abbey, Corcomroe Cistercian Abbey and Ennis and Quin Franciscan Friaries. During the Medieval period, Norman castles were built at Bunratty (later demolished), Quin and Clarecastle, while over 230 Gaelic tower houses were built in the County during the 15th century.

The list of recorded monuments in Clare also includes field systems, log boats, souterrains, watermills, fulachta fiadh (ancient cooking places), holy wells, medieval roads, bridges, promontory forts, round towers and earthworks. This is a rich and varied record of past human activity, in the County.

Rivers have acted as focal points for both settlement and ritual activity through all periods of human settlement; this is borne out in County Clare by the number of recorded archaeological sites close to the River Fergus, for example Knockanoura Castle (CL033-087) and Skehanagh Castle (CL041-089). Under the National Monuments (Amendment) Act (2004) the archaeological heritage within County Clare is protected. The Record of Monuments and Places (RMP) for County Clare is an inventory of archaeological sites of significance and according to the CDP there are approximately 8,387 archaeological sites within County Clare.

Recent archaeological surveys of intertidal areas in the Shannon Estuary have uncovered a wealth of archaeological material including evidence of prehistoric settlement dating back to 7000BC. There are eight submerged forest locations, three of which represent relict woodland that has been inundated by rising water levels and which can date back far into prehistory. The inventory indicates references to 127 ship wrecking events between the sixteenth and the early twentieth century. However, only 16 wreck sites can be located precisely (SIFP SEA Environmental Report). The INFOMAR programme also maintains a Shipwreck Inventory (2002-2013), and from this inventory only one shipwreck location has been mapped in the surrounding waters for County Clare, that of the *SS Premier*.

5.12.3 Climate Change and Cultural Heritage

Climate change is a significant threat to cultural heritage across our county given the impact storm surges, increased rainfall events and coastal erosion have on our exposed coastline.

The Clare Climate Change Adaptation Strategy identifies the potential for damage to cultural and heritage assets and cultural landscapes from increased storm and rainfall events due to climate change. The consequences of this can lead to a negative impact on tourism leading to economic consequences locally and regionally. The loss of assets of intrinsic historical importance is of particular concern. We need to foster meaningful approaches to protecting natural and key cultural assets through an appreciation for the adaptive capacity of the natural environment to absorb the impacts of climate change. Action No. 1 under Objective 2 of the Draft CDP 2023-2029 *To protect heritage and cultural infrastructure* of the Clare Climate Change Adaptation Strategy seeks to undertake a risk assessment of the Heritage and Cultural Assets in the county to assess the vulnerability and the risk to the historical environment from the impacts of climate change and to help build resilience to these important assets.

5.12.4 Existing Environmental Problems

Although cultural heritage is afforded the highest level of legislative protection, e.g. Record of Protected Structures and Architectural Conservation Areas, impacts may occur due to pressure from inappropriate RE developments.

These inappropriate RE developments may impact on the known and sub-surface archaeological heritage features. In particular, there is existing pressure from dredging of the Shannon Estuary which has the potential to disturb historical shipwrecks, as only several are in known locations.

Significant development pressures may vary depending on the location within the Plan area.

Development on sites adjoining protected monuments, places or structures can also impact the setting of these cultural heritage items. In addition the archaeological monuments in the Burren are continually facing pressure through encroachment of scrub vegetation.

In this context, the key issues associated with the implementation of the draft RES and cultural heritage relate to:

- Effects on cultural, architectural and archaeological heritage features in the vicinity of proposed RE infrastructure.
- Potential for disturbance of previously undiscovered archaeological remains near or within development of RE infrastructure development sites.
- Impacts to setting and cultural heritage rich areas such as the Burren and the Shannon Estuary.

5.12.5 What will happen to Cultural Heritage without the implementation of the RES

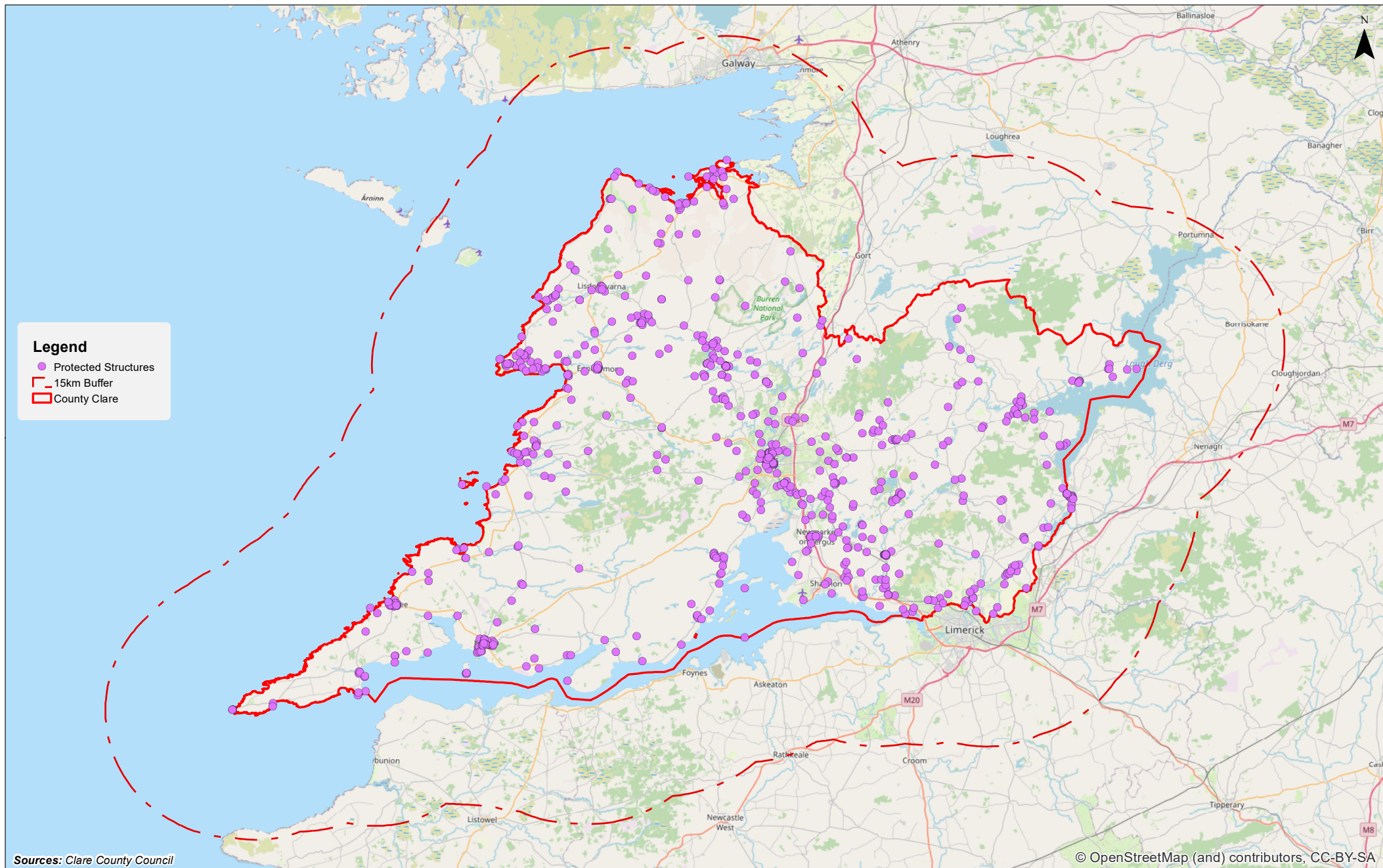
County Clare has a significant assembly of cultural heritage with extensive and effective legislation and guidance from International to national level affording both the architectural and archaeological heritage a high level of protection which is largely implemented through the CDP. In the absence of the RES this protection would remain as the CDP would continue to provide a framework to regulate, aid and/or control development whether economic, social or environmental.

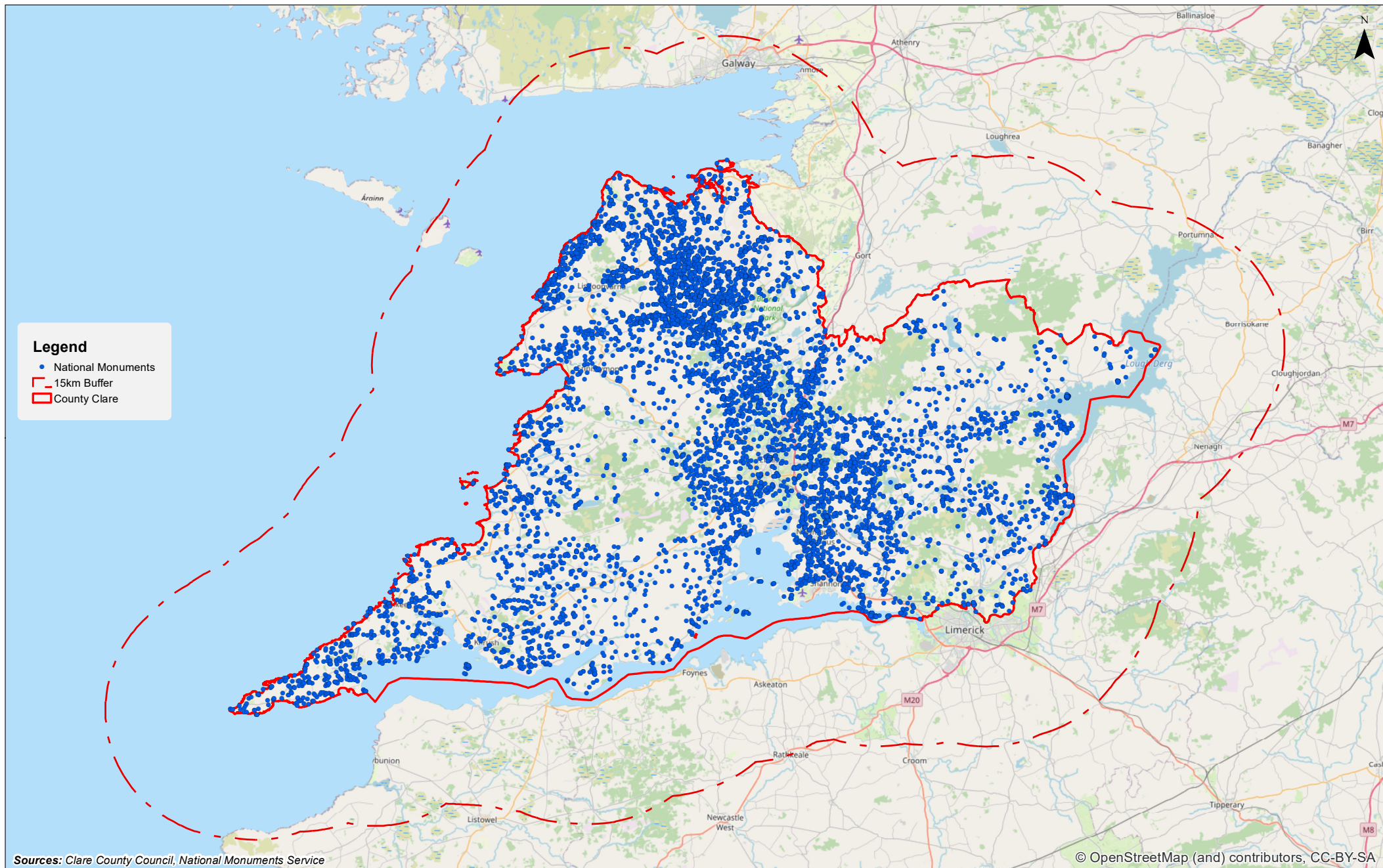
The Draft RES will support the policies and objectives contained within the CDP but in addition includes mitigation specific to RE infrastructure and in some case site specific measures.

Thus, the evolution of cultural heritage in the absence of the RES would be highly dependent on the implementation of the CDP and may result in some impacts to cultural heritage perspective that is site specific to RE infrastructure at certain locations that is not captured in the CDP i.e. under water archaeology in the Shannon Estuary and potential for impacts associated with grid connections.

5.12.6 Data Information Gaps

It would be advantageous to undertake a detailed survey of the existing, historic and stone bridges in the Plan area to assess the historic, vernacular, design and amenity value for their protection. While a North Clare Bridge study was completed in 2015 the roll out of this county wide would be beneficial.





SEA AA and RES of Clare Co Dev Plan

Projection: IRENET95 Irish Transverse
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5.13 Landscape (LandS)

5.13.1 Introduction

Landscape is defined as an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors (European Landscape Convention, 2002). This definition is incorporated through Part 2, Section 4(c) of the Planning and Development (Amendment) Act 2010. Within the Heritage Act 1995 landscape is defined as including “areas, sites, vistas and areas of significant scenic, archaeological, geological, historical, ecological or other scientific interest”.

Landscape consists of a series of layers including landform (geology and geomorphology), land cover (vegetation, water, human settlements) and human values (historical, cultural, religious) and other understandings and interactions with landform and land cover. The landscape plays an important role in people’s lives, providing individuals and communities with a sense of identity and belonging, as well as bestowing a sense of place. Landscape is the context within which change takes place.

5.13.2 Landscape Designations and Protection

There are two key studies that have been undertaken to characterise the diverse landscapes for the County and combined they provide a detailed set of landscape designations for the County which have been incorporated within the policies and objectives of the County Development Plan. The reports are:

The **CAAS Report (1997)** “Criteria for the Evaluation of Landscape Quality” which identified the visually sensitive features of the landscapes of the County and informed the 1999 Clare County Development Plan; and

The Heritage Council Landscape Character Study/ERM (2003) which provided a very detailed characterisation of the different parts of the County in line with the thinking of the DoEHLG (2000) Landscape and Landscape Assessment – Draft Planning Guidelines for Planning Authorities.

The National Landscape Strategy (NLS) for Ireland 2015-2025 seeks to provide a framework for the protection of the many cultural, social, economic and environmental values embedded in the landscape. The objective of the Strategy is to provide the data that will assist in the future decision making process regarding our landscapes, and which will ensure that decisions are made on the basis of factual evidence collected. The NLS will assist in the achievement of greater consistency in decision making across the country when dealing with issues of landscape, in particular via landscape character assessment. It will be used to ensure compliance with the European Landscape Convention and to establish principles for protecting and enhancing the landscape while positively managing its change. It will provide a high level policy framework to achieve balance between the protection, management and planning the landscape by way of supporting actions.

As part of the Clare County Development Plan 2011-2017 (as varied), Clare County Council in conjunction with CAAS Environmental Services revisited the policy approach, called “Clare’s Living Landscapes”. This approach builds on the “Landscape Character Assessment of County Clare”.

5.13.3 Landscape Characteristics of the Plan Area

The components of Landscape Character Assessment are Landscape Character Types, Landscape Character Areas and Seascape Character Areas.

a. Landscape Character Types

These are distinct types of landscape that are relatively homogenous in character. They are generic in nature in that they may occur in different localities throughout the County. Nonetheless, where they do occur, they commonly share similar combinations of geology, topography, land cover and historical land-use, for example, limestone river valleys and blanket bog uplands. There are 26 landscape types identified within the County, sub-divided into three groups, namely Upland Types, Lowland Types and Coastal Types. In addition the Landscape Character Assessment identified:

Habitat Types – an area in which an organism or group of organisms lives and is defined by the living and non-living components of the environment. The latter includes physical, chemical and geographical factors, in addition to human impact or management;

Historical Landscape Types – an archaeological or historic landscape is a discrete landscape based on the “scale and integrity of the archaeological features (that) reflect significantly on the human history and land use of that area”.

b. Landscape Character Areas

Landscape Character Areas (LCA) are units of the landscape that are geographically specific and have their own character and sense of place. Each Landscape Character Area's distinctive character is based upon patterns of geology, landform, land-use, cultural, historical and ecological features. The Landscape Character Assessment for County Clare identified 21 Landscape Character Areas and are shown on **Figure 5.13.1** “Landscape Character Areas”. There is a potential for permanent infrastructure or developments within the county to impact landscape and visual amenity temporarily during construction or permanently throughout operation.

c. Regional Seascape Character Areas

In 2020 the Marine Institute published a report outlining the Regional Seascape Character Areas for Ireland⁵⁹. The report presents the seascape character assessment which will form a core component of the evidence base for Marine Spatial Planning and marine policy formulation. The aim of the study was to identify, classify and describe seascape character at a regional scale. It is important to recognise that seascape character is a dynamic and changing space which is particularly relevant for the Clare coastline which is highly subjected to coastal erosion and the influences of the Atlantic. In addition, as seascape is perceived by people, it therefore follows that there are many interpretations and understandings as to what contributes to and creates seascape character. The study undertaken by the Marine Institute fills an identified gap in baseline descriptions of seascape character; it also contributes to achieving commitments under the European Landscape Convention 1.2 (ELC) and Ireland's National Landscape Strategy (NLS) 2015 – 2025. Seascape Character Assessment (SCA) has emerged as a method for assessing, characterising, mapping and describing seascape character. The process of SCA follows the well-established, and widely used, process of Landscape Character Assessment as outlined in (b) above. Seascape is defined as “an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land with sea, by natural and/or human factors”.

The Regional SCA identifies three Regional Seascape Character Areas for Clare as follows and as shown in conjunction with the Seascape Character Areas in **Figure 5.13-2**;

- SCA6 – Atlantic Galway Bay & islands
- SAC7 – Atlantic Clare Cliffs
- SCA8 – Shannon Estuary and Tralee Bay

d. Seascape Character Areas

A seascape can be defined as comprising one or more views from land to sea, views from sea to land, views along coastline, and/or the effect on landscape of the conjunction of sea and land. The LCA for County Clare area identified 12 Seascape Character Areas as shown in **Figure 5.13-2**. They include; Blackhead Bay, Burren, Cliffs of Moher, Liscannor Bay, Malbay, Mutton Island & White Strand, Ballard Bay & Donegal Point, North Loop Head Peninsula, South Loop Head & Shannon Mouth, Lower Shannon, River Shannon and the Fergus Estuary.

Within the Landscape Character Assessment a Seascape is defined as comprising of one or more of the following:

- views from land to sea;
- views from sea to land;
- views along coastline; and
- the effect on landscape of the conjunction of sea and land.

⁵⁹ https://emff.marine.ie/sites/default/files/bluegrowth/PDFs/seascape_character_assessment_consultation_report_part_1_0.pdf

5.13.4 Landscape Sensitivity

Within County Clare there are a number of valuable scenic routes which offer a very attractive cross-sectional view and overall impression of differing landscapes. Scenic routes will be considered insofar as they can be visible from surrounding counties also. The scenic routes are located within and close to heritage landscape and include loughs, landscapes, ridges and islands. There are also walkways within the county which are of great significance and a number of trees within County Clare which are to be preserved, many of which are located on scenic routes as shown on **Figure 5.13-3**.

5.13.5 Living Landscapes

The Clare County Development Plan 2023-2029 identifies three types of living landscapes within which all parts of the county fall within one or more. It is in recognition of different parts of the County having different potential for how communities can pursue their ambitions and aspirations. Different areas have different strengths and weaknesses and as such what may be suitable for one area may not be suitable for another. The three types of living landscapes include Settled Landscapes, Working Landscapes and Heritage Landscapes. Please see **Figure 5.13-3** "Landscape Designations" which shows the landscapes within the Plan area as described below.

a. Settled Landscape

A settled landscape is where the majority of the population work and live and comprise of all landscapes not classified as Heritage or Working landscapes.

b. Working Landscape

Working landscapes are those areas within Settled Landscapes that contain pockets of concentrated development or a unique natural resource. The central part of the county including lies within the Western Corridor (Ennis to Limerick) Working Landscape. This corridor has the highest concentration of population and jobs and the strongest transport links and connectivity, which includes the County/Hub town of Ennis.

c. Heritage Landscape

Heritage Landscapes are those areas where sensitive environmental resources – scenic, ecological and historic, are located. The principal role of these landscapes is to sustain natural and cultural heritage. North Clare and the Burren together with parts of East Clare and the fringes of West Clare lies within a Heritage Landscape as shown on **Figure 5.13-3**.

5.13.6 Local Landscapes Features

Landscapes within urban areas provide a valuable contribution to an individual's sense of well-being and quality of life. These could consist of a glimpse of countryside between buildings, a tree-lined river bank or street or a secluded pocket of woodland. All are worthy of preserving. An erosion of these small, but important landscapes, will cumulatively over time have a negative effect on the environment within which we live and impact on our well-being and also potentially on our broader environment including on biodiversity and climate change.

The plan area is rich in natural landscape features which reflect the character and local distinctiveness of both the urban and rural landscapes, including rivers, streams, ponds, lakes, turloughs, woodlands, hedgerows and field boundaries.

5.13.7 Issues and Threats in the RES Area

Existing pressures on landscape and visual resources are related to sensitive views and landscapes resulting from the siting of RE developments and infrastructure, without sensitive regard to these resources. The intrusion onto greenfield sites for RE development can have a significant effect on the landscape and local landscape features in rural and urban areas.

The character and landscape of seascapes can be compromised as a result of RE development. The visual impact of a development on the landscape should be considered from various visual aspects

and in combination with any surrounding development. A failure to consider proposals in the context of potential cumulative effects on the landscape presents a serious threat to future landscapes.

The National Landscape Strategy for Ireland 2015-2025 will be the means by which the State will provide a framework for the protection of the many cultural, social, economic and environmental values embedded in the landscape with a key action to develop a National Landscape Character Assessment. However, since its publication, there has been no further progress made towards carrying out national or regional landscape character assessments. The RSES's have expressed a commitment to preparing a regional LCA, once a national LCA has been completed, which represents a significant data gap from the top-down.

Key existing pressures for landscape relate to:

- Developments which impact on designated landscape(s);
- Impacts on landscape character as a result of infrastructure and changes in land use/ cover;
- Impacts on cultural heritage resources and visual interactions between heritage and landscape setting/ character;
- Impacts on natural heritage resources and tourism assets which are dependent on the adjoining landscape setting;
- Impacts on tourism/recreation areas; and
- Cumulative impacts arising from multiple development pressures.

The absence of such regional/national LCAs represents a significant data gap for the RES, as RE can have significant impacts on a landscape as well as cultural and historical setting and character if not appropriately assessed and mitigated. The key typical issues associated with the development of the RE and landscape relates to:

- Impacts of RE development on designated landscapes;
- Impacts RE development on landscape character;
- Impacts to views and visual amenity from RE development on dwellings and communities;
- Specific impacts related to RE development such as shadow flicker from wind turbines and proximity to turbines, need for overhead lines/ substations etc;
- Indirect land use changes associated with RE development;
- Potential impacts to recreation and amenity where there are access restrictions associated with RE development;
- Potential impacts to recreation, tourism and amenity where there are access restrictions associated with RE development;
- Potential impacts to recreation, tourism and amenity where there is inappropriate siting of RE development;
- Cumulative impacts arising from multiple RE developments, either in physical proximity or via visual impacts/intrusion;
- Cumulative landscape/visual impacts arising from multiple developments, either in proximity or due to lines of sight;
- Transboundary impacts associated with changes to landscape character or setting with Northern Ireland and developments which may be located in border areas; and
- Lack of regional or national landscape character assessments for Ireland.

5.13.8 What would happen to the landscape without implementation of the RES?

In the absence of the RES the landscape of County Clare would be offered protection by the CDP which would continue to provide a framework to regulate, aid and/or control development whether economic, social or environmental.

The Draft RES will support the policies and objectives contained within the CDP but in addition include mitigation specific to RE infrastructure and in some case site specific measures.

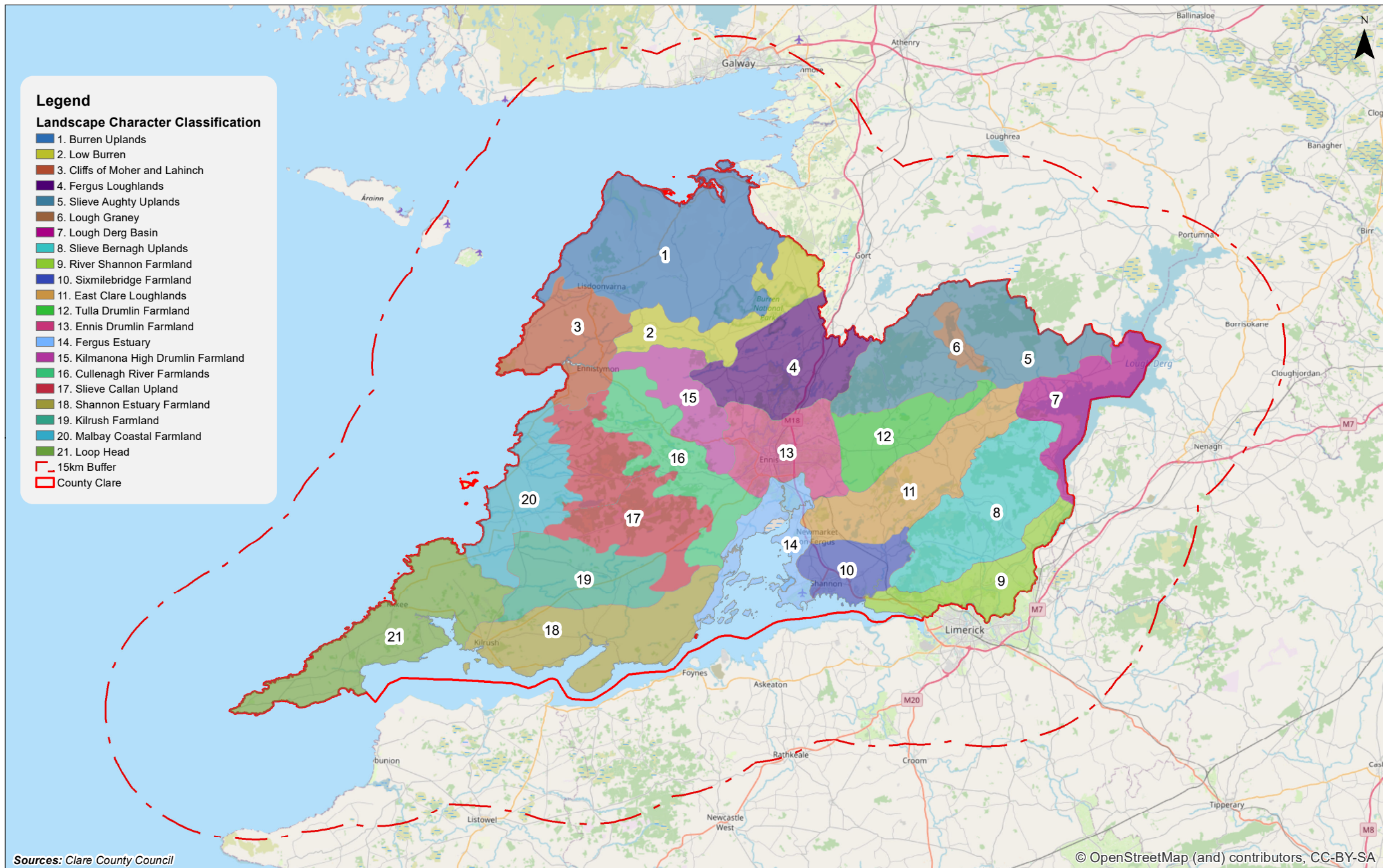
Thus, the evolution of the landscape and visual resource in the absence of the RES would be highly dependent on the implementation of the CDP and may result in some impacts to landscape perspective that is site specific to RE infrastructure at certain locations that is not captured in the CDP i.e. cumulative impacts of multiple turbines in landscape sensitive areas, loss of hedgerows from multiple solar farms etc

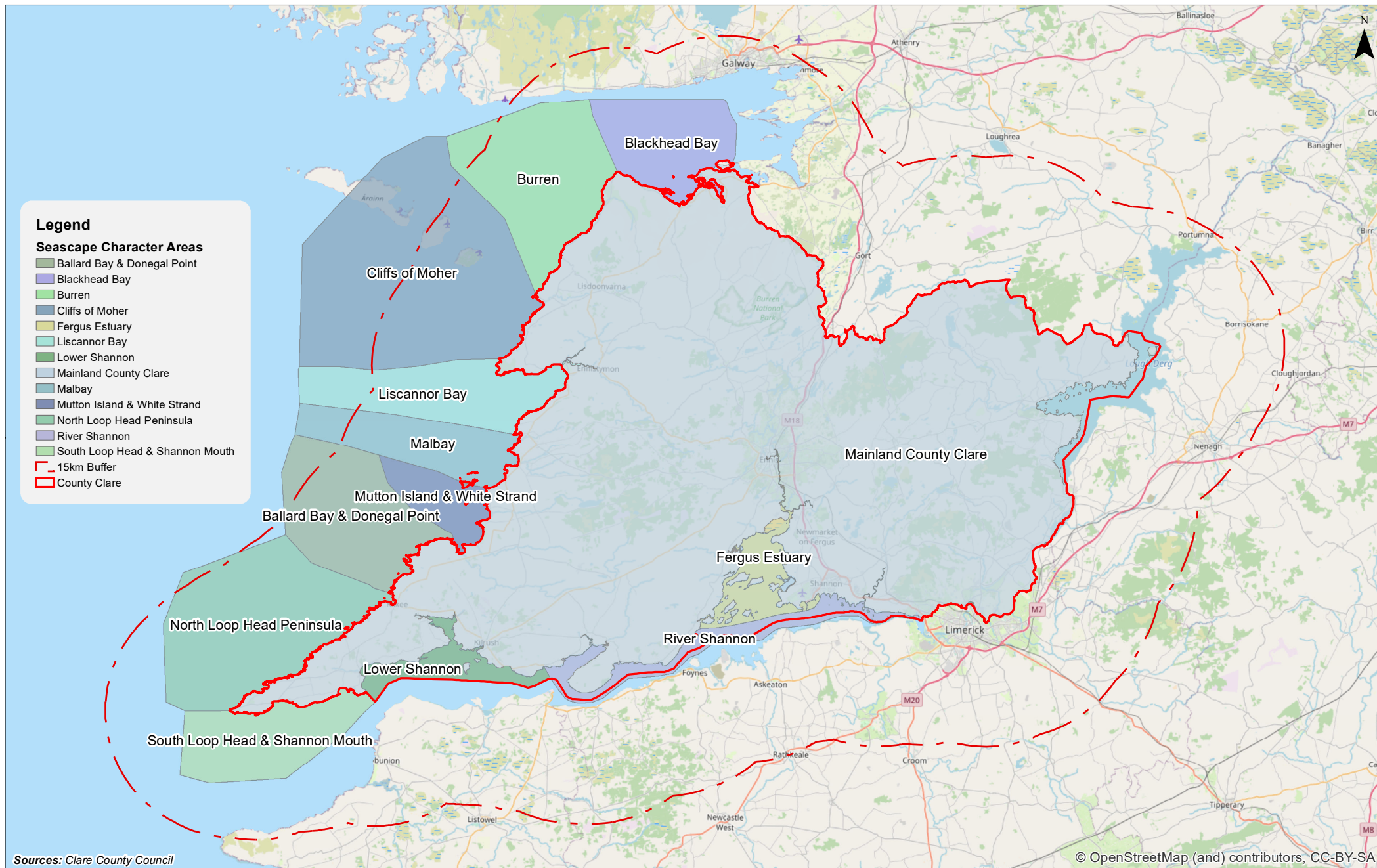
In addition, given the significant focus on the development of renewable energy off the Clare Coastline seascapes would not give due consideration in the assessment of such strategic developments. Whilst it is acknowledge that the Plan includes objectives that provide for the preservation, protection and enhancement of the landscape and seascape as part of an integrated sustainable planned approach to future development within the Plan area, the RES will further support this through additional policies for RE development.

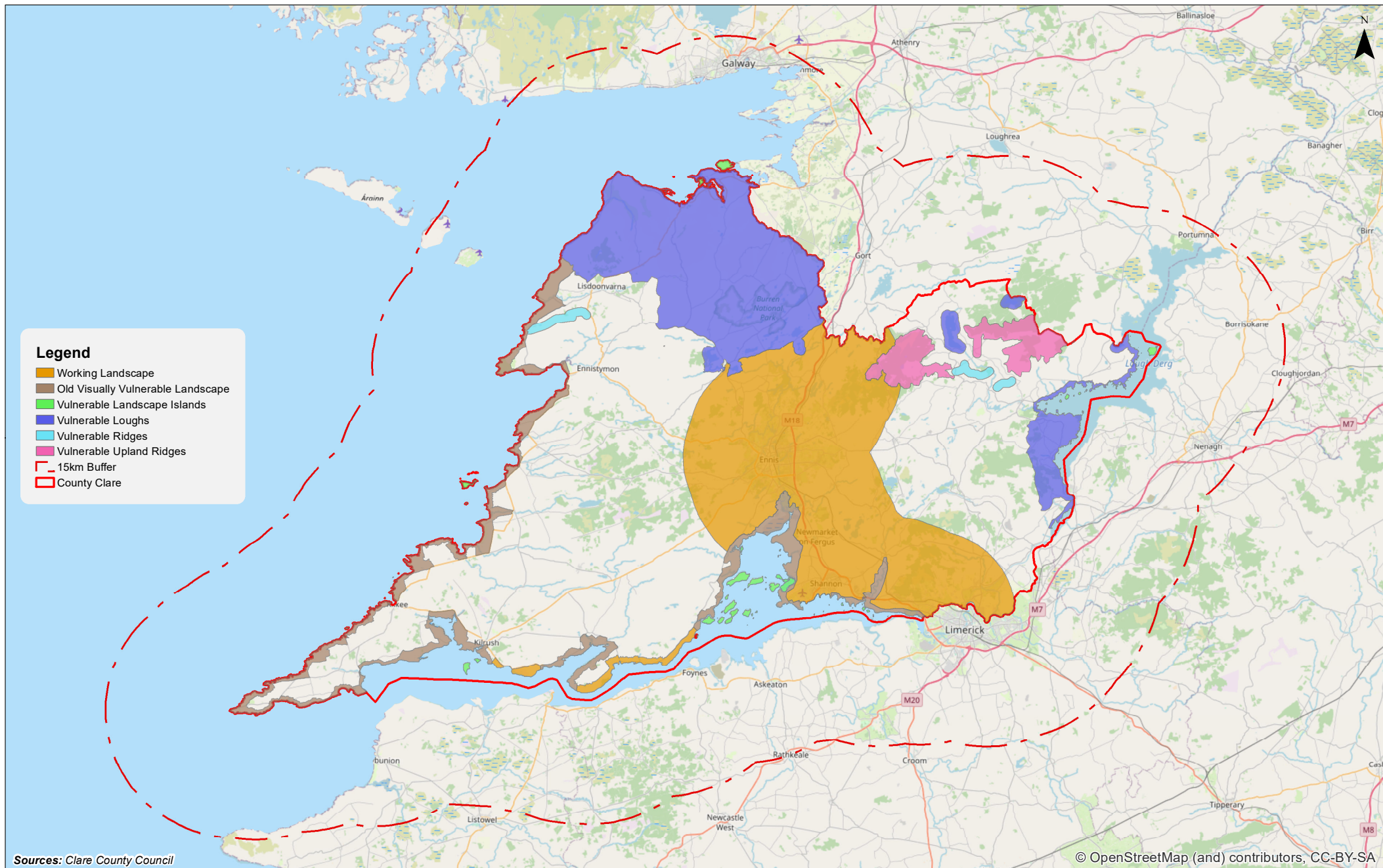
5.13.9 Current Issues and Problems/Data gaps/difficulties?

The National Landscape Strategy for Ireland 2015-2025 will be the means by which the State will provide a framework for the protection of the many cultural, social, economic and environmental values embedded in the landscape with a key action to develop a National Landscape Character Assessment. However, since its publication, there has been no further progress made towards carrying out national or regional landscape character assessments. The RSES's have expressed a commitment to preparing a regional LCA, once a national LCA has been completed, which represents a significant data gap from the top-down.

There are no up to date data on local landscape features within the plan area. A comprehensive survey would provide baseline information which would effectively inform where the focus of protection of these features should be directed.







SEA AA and RES of Clare Co Dev Plan

Projection: IRENET95 Irish Transverse Mercator

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Drawn: NR

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Approved: AG

Status: Final

Rev: F01

File Ref: CP20027Arc0048F01

5.13.10 Environmental Sensitivity Mapping

AIRO has developed an online environmental sensitivity mapping (ESM) Webtool, funded by the EPA under the STRIVE Programme for use in SEA and environmental assessments.^[1] ESM is a useful method for identifying, at a strategic level, environmentally sensitive areas helping to inform the assessment of cumulative and in-combination effects on the environment. Such sensitivity mapping is based on the principles of SEA and presents a visual overview of the relative sensitivity of areas, particularly where they overlap, in order to provide a more strategic and informed approach to planning. Sensitive environmental receptors have less capacity to absorb changes to their conditions.

Various layers under different SEA-relevant themes are processed in the online geographic information system (GIS) to allow spatial overlay and calculation of overall sensitivity. The sensitivity index/ colour scheme for the map output gives an indication of the relative sensitivity of the environment, with darker red indicating high sensitivity and greens to greys representing areas better able to absorb development. The maps can be tailored to the assessment context by including or excluding datasets (i.e. environmental criteria), and weighting can be assigned to environmental themes included in the sensitivity analysis. AIRO stresses that that weights are only to be used to emphasize the relative significance of an environmental aspect, as applying weights to more than two themes would magnify, and possibly overstate, the overall sensitivity. As there is no geographic specificity for the draft Plan actions, and the Plan is national and strategic in nature, all themes are assigned the default equal weight.

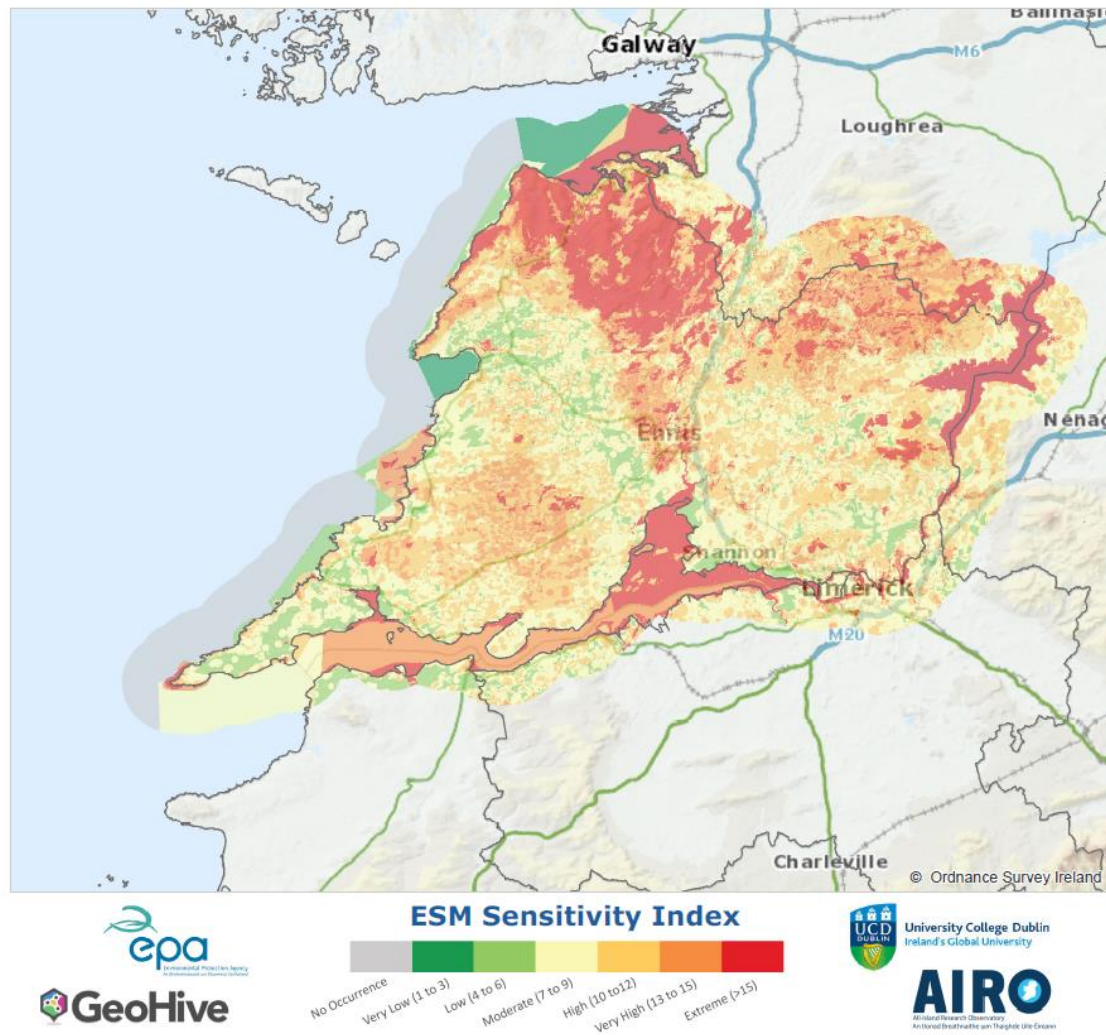
While it is acknowledged that there are limitations and an element of subjectivity to ESM, it can contribute to anticipating land use conflicts whereby increased development at lower planning tiers in sensitive areas could cause deterioration of the environment. The output maps of the ESM Webtool have a resolution of 100m x 100m and are to be used to inform strategic planning (i.e. they may not capture issues at the local level).

A cumulative sensitivity ESM has also been generated for County Clare which layers up multiple topics into one sensitivity map; see **Figure 5.13-4**. The variables used to generate the ESM maps are also included. Also outlined is the AIRO guidance text in relation to the use of the ESM Webtool. The ESM Sensitivity Index indicates the relative sensitivity of the following map. Red colours indicate higher sensitivity, yellow represents moderate sensitivity, and green indicates areas better able to absorb development. Grey would indicate that no significant sensitive environmental receptors occur at that location.

^[1] Link to the ESM Tool and guidance: <https://www.enviromap.ie/>

Figure 5.13-4: Environmental Sensitivity of the Plan Area

Environmental Sensitivity



Date: 5/31/2021 Time: 3:31:33 PM Author: RPS

5.14 Inter-relationships

In accordance with the SEA Directive, the inter-relationship between the SEA environmental topics must be taken into account; see **Table 5.14.1**. The key inter-relationships identified in this SEA are set out below and have been taken into account in the assessment of the different alternatives.

Of particular note are the primary relationships between water quality and biodiversity, flora and fauna. Flora and fauna, including protected species and habitats, rely directly on the aquatic environment as a habitat. Water and climate also have a key relationship. Global GHG emissions associated with the burning of fossil fuels, transport, industry and other sources have the potential to negatively impact on climate change. This in turn can result in more frequent and more intense flooding and drought conditions affecting material assets, such as private residences and infrastructure, and biodiversity through changes in water quality and the hydrologic regime.

Table 5.14.1: Inter-relationships between SEA Topics

Population & Human Health	✓							
Land & Soil	✓	✓						
Water	✓	✓	✓					
Air Quality	✓	✓	✓	✓				
Climatic Factors (including CCM, CCA)	✓	✓	✓	✓	✓			
Material Assets	✓	✓	✓	✓	✓	✓		
Cultural Heritage	X	✓	✓	✓	X	✓	✓	
Landscape	✓	✓	✓	✓	✓	✓	✓	✓
	Biodiversity Flora, Fauna	Population & Human Health	Land & Soil	Water	Air Quality	Climatic Factors (including CCM, CCA)	Material Assets	Cultural Heritage

✓ = interrelationship anticipated

X = no interrelationship anticipated

6 REVIEW OF RELEVANT PLANS AND PROGRAMMES

6.1 Introduction

As documented in the SEA Directive, the purpose of SEA is “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations in the preparation and adoption of plans and programmes with a view to promoting sustainable development”.

Therefore it is imperative that environmental considerations are documented and taken into account in the development of the draft RES. In order to do this, the environmental protection objectives from relevant key plans, programmes and policy must be first identified and then explored in relation to the draft RES.

The SEA Directive also states in Article 5(1) of Annex 1, that the environmental assessment must identify “the environmental protection objectives, established at international, European Union or national level, which are relevant to the plan or programme, or modification to the plan or programme, and the way those objectives and any environmental considerations have been taken into account during its preparation”. Therefore the main objectives of the draft RES must be outlined along with the “relationship with other relevant plans or programmes”. The draft RES is a county plan and therefore the review has focused on relevant regional, national, European and international plans and frameworks.

A list of key relevant plans and programmes has been compiled in **Appendix A**. This chapter and appendix are not intended to represent a comprehensive list of all legislation or plans/ programmes/ policies, but rather a collation of the most relevant and key environmental references.

6.2 Methodology

During the SEA scoping stage, key plans and programmes were identified and this chapter seeks to consider the objectives/measures within such plans/programmes which will directly drive and influence the draft RSES during its development. Such plans and programmes have been explored under specific topic headings addressing sectors such as: spatial planning, climate change, energy, transportation, water, agriculture, and nature conservation. In order to set a framework for exploring the relationship between the draft RES and key plans/ programmes the following two questions were borne in mind:

- Does the draft RES contribute to the fulfilment of environmental protection objectives set in other key plans/programmes? and
- To what degree are the environmental protection objectives/ measures set in these other key plans/ programmes impacted by the draft RES?

In addition, this chapter seeks to take on board comments made which refer to plans/programmes during the SEA scoping stage.

6.3 Key Sectoral Influences of Relevance to the draft RES

6.3.1 Climate and Energy

6.3.1.1 Global Context

The **Kyoto Protocol** was a landmark international agreement to which 192 countries including Ireland agreed to limit worldwide greenhouse gas (GHG) emissions. The protocol was adopted and ratified in 1997 under the **United Nation Framework Convention on Climate Change (UNFCCC)**.

Building on this, the United Nations Climate Change Conference of the parties (COP) serves as the formal meeting of the UNFCCC. The 12th December 2015, at COP21, marked the date that a legally-binding global agreement on climate change was agreed under the **Paris Agreement**. On this day, all governments agreed to a long-term goal of keeping the increase in global average temperature to well below 2°C above pre-industrial levels, and to aim to limit the temperate increase to 1.5°C. The Paris Agreement does not set a date for a peak in emissions, nor for the achievement of carbon neutrality. These targets are binding at global level but there is nothing binding for countries involved

and countries can use 'sinks' such as forests to achieve these targets. The key points from COP21 include:

- Governments have agreed to 'pursue efforts' to limit warming to 1.5 °C above pre-industrial levels and parties are bound to prepare and regularly update pledges to curb emissions.
- Aim to peak in emissions as soon as possible and a long-term global goal for net zero emissions in the second half of the century. Countries can use 'sinks' such as forests to do this.
- Introduction of a review mechanism to take stock of country efforts every five years. Each pledge must be 'a progression' and 'as ambitious as possible'.
- Introduction of a mechanism to recognise and address the financial losses vulnerable countries face from climate change.
- Legal obligation on developed countries to continue to provide climate finance to help developing countries adapt to climate change and transition to clean energy.
- A "facilitative, non-intransigent and non-punitive" system of review will track countries progress.
- Establishment of a "global goal" on adaptation of "enhancing adaptive capacity", strengthening resilience and reducing vulnerability to climate change.

Additionally, *inter alia*, the Paris Agreement aims to increase the ability of countries to deal with the impacts of climate change and provides for an enhanced transparency framework for action and support.

COP 26 was delayed by one year due to the Covid-19 pandemic and took place in November 2021 in Glasgow. The Glasgow Climate Pact (GCP), finalised at the end of the conference commits the Parties to an increased ambition and strengthening of emissions target to 2030 in order to align implementation to the 1.5 degrees goal of the Paris Agreement. Furthermore, a series of commitments were made to various mitigation and conservation efforts, including a deforestation pledge, a methane abatement pledge, and an agreement to end overseas financing of oil and gas projects. Increased funding support for developing nations was also agreed through the Adaptation Fund. A key achievement of COP26 was the finalising of the 'Paris Rulebook' which will allow for the full delivery of the Paris Agreement and will hold countries accountable for their emissions targets commitments. This also includes Article 6, which establishes a robust framework for countries to exchange carbon credits through the UNFCCC.

The United Nations 2030 Agenda for Sustainable Development

The 2030 Agenda for Sustainable Development is a blueprint for sustainable development for the future. At its core, are 17 Sustainable Development Goals (SDG). These recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve oceans and forests. Along with SDGs, there are targets and indicators and the Division for Sustainable Development Goals (DSDG) evaluates the systemwide implementation of the 2030 agenda. As a member of the United Nations, Ireland must display a commitment to implement the global goals. Specific SDGs that are applicable to the draft RES include:

- SDG 7 – Affordable and Clean Energy
- SDG 8 – Decent Work and Economic Growth
- SDG 9 – Industry, Innovation and Infrastructure
- SDG 11 – Sustainable Cities and Communities
- SDG 12 – Responsible Consumption and Production
- SDG 13 – Climate Action
- SDG 14 – Life Below Water

Ireland's commitment to the Paris Agreement and UN 2030 Agenda for Sustainable Development is reflected in the ambition of the RES.

6.3.1.2 European Context

The **European Green Deal** is the European Commission (EC) strategy to make the EU more sustainable by 2050, recognising climate change and degradation of the natural environment as critical threats. It has an action plan, and operates across nine policy areas, three of the key areas of relevance to the draft RES being *clean energy*, *sustainable mobility* and *climate action*.

In 2011, the EC had developed long-term goals through the *Roadmap for moving to a competitive low carbon economy in 2050*, which states the EU's target of reducing greenhouse gas emissions by 80-95% below 1990 levels by 2050. Ultimately the long-term goal of the EU is the decarbonisation of the power sector leading to a significant requirement for an increase in the contribution of renewables to the grid. As such, European goals and targets to tackle climate and energy have been set in the form of the **EU Climate and Energy Packages**. The **EU 2030 Climate and Energy Framework** continues on from the base set out from the preceding 20-20-20 Agreement, and sets new targets and measures to make the EU's economy and energy system more competitive, secure and sustainable. It sets out binding targets relating to GHG emissions, renewables and energy efficiency to be met by each Member State by 2030 as follows:

- At least 40% cut in greenhouse gas emissions (from 1990 levels);
- At least 32% share for renewable energy; and
- At least 32.5% improvement in energy efficiency.

In Europe, the current policies and national measures in place, if fully implemented, are expected to achieve a 45% emissions reduction by 2030. As part of the Green Deal, the EC proposed in September 2020, to increase the 2030 GHG emissions reduction target to at least 55% compared to 1990. The Green Deal consists of the following eight legislative texts which cover:

- Energy Performance of Buildings Directive (EPBD) (2018/844/EU);
- Renewable Energy Directive (2018/2001/EU);
- Energy Efficiency Directive (2018/2002);
- Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action;
- Electricity Directive (EU) 2019/944;
- Regulation (EU) 2019/941 on the internal market for Electricity;
- Regulation (EU) 2019/941 on risk-preparedness in the electricity sector; and
- Regulation (EU) 2019/942 establishing an EU Agency for the Cooperation of Energy Regulators(ACER).

Achieving this target requires action across all sectors. Proposals for European climate policy will need to be revised in order to achieve the 55% emission cuts by 2030. The areas to be considered include:

- EU Emissions Trading System (ETS);
- Energy Efficiency;
- Renewable Energy;
- Road transport CO₂ emissions;
- Agriculture, Land Use, Land Use Change and Forestry (LULUCF); and
- Effort Sharing.

The **2020 EU Effort Sharing Decision** commits Ireland to reducing emissions from those sectors that are not covered by the ETS (e.g. agriculture, transport, residential, non-energy intensive industry, commercial services and waste) to 20% below 2005 levels. The **Effort Sharing Regulation for 2030 (Regulation 2018/842)** sets binding annual GHG emissions targets for these sectors for the period

2021-2030. Under this regulation, Ireland must reduce its GHG emissions by 30% on 2005 levels by 2030 (or by 26.8 Mt CO₂eq).

The **Renewable Energy Sources (RES) Directive (2009/28/EC)** established the basis for the achievement of the EU's 20% renewable energy target by 2020. Each Member State was set a binding renewable energy target, to contribute to the achievement of the overall EU goal. Ireland's overall target was to achieve 16% of gross final consumption from renewable sources by 2020. For the year 2019, renewable energy in Ireland represented 12% of gross final consumption.⁶⁰ The **Recast Renewable Energy Directive (EU) 2018/2001** sets a target of at least 32% for renewable energy, at EU-wide level, with a review clause by 2023 for a potential upward revision of the EU level target. The **revised Energy Efficiency Directive (EU) 2018/2002** sets a target of at least 32.5% for energy efficiency, at EU-wide level. The EU Governance of the Energy Union and Climate Action Regulation⁶¹ sets the overall framework for the achievement of the EU climate and energy 2030 targets.

In this regard, the projected time horizon for the draft RES to 2030 and beyond is in line with EU policy and targets and will facilitate the derivation of the long-term objectives and targets aligned to EU goals.

The land use, land use change and forestry (LULUCF) sector is also increasingly being recognised as playing a large role in how GHG emissions are reported; this sector considers emissions and removals from six categories including forest land, cropland, grassland, wetland, settlements and other land. The LULUCF sector is a net carbon sink within the EU but increasing anthropogenic activities in this sector can contribute to both emissions and removals of carbon dioxide (CO₂). Due to the complexities on emissions reporting for this sector, emissions and removals from LULUCF were not counted towards the EU's 20% by 2020 GHG emissions reduction target, but count in part towards the EU's Kyoto Protocol and UNFCCC limitation of emissions and reduction commitments. **Regulation (EU) 2018/841** on the inclusion of GHG emissions and removals from LULUCF was therefore adopted in May 2018 as part of the 2030 Climate and Energy Framework. Under the regulation, Member States must ensure that GHG emissions from LULUCF are offset by at least an equivalent removal of CO₂ from the atmosphere in the period 2021-2030.

6.3.1.3 National Context

The **National Policy Position on Climate Action and Low Carbon Development (2014)** sets a fundamental national objective to achieve the transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050. In 2015, the government White Paper ***Ireland's Transition to a Low Carbon Energy Future, 2015-2030*** set the overall high-level framework for energy policy in Ireland out to 2030.

The **Climate Action and Low Carbon Development Act (2015)** provides for the approval of plans by the government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy, as well as to establish the Climate Change Advisory Council. The **Climate Action and Low Carbon Development (Amendment) Act (2021)** aims to support the country's transition to achieve a climate neutral economy by 2050. It sets out legally binding, clear targets and commitments to meet the national, EU and international climate goals and obligations. Key elements contained within the bill, include:

- Places on a statutory basis a 'national climate objective', which commits to pursue and achieve no later than 2050;
- Embeds the process of carbon budgeting into law;
- Actions for each sector will be detailed in the Climate Action Plan, updated annually;

⁶⁰ SEAI (December 2018) Energy in Ireland 2020.

⁶¹ Regulation (EU) 2018/1999 of the European Parliament and of the Council on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

- A National Long Term Climate Action Strategy will be prepared every five years;
- Government Ministers will be responsible for achieving the legally-binding targets for their own sectoral area with each Minister accounting for their performance towards sectoral targets and actions before an Oireachtas Committee each year;
- Strengthens the role of the Climate Change Advisory Council, tasking it with proposing carbon budgets to the Minister;
- Provides that the first two five-year carbon budgets proposed by the Climate Change Advisory Council should equate to a total reduction of 51% emissions over the period to 2030, in line with the Programme for Government commitment;
- Expands the Climate Change Advisory Council from eleven to fourteen members, and provides that future appointments to the Council provide for a greater range of relevant expertise and gender balanced;
- Introduces a requirement for each local authority to prepare a Climate Action Plan, which will include both mitigation and adaptation measures and be updated every five years. Local authority Development Plans will also align with their Climate Action Plan; and
- Public Bodies will be obliged to perform their functions in a manner consistent with national climate plans and strategies, and furthering the achievement of the national climate objective.

Furthermore, the revised Climate Bill proposes to ban oil and gas extraction. This would end the prospecting of fossil fuel and the future development of oil and gas fields in Ireland. A separate ban is proposed on the processing of imported fracked gas in liquefied natural gas (LNG) terminals and is to come under separate legislation.

The **Governance of the Energy Union and Climate Action Regulation (EU) 2018/1999** requires Member States to develop a **National Energy and Climate Plans (NECP)**. Ireland submitted a draft Plan to the EC in December 2018. In accordance with the Regulation, the EC and Ireland engaged in an iterative process and finalised the **NECP 2021-2030** in 2019. The aim of the NECPs is to provide an integrated policy framework for the period up to 2030 to ensure regulatory certainty and a coordinated approach among Member States. The final NECP set an ambitious target for RES-E for 70% by 2030.⁶²

Ireland's **Climate Action Plan (DCCAE, 2019)** outlined the challenges across key sectors including electricity, transport, built environment, industry and agriculture and introduced a co-ordinated approach towards ambitious decarbonisation targets which would enable Ireland to meet its EU targets to reduce its carbon emissions by 30% between 2021 and 2030 and lay the foundations for achieving net zero carbon emissions by 2050 (now superseded by revised targets of 51% reduction by 2030, see Bill of 2021 above). The **Interim Climate Actions 2021** was also published on 23 March 2021. It contains 250 climate actions for delivery, broken down into 561 measures. Responsibility for their delivery is split across 13 Government Departments and over 35 Agencies. **Interim Climate Actions 2021** formally replaces the Annex of Actions published under the Climate Action Plan 2019. The First Progress Report demonstrates a 78% delivery rate for Q1 2021, with 78 of the 100 measures due delivered on schedule. The need to overcome any delays in climate action implementation is clear, with further scientific and policy developments underscoring the need for urgent climate action.⁶³

The **Climate Action Plan 2021 (DECC, 2021)**, required under the Climate Action and Low Carbon Development (Amendment) Act 2021, was published in November 2021 and provides a sectoral roadmap to delivering the national climate objective. This Plan replaces the Climate Action Plan (2019) and commits €125 billion of capital investment in low-carbon technologies and infrastructure up to 2030. The Plan identifies 475 actions across all sectors and commits to a more ambitious delivery of renewable energy as well as a focus on the Built Environment and Transport objectives. The plan also includes a commitment to deliver a just transition and includes supports and actions to

⁶² Houses of the Oireachtas (March 2019) Report of the Joint Committee on Climate Action. *Climate Change: A Cross-Party Consensus for Action*.

⁶³ [Interim Climate Actions 2021 - Progress Report](#) [Accessed 02/06/2021]

maximise citizen engagement with the Plan including the establishment of the National Dialogue on Climate Action (NDCA).

Alongside Project Ireland 2040 (refer to **Section 6.3.4**), the government published a climate action investment strategy, **Investing in the Transition to a Low-Carbon and Climate-Resilient Society 2018-2027 (June 2018)**. Project Ireland has committed to an investment of €22 billion towards climate action over the coming decade, with the National Development Plan (NDP) allocating a further €8.6 billion for investments in sustainable mobility. The **Climate Action Fund** was also launched in 2018, with €500 million supporting the delivery of projects up until 2027.

The **2020 Programme for Government (PfG)** contains a number of key policy commitments on climate change, including a legal target of an average of a 7% reduction in carbon emissions per annum from 2021 to 2030. A future proposal is for a target of net zero emissions by 2050. It outlines the potential for at least 30GW of offshore floating wind power which could be deployed in the deeper waters of the Atlantic.

The **Renewable Electricity Support Scheme (RESS)** is a key deliverable on Ireland's transition to its low carbon future. The RESS aims to provide support to renewable electricity projects in Ireland with a focus on cost-effectiveness, and targets the delivery of a broader range of policy objectives, including:

- An enabling framework for community participation through the provision of pathways and support for communities to participate in renewable energy projects;
- Increasing technology diversity by broadening the renewable electricity technology mix (the diversity of technologies);
- Delivering an ambitious renewable electricity policy to 2030; and
- Increasing energy security, energy sustainability and ensuring the cost effectiveness of energy policy.

The RESS provides financial support to renewable electricity projects in Ireland and will provide for a RES-E ambition of up to a maximum of 55% by 2030, subject to determining the cost-effective level which are set out in the NECP 2021-2030. The first RESS auction (RESS-1) concluded in 2020.⁶⁴ The final auction results were published by EirGrid 2020.⁶⁵ Of the eighty-two projects were deemed successful (63 solar and 19 wind), two, both onshore wind projects are located in Clare. The RESS-2 auction was launched in October 2021; applications will open in December 2021 with final auction results to be announced in June 2022. The design is broadly similar to RESS-1 with additional technology diversity to include the coupling of battery storage with renewables and a stipulation projects participating in the community-led sector must be 100% community owned.

Ireland's **Offshore Renewable Energy Plan (ORED)** establishes a framework for the sustainable development of Ireland's offshore renewable energy potential. Under the ORED, Ireland is developing a suite of world class test infrastructure to encourage the development of our offshore renewable energy potential.⁶⁶ The plan was published in 2014 by the Department of Communications, Energy and Natural Resources (now the Department of the Environment, Climate and Communications [DECC]). The interim report indicates that the ORED is generally still fit for purpose given the low level of activity to date, anticipated activity projected as far as 2020, and the state of play of technology development.⁶⁷

⁶⁴ Renewable Electricity Support Scheme (RESS): <https://www.gov.ie/en/publication/36d8d2-renewable-electricity-support-scheme/>

⁶⁵ EirGrid: RESS Provisional Auction Results [https://www.eirgridgroup.com/site-files/library/EirGrid/RESS-1-Provisional-Auction-Results-\(R1PAR\).pdf](https://www.eirgridgroup.com/site-files/library/EirGrid/RESS-1-Provisional-Auction-Results-(R1PAR).pdf)

⁶⁶ Offshore Renewable Energy Development (ORED) – Interim Review, DOECC (2018) | <https://www.gov.ie/en/publication/e13f49-offshore-renewable-energy-development-plan/> (Accessed 02/06/2021)

⁶⁷ Offshore Renewable Energy Development (ORED) – Interim Review, DOECC (2018) | <https://www.gov.ie/en/publication/e13f49-offshore-renewable-energy-development-plan/> (Accessed 02/06/2021) (Accessed 02/06/2021)

In October 2021 the Government launched the first consultation on the **Offshore Renewable Energy Support Scheme (ORESS-1)** with the aim to engage stakeholders before the launch of the scheme which will see three auctions deliver up to 5 GW of offshore wind energy projects.

The Renewable Energy Directive (2009/28/EC) required Ireland to adopt a **National Renewable Energy Action Plan (NREAP)**. Ireland's plan was submitted to the EC in 2010 and established a 16% RES target in 2020 for Ireland that would be delivered by achieving three modal targets as follows:

- 40% renewable share of electricity use (RES-E);
- 12% share of renewable heat (RES-H); and
- 10% renewable share of transport energy (RES-T).

Table 6.3.1 shows the progress on the renewable energy targets by mode in Ireland.

Looking ahead to 2030, the proportion of energy from renewable sources will have to dramatically increase to meet EU targets under the Recast RES Directive, which is part of the **EC's Clean Energy for All Europeans Package**, and which are to be incorporated as part of Member States' NECPs. While the national target has not yet been finalised, **Table 6.3.1** below present a possible set of targets across electricity, heat and transport sectors, following the 'With Additional Measures' projection set out in the NECP 2021-2030.

Table 6.3.1: National Renewable Energy Targets

RES Target	Ireland 2019 (%)	Target 2020 (%)	Possible Target 2030 (%) ⁶⁸
Overall RES Target	12	16	34.1
RES-E	36.5	40	70 ⁶⁹
RES-H	6.3	12	24
RES-T	8.9	10	13.4

In 2018, the Government published the statutory **National Adaptation Framework (NAF)** which sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. Under the Framework, Government Departments are required to prepare **Sectoral Adaptation Plans (2018/2019)** for key sectors. Local Authorities are also required to prepare Adaptation Strategies and the Framework provides a basis for local authorities and key sectors to assess their key climate risks and vulnerabilities while enabling climate resilience actions to be mainstreamed into all local, regional, and national policymaking. The **Climate Change Adaptation Plan for the Electricity and Gas Networks Sector** was published by DCCAE in February 2018. It is a high-level plan which outlines the initial research and analysis on the likely effects of climate change on these sectors and sets out possible actions to develop resilience.

The **National Policy on Alternative Fuels Infrastructure for Transport 2017-2030** was published by DTTAS reiterating the cornerstones of Irish transport policy which includes key goals such as reducing reliance on fossil fuels and reducing transport emissions. Utilising alternative fuels is a key aspect of this and for contributing to decarbonisation of the electricity sector. It outlines the main fuel options that could provide alternatives to oil in transport namely: electricity, hydrogen, biofuels, and natural gas, in the forms of compressed natural gas (CNG), liquefied natural gas (LNG), and liquefied petroleum gas (LPG). Ireland set an initial target in 2008 of converting 10% of its passenger and light commercial vehicle stock to electric vehicles by 2020 (roughly equivalent to 230,000 vehicles).

As the uptake of EVs was lower than anticipated, this target was revised to 50,000 in Ireland's **third National Energy Efficiency Action Plan (NEEAP 3)** published in 2014. The target for EV uptake

⁶⁸ National Energy and Climate Plan 2021-2030 . Table 5. [Accessed 22/02/2021]

⁶⁹ Note – Since the publication of the NECP targets, under the Climate Action Plan 2021, Ireland's national RES-E target has increased from 70% to 80%.

was revised to 20,000 electric vehicles by 2020 by this framework, which is reflected in **NEEAP 4 (2017-2020)**. In line with the ambition of the NDP, the EV stock reached approximately 500,000 by 2030.⁷⁰ The **amending EU Directive on Energy Efficiency (2018/2002)** sets a collective EU efficiency target of at least 32.5% for 2030, with the NECP 2021-2030 aiming to contribute to this through a suite of measures including in the public sector and in buildings, among others.

The use and specification of biofuels in the transport sector is dictated by the **RES Directive** and the **Fuel Quality Directive (2009/30/EC)**. Under Article 3(4) of the Renewable Energy Directive, Ireland is committed to ensuring that at least 10% of energy consumption in the transport sector is achieved from renewable sources by 2020. The Recast RES Directive notes that each Member State shall set an obligation on fuel suppliers to ensure that the share of renewable energy within the final consumption of energy in the transport sector is at least 14% by 2030 (minimum share). **Table 6.3.1** presents a possible set of targets nationally for the transport sector of 13.4%. In 2015, new rules came into force that amended these directives **RES** and **Fuel Quality Directive** to reduce the risk of indirect land use change and to prepare the transition towards advanced biofuels. The amendment:

- Limits the share of biofuels from crops grown on agricultural land that can be counted towards the 2020 renewable energy targets to 7%;
- Proposes a specific sub-target of at least 0.5% for advanced biofuels in road and rail energy from 2021, rising to 3.6% in 2030;
- Requires that biofuels produced in new installations emit at least 60% fewer GHGs than fossil fuels; and
- Introduces stronger incentives for the use of renewable electricity in transport.

The Wind Energy Development Guidelines (2006,) and the Draft Wind Energy Guidelines (2019) set out advice to planning authorities on planning for wind energy through the development plan process and in determining applications for planning permission. They guidelines ensure consistency of approach throughout the country in the identification of suitable locations for wind energy development. The Guidelines are currently under in Draft review to establish clearer guidance to facilitate the achievement of wider renewable energy targets while considering community, spatial planning, energy policy, environmental, technological and industry issues that need to be balanced. The newly emerged “preferred draft approach” focuses on several key aspects including:

- Sound/ Noise;
- Visual Amenity Setback;
- Shadow Flicker;
- Consultation Obligations;
- Community Dividend; and
- Grid Connections.

Finalised Guidelines are proposed to be issued in 2022 and will thereafter be issued under the PDA and will apply to planning applications and considerations for future wind energy development proposals. These guidelines are of direct relevance to the RES in terms of the key environmental aspects to be considered as part of wind energy development, such as noise and shadow flicker considerations, as well as setback distances.

To date, there is no national guidance for the planning and development of solar photovoltaic (PV) developments in Ireland. In 2016, Future Analytics produced a report funded by the SEAI, **Planning and Development Guidance Recommendations for Utility Scale Solar Photovoltaic Schemes in Ireland (October 2016)**. This report sets out planning policy and development guidance and recommendations which could then be used to inform any Section 28 planning guidance or departmental circular on utility-scale solar PV developments. The report sets out its recommendations under the headings of forward planning recommendations, development management recommendations, and other recommendations. Solar PV is another key area being considered under the RES for potential to contribute to large-scale renewable electricity development. Like the

⁷⁰ SEAI national energy projections. Available at: <https://www.seai.ie/publications/National-Energy-Projections-to-2030.pdf>

Wind Energy Guidelines, future guidelines may arise concerning solar PV which may have implications for the RES and its policy base. The report states that in 2016, applications had been granted permission or were under determination/on appeal for an estimated 594 MW of solar PV generation potential, covering a combined estimated area of 1,331.9ha.

At the county level, a key guidance documents comprises the **Methodology for Local Authority Renewable Energy Strategies [LARES] (SEAI, 2013)** which is a comprehensive document designed to provide local authorities with guidance, template and reference points for the preparation of a RES, and also to facilitate consistency in their approach across Ireland. The preparation of the draft RES has therefore had regard to this methodology.

6.3.2 Electricity and Grid

The national grid is a nationwide electricity transmission network that consists of both overhead and underground high voltage power cables. County Clare is exceptionally well served by the grid with two existing 400kV lines providing a high capacity path for power flows from Moneypoint to the east of Ireland. In addition, there is an extensive 220kV and 110kV network.

The **EirGrid 2020 – 25 Strategy** is shaped by climate change and the transition of the electricity sector to low-carbon, renewable energy. The transmission network is undergoing a transformation to account for the integration of renewable energy and the implementation of technological innovation. This requires necessary infrastructure and operation requirements to facilitate the shift to a more sustainable energy future across the island of Ireland. The introduction of variable renewable forms of generation on the network adds complex demand and supply issues, these include^[1]:

- The operational challenges of more variable, non-synchronous generation sources;
- Security of supply in managing increasing number of generation technology types; and
- Integration and use of Smart Grid technologies.

Shaping our Electricity Future (EirGrid, 2021) details innovative approaches to developing the grid in order to meet ambitious 2030 renewable energy targets. Specifically, it must redevelop the grid to manage 70% of Ireland's electricity coming from renewable sources by 2030.

Ireland's Grid Development Strategy, Tomorrow's Energy Scenarios 2019: System Needs Assessment - Planning Our Energy Future (EirGrid, July 2019), follows the 2008 long-term **Grid25 Strategy** to develop Ireland's electricity grid. In this updated strategy presents the latest analysis of Ireland's electricity sector covering the next 20 years. The report identifies three possible scenarios: A plan-led world in which Ireland achieves a low carbon future; a world in which the pace of change is not sufficient to meet climate objectives; and one where citizens recognise climate change as a risk and take appropriate action. It forecasts a significant increase in demand for electricity and in weather-dependent renewable energy sources across all three scenarios:

- **Scenario 1: Centralised Energy** - A plan-led scenario in which Ireland achieves a low carbon future;
- **Scenario 2: Delayed Transition** - A scenario in which decarbonisation progress is made, but the pace is not sufficient to meet climate objectives; and
- **Scenario 3: Coordinated Action** - A scenario where sustainability is a core part of decision making. Government and citizens recognised climate change as a risk and take appropriate action.

The RES needs to consider the status and capacity of the grid, identified projects, and the implications for developing and connecting renewable (particularly large-scale) electricity projects. It is acknowledged that there are uncertainties regarding future grid capacity, given the growth in large energy consumers, such as data centres and other high-energy users, particularly in the ICT sector. The report also notes that the EU Clean Energy Package has established a right for renewable electricity self-consumers to sell excess renewable electricity production. It is expected that this legislation will be transposed into Irish law in 2021.

^[1] <https://www.eirgridgroup.com/how-the-grid-works/renewables/>

The **All-Island Ten Year Transmission Forecast Statement 2019 (EirGrid & SONI, 2020)**, prepared jointly by EirGrid and SONI, describes the transmission system on the island of Ireland from 2019 to 2028. The statement notes that data centres now represent significant demand connections in Ireland. In order to meet our commitments, investment will be needed in new renewable generation capacity and electricity networks. The transition to low-carbon and renewable energy will have widespread consequences, indeed it will require a significant transformation of the electricity system. The report contains mapped areas of potential generation opportunities at various substation circuits. This is of relevance to the RES in terms of understanding current and forecasted electricity demands, similar to the System Needs Assessment.

The **National Policy Statement on Electricity Interconnection (DCCAE, 2018)** follows the early 2018 public consultation held over the early months of 2018 on the draft policy. The policy statement is designed to provide high-level policy guidance to all stakeholders, in particular, to the Commission for Regulation of Utilities (CRU), as it considers applications from project promoters. Consideration of interconnectors will be important in terms of increasing import and export capacity, and increased connectivity with the UK (Greenlink) and the continent (Celtic Interconnector).

The **Draft Grid Implementation Plan (IP) 2017-2022 (EirGrid, 2018)** reviews the first Grid IP published in 2012 to support the continued development of a safe secure and reliable transmission system in Ireland. This is largely based on the EirGrid Development Strategy (Your Grid, Your Tomorrow 2017). The draft Grid IP identifies, at a strategic level, key developments in the transmission system to take place over the next few years and highlights 3 key strategy statements to ensure a balanced approach to grid development:

- Inclusive consultation with local communities and stakeholders will be central;
- Consideration of all practical technology options; and
- Optimising the existing grid to minimise the need for new infrastructure.

In February 2020, EirGrid also published their Transmission Development Plan 2019-2028 (Public consultation closed on 21st May 2021 for the Draft EirGrid Transmission Development Plan 2020-2029). It presents a plan for the development of the Irish transmission network and interconnection over the ten years from 2019.

The RES needs to consider the status and capacity of the grid and identified projects, and the implications for developing and connecting (particularly large-scale) RE projects.

6.3.3 Sustainability

Since 2015, Ireland has been a signatory to the **United Nations Sustainable Development Goals (SDGs)**, which frame national agendas and policies to 2030. The SDGs build on the UN Millennium Development Goals and have a broader agenda that applies to all counties. These goals are mirrored through EU strategies such as Horizon Europe and the European Regional Development Fund (ERDF) which emphasise smart, sustainable and inclusive growth; see **Figure 6.3-1**. Sustainability is at the heart of long-term planning therefore it is important that the SDGs are integrated into the Irish planning hierarchy from the top tier down.



Figure 6.3-1: United Nations Sustainable Development Goals [Source: United Nations]

In October 2020, the EC published a proposal for the **EC's 8th Environmental Action Programme [EAP] to 2030**, which would support and build on the environmental aspects of the Green Deal to 2050. It has six priority objectives:

- Restoring biodiversity and enhancing natural capital/ ecosystems;
- Achieve greenhouse gas reduction targets and for the EU to be climate neutral by 2050;
- Enhance adaptiveness and increase resiliency to the effects of climate change;
- To decouple economic growth from resource use and therefore degradation of the environment, while transitioning to a circular economy;
- Aiming for a zero-pollution environment and to protect the health and wellbeing of all Europeans; and
- To reduce pressures on the environment and the climate from consumption/production, namely industry, energy, buildings, infrastructure, mobility and food systems.

The draft RES should continue to contribute to the national effort of achieving the SDGs and the priorities of the EAP in its efforts to implement climate action at county scale as well as contributing to the national effort.

6.3.4 Spatial Planning

Project Ireland 2040 is the government's long-term strategy for sustainable development in Ireland to 2040. It is comprised of the **National Planning Framework (NPF)** and the **National Development Plan (NDP) 2018-2027**. These sit at the top of the spatial planning hierarchy, driving national policy and investment priorities.

The NPF sets out a high-level vision to shape the future growth and development of Ireland to 2040 and expressed as 10 National Strategic Outcomes (NSOs) - a shared set of national goals and benefits that the plan can deliver if implemented according to the identified National Policy Objectives (NPOs); see **Figure 6.3-2**. NSO 8 aims to facilitate the *Transition to a Low Carbon and Climate Resilient Society*. The capital investment priorities rising from this strategy represent a major change in Ireland's delivery of climate-action objectives to achieve sufficient reductions in carbon emissions during the period to 2030, including:

- Upgrading of 45,000 homes a year from 2021;
- An additional 3,000-4,500 MW of renewable energy;

- Full rollout of the Renewable Heat Support Scheme;
- Transition to low-emission - including electric - buses for the urban bus fleet; and
- A target of 500,000 electric by 2030.



Figure 6.3-2: National Strategic Outcomes [Source: NPF, DHPLG]

The RES will need to be cognisant of these targets set out under Project Ireland 2040. In particular, decarbonising the various sectors i.e. electrification of transport, can only be achieved if there is a proportional increase in electricity generated from renewable sources to offset increased demands on the sector.

A related plan is Ireland's **National Marine Planning Framework [NMPF]** which represents Ireland's first step in developing marine spatial planning in Ireland. A marine spatial plan is required under the **Maritime Spatial Planning Directive (2014/89/EU)** and was prepared by the DHLGH and published in June 2021. The NMPF will stand as a parallel framework to the terrestrial NPF in order to fully align spatial planning. The RES should have regard to the objectives of the NMPF and the associated environmental assessments as they relate to coastal, transitional and marine areas.

At the regional level, the NPF together with the NDP sets the context for each of Ireland's three regional assemblies to develop the **Regional Spatial and Economic Strategies [RSES's]** for the Eastern & Midlands Region, Southern Region, and Northern & Western Region. Local and county development planning must take account of the RSES's in a manner to ensure that national, regional and local plans align. One of the principle functions of the RSES's is to practically support and advance the delivery of the NPO's and NSO's contained in the NPF at the regional level, and to inform lower-level planning. The three regional assemblies aim to bring forward the NPF in a manner which best reflects the challenges and opportunities of their respective regions. Each of the regional assemblies have policies relating to promotion and increased roll-out of renewable energy sources. The Southern Region's Strategy is to build a low carbon, climate resilient and sustainable society. It contains the following key relevant Regional Policy Objectives (RPOs) in relation to renewable energy are reproduced as follows:

- **RPO 95 - Sustainable Renewable Energy Generation:** It is an objective to support implementation of the National Renewable Energy Action Plan (NREAP), and the Offshore Renewable Energy Plan and the implementation of mitigation measures outlined in their respective SEA and AA and leverage the Region as a leader and innovator in sustainable renewable energy generation.

- **RPO 96 - Integrating Renewable Energy Sources:** It is an objective to support the sustainable development, maintenance and upgrading of electricity and gas network grid infrastructure to integrate renewable energy sources and ensure our national and regional energy system remains safe, secure and ready to meet increased demand as the regional economy grows.
- **RPO 97 - Power Stations and Renewable Energy:** It is an objective to support the sustainable technology upgrading and conversion of power stations in the Region to increase capacity for use of energy efficient and renewable energy sources.
- **RPO 98 - Regional Renewable Energy Strategy:** It is an objective to support the development of a Regional Renewable Energy Strategy with relevant stakeholders.
- **RPO 99 - Renewable Wind Energy:** It is an objective to support the sustainable development of renewable wind energy (on shore and offshore) at appropriate locations and related grid infrastructure in the Region in compliance with national Wind Energy Guidelines
- **RPO 100 - Indigenous Renewable Energy Production and Grid Injection:** It is an objective to support the integration of indigenous renewable energy production and grid injection.
- **RPO 101 - International Hub for Energy Innovation:** It is an objective to support continued innovation and research in the energy sector and to develop a role as an international hub for energy innovation.
- **RPO 102 - Energy Research Funding:** It is an objective to support initiatives for energy research funding within our Region to accelerate diversification away from fossil fuels to green energy, including the potential of wind, wave, solar, biomass, biofuels, biogas and hydrogen in the Region.
- **RPO 103 - Interconnection Infrastructure:** It is an objective to support the sustainable development of interconnection infrastructure, in particular the potential for the sustainable development of an international connection between Ireland and France in the Region.
- **RPO 104 - Energy Storage and Carbon Capture:** It is an objective to support investment in initiatives to develop innovation, advances in technology and pilot projects for the sustainable development of energy storage and carbon capture within the Region and to work with key stakeholders in developing sustainable forestry, including initiatives for native tree planting and better management of peatland and soil management to support carbon sequestration and enhancement of biodiversity.
- **RPO 105 - Clean Electric Heat Technologies & District Heating:** It is an objective to support development of district heating schemes by promoting innovation in the use of recoverable heat sources and related technologies. The development of new low carbon heat sources should include non-fossil fuel heat sources including clean electric and renewable gas heat technologies in the Region.
- **RPO 106 - Future Proofing and Retrofitting:** It is an objective to support implementation of the National Energy Efficiency Action Plan, the implementation of mitigation measures outlined in their respective SEA and AA and investment in initiatives to improve energy efficiency and future proof our Region's residential, commercial, industrial, agricultural and public building stock, including retrofitting in urban and rural areas and reduce fuel poverty. RSES supports the promotion of sustainable buildings that achieve certification under systems such as the Home Performance Index, Leadership in Energy and Environmental Design at local authority level.

Other relevant RPOs include the following:

- | | |
|--|--|
| • RPO 41 - Atlantic Economic Corridor (AEC) | • RPO 58 - Bio-economy and Rural Areas |
| • RPO 46 - Digital and Physical Infrastructure in Rural Areas | • RPO 76 - Marine Economy |
| • RPO 50 - Diversification | • RPO 77 - Maritime Spatial Planning Consistency and Alignment |
| • RPO 56 - Low Carbon Economy | • RPO 78 - First Mover under the National Marine Planning Framework |
| • RPO 57 - Bio-economy | |

- RPO 79 - Shannon Estuary and Other Harbour Plans
- RPO 80 - Marine Resource and Blue Economy
- RPO 85 - Renewable Offshore Energy
- RPO 87 - Low Carbon Energy Future
- RPO 89 - Building Resilience to Climate Change
- RPO 91 - Decarbonisation in the Transport Sector
- RPO 92 - Electric Vehicle Infrastructure
- RPO 93 - CNG & EV Infrastructure
- RPO 94 - Decarbonisation in the Agricultural Sector
- RPO 108 - EU Action Plan for the Circular Economy
- RPO 109 - Bio-Energy Implementation Plan

The **Strategic Integrated Framework Plan for the Shannon Estuary (SIFP) 2013-2020** is “an inter-jurisdictional land and marine based framework plan to guide the future development and management of the Shannon Estuary”. The aim of this plan is to identify the potential nature and location of future development, economic growth and employment that can be sustainably accommodated within the Shannon Estuary whilst protecting the environmental sensitivities of the area. The plan also identifies the potential of the estuary for renewable energy development. The RES should therefore have regard to the SIFP in developing its objectives.

At national level, the **Wind Energy Development Guidelines [WEDG's] (2006)**, issued under Section 28 of the Planning and Development Act [PDA] 2000 (as amended) set out advice to planning authorities on planning for wind energy through the development plan process and in determining applications for planning permission. The guidelines aimed to ensure consistency of approach throughout the country in the identification of suitable locations for wind energy development. In December 2019, the then-named Department of Housing, Planning and Local Government (DHPLG) published **Draft Revised WEDG's (2019)** which aim to establish clearer guidance to facilitate the achievement of wider renewable energy targets while considering community, spatial planning, energy policy, environmental, technological and industry issues that need to be balanced. The “preferred draft approach” focuses on several key aspects including:

- Sound/ Noise;
- Visual Amenity Setback;
- Shadow Flicker;
- Consultation Obligations;
- Community Dividend; and
- Grid Connections.

Once finalised, the Revised WEDG's will be issued under the PDA and will apply to planning applications and considerations for future wind energy development proposals. These guidelines are of relevance to the RES in terms of the key environmental aspects to be considered as part of wind energy development, such as noise and shadow flicker considerations, as well as setback distances.

6.4 Key Environmental Influences

6.4.1 Nature Conservation

Ireland is a party to the **UN Convention on Biological Diversity** and is therefore committed to measures to conserve biodiversity. The measures include conservation of ecosystems, habitats and species in their natural surroundings both inside and outside protected areas, conservation of the components of biological diversity outside their natural habitats and impact assessment.

The **EU Biodiversity Strategy to 2020** aimed to halt the loss of biodiversity and the degradation of ecosystems in the European Union (EU) by 2020. The new **Biodiversity Strategy to 2030** aims to put Europe's biodiversity on the path to recovery by 2030 for the benefit of people, climate and the planet. In the context of the post-COVID-19 pandemic, it aims to build resilience to future threats, including climate change, security of food supplies, forest fires, outbreaks of disease and combating

the illegal trade in wildlife. It aims to increase the Natura 2000 network, and will launch an EU restoration plan by the end of 2021. To enable implementation, it also aims to allow better tracking of progress, improving knowledge transfer and emphasising 'respect for nature' in public and business decision-making.

The **Habitats Directive (92/43/EC)** and the **Birds Directive (2009/147/EC)** are transposed into Irish law principally through the **Birds and Natural Habitats Regulations 2011, as amended**, which consolidates the **Natural Habitats Regulations 1997 to 2005** and the **Birds and Natural Habitats (Control of Recreational Activities) Regulations 2010** which provide for high-level European protection. Article 6 of the Habitats Directive requires that any plan or project, (which includes the RES) be screened for Appropriate Assessment to determine if it, alone or in combination with other plans and projects, is likely to have a significant effect on a European Site. This screening has been undertaken in parallel to development of the draft RES and it was concluded that a Stage 2 Appropriate Assessment was required due to the potential for impacts arising from the RES. Further detail can be found in the Natura Impact Report (NIR) prepared under separate cover.

At a national level, protection and conservation is outlined in the **National Biodiversity Plan** and the **National Parks and Wildlife (NPWS) Conservation Plans for SACs and SPAs**. Ireland's third **National Biodiversity Action Plan 2017-2021** outlines Ireland's vision for biodiversity protection and management. The **National Peatlands Strategy** has been developed to give direction to Ireland's approach to peatland management including bog conservation and restoration, over the coming decades. In addition to this strategy, the NPWS have published the **National Raised Bog Special Areas of Conservation (SAC) Management Plan 2017-2022** outlines the approach to be taken specifically for the conservation and management of the 53 raised bog SAC sites.

County Clare itself has a **Biodiversity Action Plan 2017-2023**, which relates the national objectives of the National Biodiversity Action Plan to the county. Its key aims are to:

- "To implement the actions of Ireland's National Biodiversity Action Plan 2017-2021 as they relate to County Clare;
- To inform all biodiversity projects undertaken as part of the County Clare Heritage Plan 2017-2023 and support its full implementation;
- To ensure the Clare County Biodiversity Action Plan 2017-2023 fully informs all planning policy within the County, including the biodiversity objectives in the Clare County Development Plan 2017-2023;
- To produce best practice guidelines on biodiversity conservation and management for all sections of Clare County Council;
- To ensure that all projects carried out under the Clare County Biodiversity Action Plan 2017-2023 comply with the requirements of the Habitats Directive, and all other legislation as appropriate."

The RES should continue to contribute to the protection of biodiversity and the wider environment by continuing to identify potential impacts on biodiversity through policies that focus on avoidance of impacts in in first instance and the proper siting and monitoring of RE projects.

6.4.2 Land Use

The EC's 8th Environmental Action Program (EAP) to 2030 has acknowledged that degradation of soil is a serious problem. However, despite the importance of soil, there is little in the way of direct EU or national legislation obliging Ireland to maintain soil quality however, indirectly, issues such as contaminated land have been dealt with through other legislation (e.g. waste, major accidents and hazards), and in the absence of a dedicated legislative framework, EU soil protection policy is shaped by the **EU Soil Thematic Strategy**. In December 2020, the EC published the **Roadmap for a New Soil Strategy - Healthy Soil for a Healthy Life**, in order to address soil and land degradation and to achieve land degradation neutrality by 2030. In 2021, the EC adopted the **Zero Pollution Action Plan for Air, Water and Soil**. *Soil Health and Food* form one of the EU Mission Areas which are commitments to contribute to the goals of the European Green Deal. The **Soil Health and Food Mission** has set a target for 2030 that at least 75% of all soils in the EU are healthy or show a significant improvement towards meeting accepted thresholds of indicators. In Ireland, some soil protection legislation has been enacted including the **2011 EIA Regulations for On Farm Development** which includes a requirement for EIA of soil operations such as soil drainage.

With regard to peatlands, **Bord na Móna's National Peatlands Strategy (2015)** was developed by to give direction to Ireland's approach to peatland management including bog conservation and restoration, over the coming decades. **Bord na Móna's Biodiversity Action Plan (BAP) 2016-2021** also builds on the first BAP which covered the period 2010-2015. It frames its policy objectives in the context of biodiversity management of peatlands, bog restoration as well as conservation. It also considers the outlook for Bord na Móna as set out in Sustainability 2030 Report (October 2015).

The agri-food sector is a growing sector within Ireland and **Food Wise 2025** outlines the key actions to ensure that this sector maximises its contribution to agricultural growth and exports. Achieving the objectives within Food Wise 2025 has the potential to apply increased pressure on the environment in localised areas through the intensification of farming. The successor strategy will be the **Agri-Food Strategy to 2030**, and is currently being prepared by DAFM.

The common set of objectives, principles and rules through which the European Union co-ordinates support for European agriculture is outlined in the **Rural Development Programme (RDP) 2014-2020** under the **Common Agricultural Programme**. The 2014-2020 *Rural Development Programme* (RDP) contains a suite of measures and has been designed to enhance the competitiveness of the agri-food sector, achieve more sustainable management of natural resources and ensure a more balanced development of rural areas. The next programming period will cover 2021-2027 and will also emphasise sustainable use of resources as part of Ireland's new **CAP Strategic Plan 2023-2027**, which is currently being prepared by DAFM.

Within the RDP is a substantial targeted Agri-environment scheme, the **Green Low Carbon Agri-Environment Scheme (GLAS)** which includes measures for the protection of water to mitigate against climate change and to promote biodiversity. In a related environmental aspect, Ireland is also obliged under the **Nitrates Directive 91/676/EEC** to prepare a **National Nitrates Action Programme (NAP)** to protect water quality from pollution by agricultural sources and to promote good farming practice. The **Good Agricultural Practice for Protection of Waters Regulations 2006 (S.I. No. 378/2006)**, as amended, give legal effect to the NAP and directly contribute to the protection of water quality and meeting the objectives of the WFD. Ireland's fourth NAP is in place until 2021. the **Fifth NAP** is in preparation by DHLGH and will cover the period 2022-2025.

Ireland's forestry sector is striving to increase forestry cover and one of the recommended policy actions in the **Forest Policy Review: Forests, Products and People – A Renewed Vision (DAFM, 2014)** is to increase the level of afforestation annually over time and support afforestation and mobilisation measures under the **Forestry Programme 2014-2020**. The increase in forestry is a key measure nationally to mitigate climate change within the agricultural sector. Historically there have been forestry practices that have contributed to water quality issues such as release of suspended solids, acidification of water courses, loss and disturbance of riverine habitat. These issues have been acknowledged and are gradually being amended through changes to forestry management practices, but legacy issues remain. The latest forestry policy makes provision for the management of existing forests and the development of the forestry sector, whilst ensuring compliance with environmental requirements and objectives. Two key objectives within the Forestry Programme 2014-2020 that will potentially influence the RES are to increase Ireland's forest cover to 18% and to establish 10,000 ha of new forests and woodlands per annum.

Land use is an important consideration for the RES as there is often competition for adequate land space between different sectors which the RES must be cognisant of.

6.4.3 Human Health and Wellbeing

Healthy Ireland 2015-2025 is the HSE's framework strategy for improving health and wellbeing. The main aims of Healthy Ireland therefore are to: increase the numbers of people experiencing good health (mental and physical) at all life stages; reduce health inequalities with a focus on social factors; protect the public and increase preparedness for threats to public health; and to encourage every individual and society as a whole to collaboratively engage with its own health and wellbeing. In relation to RE development and in the context of the draft RES, the aspects that could impact health include for example, noise during construction/operation of RE development, air emissions from biomass combustion, shadow flicker from turbines etc.

The EU also has a directive regarding the control of major accident hazards, commonly known as the **Seveso III Directive (2012/18/EC)**. This was transposed into Irish law through the **Control of Major Accident Hazards Involving Dangerous Substances (COMAH) Regulations 2015 (S.I. No.**

209/205). The aims are to prevent major accident hazards involving dangerous substances and chemicals and the limitation of their consequences for people and the environment. Local authorities implement the provisions of the directive in conjunction with the Health and Safety Authority (HSA). Seveso sites are defined as industrial sites which, because of the presence of sufficient quantities of dangerous or hazardous substances, must be regulated under this EU directive. If there are planning applications for development occurring within a certain distance of the perimeter of a Seveso site, the HSA provides appropriate advice to the planning authorities in respect of development within a distance of these sites. Seveso sites are categorised as Upper Tier or Lower Tier depending on the size of the site and the quantities of dangerous/hazardous material present. There are three such sites in County Clare, including at Shannon Airport and Moneypoint.

6.4.4 Air Quality

The **Gothenburg Protocol 1999 (as amended)** is part of the **Convention on Long-Range Transboundary Air Pollution (CLRTAP)** and aims to control and reduce local and long-range air pollution. The protocol is enacted in **Regulation (EU) 2016/2284** on the reduction of national emissions of certain atmospheric pollutants, repealing the first **National Emissions Ceiling Directive [NECD] (2001/81/EC)** and replacing it with a **new NECD (2016/2284/EU)**. The new NECD specifies a reduction of national emissions of certain atmospheric pollutants and sets national reduction commitments from 2020 to 2029 and from 2030 onwards for five pollutants: sulphur oxides (SO_x), nitrogen oxides (NO_x), fine particulate matter (PM_{2.5}), non-methane volatile organic compounds (NMVOCs), and ammonia. These are responsible for long-range transboundary air pollution such as acidification, eutrophication and ground-level ozone pollution. These revisions came about from a comprehensive review of EU air quality policies which resulted in the **EU Clean Air Package**, adopted in December 2013.

The **Ambient Air Quality and Cleaner Air for Europe [CAFE] Directive (2008/50/EC)** sets out the requirements for ambient air quality to protect human health and the environment as a whole; it replaced the Air Framework Directive and the First, Second and Third Daughter Directives. The **Fourth Daughter Directive (2004/107/EC)** will be included in CAFE at a later stage (covering polyaromatic hydrocarbons, arsenic, nickel, cadmium and mercury in ambient air). The CAFE Directive has been implemented in Ireland through the **Air Quality Standards Regulations 2011 (S.I. No. 180/2011), as amended**, and the Fourth Daughter Directive via **S.I. No. 58/2009, as amended**. These regulations set ambient air quality limits and target values for air pollutants. The World Health Organisation (WHO) also publish **Global Air Quality Guidelines** for PM, ozone, nitrogen dioxide (NO₂) and sulphur dioxide (SO₂), with the latest revision published in 2020. The WHO guidelines contain stricter air quality limits than the EU directives. The **Stockholm Convention** on persistent organic pollution (POP's) entered into force in Ireland in 2010, requiring that the state protect human health and the environment from POP's.

Air quality in Ireland is regulated both at the local level through ambient air quality limits and at the national level through emission ceilings. Ireland's reporting under the NECD is part of the **National Air Pollution Control Programme (NAPCP)**. In April 2017, Ireland published the draft **National Clean Air Strategy**. It aims to *'provide the strategic policy framework necessary to identify and promote the integrated measures across government policy that are required to reduce air pollution and promote cleaner air while delivering on wider national objectives.'* Some of the recommendations arising from stakeholder consultation include tackling road transport-related nitrogen oxide emissions, monitoring of ammonia emissions from agriculture and taking action on residential solid fuel use and shipping emissions (DCCA, 2017). Ireland also has a **National Ambient Air Quality Monitoring Programme 2017-2022**.

The current challenge to air quality from increased particulates is from the transport sector which is the biggest contributors (diesel and petrol burning in combustion engines). Both through the Clean Air Strategy and the **National Policy Framework on Alternative Fuels Infrastructure for Transport (Department of Transport, 2019)** have identified measures to move transportation away from fossil fuel sources. In the offshore space, shipping is the key source of air pollution, which is currently regulated by the **MARPOL Convention**, specifically Annex VI which limits the main air pollutants from ships, SO_x, NO_x, PM, and prohibition of the deliberate release of ozone-depleting substances. Incineration on ships and emissions of VOCs are also regulated. The objectives are for progressive reductions in air pollution from shipping. In 2020, new limits on the sulphur content in ship fuels aims to further significantly reduce SO_x emissions.

The RES should have consideration for these air quality plans and programmes in the preparation of its objectives.

6.4.5 Noise

Environmental noise is unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport (road, rail and air traffic), and from sites of industrial activity including the categories of activities specified in Annex I to the Industrial Emission Directive (2010/75/EU). Regulation of noise comes under the remit of the **Environmental Noise Directive [END] (2002/49/EC)**, with the requirement for member states to produce noise maps and compile noise action plans based on those maps. It was amended by **Directive (EU) 2015/996** establishing common noise assessment methods. END is transposed in Ireland through the **Environmental Noise Regulations 2018 (S.I. No. 549/2018)**. Local authorities publish **Noise Action Plans** on a regular basis. The most recent Noise Action Plan for Clare was published in 2018. Nuisance noise is dealt with under the **Environmental Protection Agency Act 1992, as amended**.

In October 2018, the World Health Organisation (WHO) published **Environmental Noise Guidelines for the European Region (2018)**. Key sectoral sources of noise are noted to include transport (road, rail and air traffic), wind turbine noise and leisure noise. These guidelines provide health advice, and outlines recommended exposure levels for the European Region for those sources. The two recommendations for wind turbine noise are noted as follows:

- For average noise exposure, the GDG [Guideline Development Group] conditionally recommends reducing noise levels produced by wind turbines below 45 dB Lden, as wind turbine noise above this level is associated with adverse health effects; and
- To reduce health effects, the GDG conditionally recommends that policy-makers implement suitable measures to reduce noise exposure from wind turbines in the population exposed to levels above the guideline values for average noise exposure. No evidence is available, however, to facilitate the recommendation of one particular type of intervention over another.

At national level, revised guidelines on noise in relation to wind energy as covered as part of the Draft revised WEDG's (2019); refer to **Section 6.3.4** above.

Noise emissions can be generated during the construction and operation of RE infrastructure i.e. turbines during operation, substations during operation etc. These noise emissions can be controlled by a range of mitigation measures including control of noise at the source. As such, the RES will need to be cognisant of these noise limits in the context of identifying RE targets and capacity, particularly in the context of the receiving environment.

6.4.6 Water and Flooding

The **Water Framework Directive [WFD] (2000/60/EC)** is the key instrument for protecting and improving the aquatic environment and as such it applies to surface water bodies such as rivers, lakes, estuaries, coastal waters, as well as groundwater bodies. Member states are required to achieve at least good status in all waters and must ensure that status does not deteriorate, with a requirement for water quality management to be centred on river basin districts (RBDs). A key development in meeting the requirements of the WFD has been the publication of **River Basin Management Plans (RBMPs)** which have provided a coordinated approach to water management throughout across Europe and in Ireland. The second cycle RBMP covers the period 2018-2021 and its Programme of Measures is being implemented by local authorities to allow for the protection of at least good status, or the restoration of good status, for all water bodies. The outcomes are then monitored in order to feed into further characterisation and setting of measures as the cycle moves forward. The third cycle RBMP is in preparation and will cover the period 2023-2029 and is due to be published in December 2021.

Similarly for marine waters, the **Marine Strategy Framework Directive [MSFD] (2008/56/EC)** has adopted an ecosystem-based approach to protect and manage the marine environment. This forms an integral component of maritime spatial planning within the EU and requires Member States to develop a strategy to achieve or maintain good environmental status (GES) in their marine waters by 2020. Ireland has developed an MSFD Programme of Measures that aims to meet the targets set in

order to achieve or maintain GES. Refer also to **Section 6.3.4** above on Spatial Planning for information on the **National Marine Planning Framework [DHLGH]**).

Floods are a natural and inevitable part of life that can pose a risk to human life and well-being, property and the environment, and this includes coastal areas, and related impacts from climate change, sea level rise and erosion. Flood risk can be minimised or avoided on land to a degree through careful selection of areas for development. The Office of Public Works (OPW) is responsible for the implementation of the **Floods Directive (2007/60/EC)** which is being carried out through the **Catchment-based Flood Risk Assessment and Management Studies (CFRAMS)**. The OPW undertook Preliminary Flood Risk Assessments to identify areas of existing or potentially significant future flood risk and to prepare flood hazard and risk maps for these areas. Following this, **29 Flood Risk Management Plans** were developed for these areas setting objectives for managing the flood risk and setting out a prioritised set of measures to achieve the objectives. The protection measures from each of the plans form a national priority list which will inform the development of a programme of implementation for capital works. A number of Areas for Action are located within Clare.⁷¹ The work to date as part of CFRAMS has had a direct strategic influence on land use planning and siting of developments, ensuring that future infrastructure growth is positioned in the appropriate locations, taking flood risk into account.

The RES should continue to contribute to the fulfilment of the environmental protection objectives required under the above directives, and by the avoidance of RES infrastructure in flood zones through supporting appropriate planning and development.

6.4.7 Landscape and Cultural Heritage

The **National Landscape Strategy for Ireland (2015-2025)** was produced in line with Ireland's obligations under the European Landscape Convention. The strategy aims to assist with future decision-making processes in Ireland, ensuring that decisions are made on the basis of factual evidence collected and that there is consistency in the decision making across the country. It outlines six key objectives and actions, one of which is to develop a National Landscape Character Assessment (LCA). It proposed that LCA's would be prepared at local and intra-local authority level however, there has been limited to no progress on developing these for all counties. It is intended that these regional and local landscape character assessments would inform and guide landscape policy, action plans and local authority development plans.

The Southern RSES has a policy to prepare a regional LCA which should also address the characterisation of seascapes and coastal areas, once a national LCA has been completed. This signifies a policy gap which persists at national level, as while there is a desire to co-ordinate LCAs at the regional level, there is no specific NPO under the NPF which commits to undertaking a national LCA. The **Landscape Character Assessment of County Clare (2004)** sets out the LCAs in the county. A Seascape Character Assessment (SCA) was also carried out. At national level, more recently, in 2020 the Marine Institute published a **Draft Regional Seascape Character Assessment** for Ireland for consultation.⁷² While County Clare has an LCA and SCA, the absence of a national/regional approach which ensures consistency across local authorities represents a policy and data gap. While the landscapes/seascapes of Clare are outlined and mapped, as RE can have significant impacts on a landscape as well as cultural and historical setting and character, RE developments would need to have cognisance of adjoining local authorities with no such LCA or SCA.

Culture 2025 is a policy framework which sets the vision for the future of culture and the arts in Ireland and prioritises actions. It recognises the diverse and multi-faceted nature of culture in Ireland and the contribution of 'culture' to sense of self, national identity and the arts. The Government has also commenced development on the successor to the National Heritage Plan (2002-2007), **Heritage Ireland 2030**.

Investing in our Culture, Language and Heritage 2018-2027 is the Government's ten-year plan outlining the integrated approach to supporting Ireland's culture, language and heritage. The plan identifies the need for high quality infrastructure to support this area and highlights the importance of

⁷¹ OPW Publications – Flood Risk Management Plans Available at: <https://www.floodinfo.ie/publications/?t=22>

⁷² Marine Institute – Definition and Classification of Ireland's Seascapes: <https://emff.marine.ie/blue-growth/definition-and-classification-ireland%E2%80%99s-seascapes>

investment in our cultural heritage as a means to support social cohesion and a strong, sustainable economic growth. The heritage priorities identified include: investment in nature reserves and national parks; caring for our historic environment; celebrating and investing in built heritage; caring for national monuments; and protecting natural heritage and biodiversity.

Archaeology 2025 is a strategy published by the Royal Irish Academy which sets out a vision for action for the coming years. It notes that all artefacts have legal status and all sites and monuments are protected for future generations. It sets out priority pillars of action to ensure that archaeology remains a central part of Ireland's heritage.

At county level, the **County Clare Heritage Plan 2017-2023** recognises the rich built, cultural and natural heritage of the county. Its key aims are to:

- “Identify, manage and conserve heritage for the benefit of all;
- Collect and make available heritage information;
- Raise awareness through education initiatives;
- Acquire knowledge through surveys and research;
- Inform public policy on heritage; and
- Support the strategic and integrated management of heritage at a local level.”

These documents all recognise that heritage comprises both the built and natural landscapes, which are key environmental considerations for the draft RES.

6.4.8 Waste

The EU's first **Circular Economy Action Plan** was completed in 2019, with much progress made on its 54 actions. The new Circular Economy Action Plan was published in March 2020 and forms one of the pillars of the European Green Deal. Ireland's own **Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025**, recognises the challenge of climate change and materials consumption. In 2014, the EPA published **Green Procurement Guidance for the Public Sector**. This guidance helps inform public bodies by giving a practical overview across eight priority sectors of green procurement issues.

In 2020, the Department of Environment, Climate and Communications (DECC) launched a new national waste policy, **A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025**. It builds on Ireland's previous national waste policy, *A Resource Opportunity – waste management policy in Ireland*. The new action plan puts the focus on waste management further up the waste hierarchy, shifting away from disposal and treatment of waste towards circular product design, and reducing materials consumption. The plan has over 200 measures across various sectors including the circular economy transition, protection of consumers, green procurement, plastics and packaging, municipal waste etc.

The preparation of **Regional Waste Management Plans (RWMPs)** are a requirement of the **Waste Management Act 1996, as amended**. The three RWMPs for the Eastern-Midlands Regional, Southern Region and Connaught-Ulster Region were published in 2015 and cover the period to 2021. They provide a framework for the prevention and management of wastes for the three defined regional areas, including hazardous waste. As part of the next review cycle of waste management planning, the three RWMPs will be consolidated into one national plan which is due for preparation starting in 2021, and will continue to be supported and implemented by the three Regional Waste Management Authorities. The EPA is also required to prepare a **National Hazardous Waste Management Plan (NHWMP)** under the Waste Management Act. The third NHWMP covers the period 2014-2020. The fourth NHWMP is being prepared and will cover the period 2021-2027. It aims to reduce and prevent the generation of hazardous waste, improve collection, improve education and awareness, and support effective regulation.

As the draft RES aims to increase RE sources, there is potential for projects to require earthworks, or to encounter contaminated sites which material would require appropriate management and/or treatment.

7 ENVIRONMENTAL PROTECTION OBJECTIVES AND SEA FRAMEWORK FOR ASSESSMENT

Strategic Environmental Assessment, as its name suggests, is set at a strategic level, therefore it is not possible for the baseline environment to be described (and assessed) in as much detail as could be done for a project-level EIA. Instead, SEA uses a system of objectives, targets and indicators to set a framework for assessment of the plan.

In order to streamline the assessment process, this report has used broad themes, based on the environmental topics listed in the SEA Directive, to group large environmental datasets, e.g., human health, cultural heritage and climate. Assigned to each of these themes is at least one high-level Strategic Environmental Objective (SEO) that specifies a desired direction for change, e.g. reduce CO₂ emissions, against which the future impacts of the plans can be measured.

7.1 Development of Strategic Environmental Objectives

7.1.1 Strategic Environmental Objectives

There are essentially three types of objectives considered as part of this SEA. The first relates to the objectives of the draft RES. The second relates to wider environmental objectives, i.e. environmental protection objectives at a national, European and international level, and finally there are the SEOs, which were devised to test the effects of the draft RES on the wider environment.

Establishing appropriate criteria for the assessment of the effects of the draft RES started at scoping stage where a series of proposed SEOs and guide questions were developed. These SEOs are based on the objectives included in the SEA for the CCDP 2023-2029 (refer to **Appendix B**) where relevant and the current understanding of the key environmental issues identified as well as the indicative list of environmental protection objectives outlined in the document, *Implementation of SEA Directive 2001/42/EC (DECLG, 2004)*. Selection was also based on consultation with statutory consultees during the scoping stage and discussions between the SEA, AA and RES Team.

These objectives and questions are reflective of the extent of the assessment criteria listed in the SEA Directive; the scope of the draft RES; wider environmental protection objectives at a national, European and international level (identified in **Chapter 6**); consultation feedback from scoping; and the baseline information collated in **Chapter 5**. Each of the draft RES alternatives and the draft RES objectives have then been assessed against these SEOs to establish whether they contribute (or not) to achieving the desired outcomes. The selected SEOs for this SEA are set out in **Table 7.1.1**.

Table 7.1.1: Strategic Environmental Objectives and Framework for Assessment

Related to SEA Topic(s)	Relevant SEA CDP Objective 2023-2029	Strategic Environmental Objective	To what degree will the draft RES ensure...
Population and Human Health (PHH)	P1 – Protect, enhance and improve people's quality of life based on high quality residential, community, educational, working and recreational environments and on sustainable travel patterns.	PHH1 – Ensure that renewable energy (RE) developments are planned, constructed and operated in a manner that avoids or minimises adverse impacts on local residents/communities (including their quality of life) and maximises the community benefit of such developments	No significant deterioration in human health as a result of environmental factors. Compliance with requirements for set-back distances from wind energy developments (Revised Wind Energy Development Guidelines (to be published)). Provision of security of energy supply to residents in County Clare. Provision of community gain through RE developments Encourage improved energy efficiency.
	P2 - To protect human health from hazards or nuisances arising from incompatible land uses/developments.	PHH2 – To protect human health from hazards or nuisances arising from incompatible RE-related land uses/developments.	No significant deterioration in human health as a result of changes to environmental factors. Protection of drinking water from indirect impacts associated with developing RE projects Reduce population exposure to high levels of noise from RE development. Compliance with requirements for set-back distances from wind energy developments (Revised Wind Energy Development Guidelines (to be published)).
Biodiversity, Flora and Fauna (BFF)	B1 – Protect, conserve, maintain and, where appropriate, enhance terrestrial, aquatic and soil biodiversity, avoiding the loss of diversity and integrity of a broad range of habitats, species and wildlife corridors.	B1 – Protect, conserve, enhance where possible and avoid loss of diversity and integrity of the broad range of habitats, species and wildlife corridors in line with the Birds and Habitats Directives in line with the Birds and Habitats Directive.	Provide effective protection of designated sites for habitats and species.
	B3 – Conserve and protect other sites of nature conservation including NHAs, pNHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries as well as protected species outside these areas as covered by the Wildlife Act.	B2 – Conserve and protect other sites of nature conservation including NHAs, pNHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries as well as protected species outside these areas as covered by the Wildlife Act	Provision of effective protection and conservation to NHAs, pNHAs, Nature Reserves, Wildlife Sanctuaries and Habitats Directive Article 10 sites. Provision of effective protection and conservation to species protected under the Wildlife Act. Protection of habitats from unnecessary disruption from RE development.

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Related to SEA Topic(s)	Relevant SEA CDP Objective 2023-2029	Strategic Environmental Objective	To what degree will the draft RES ensure...
	B4 – To minimise and, where possible, eliminate threats to bio-diversity including invasive species.	B3 – To minimise and, where possible, eliminate threats to bio-diversity including invasive species.	Avoidance of spread or introduction of invasive species as a result of RE projects. Contribution towards the protection of habitats from invasive species.
	B5 – Promote green infrastructure networks, including riparian zones and wildlife corridors.	B4 – Promote green infrastructure networks, including riparian zones and wildlife corridors as part of RE developments.	Promotion of green infrastructure within RE applications
Water (W)	W1 – Protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem (quality, level, flow).	W1 – Protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem (quality, level, flow).	Protection of habitats and species by ensuring RE development does not alter their water needs in terms of water quality, flow rates, levels etc
	W2 – Maintain or improve the quality of all surface waters and groundwater (including estuarine and marine water) in line with the requirements of the Water Framework Directive and the objectives of the National River Basin Management Plan with particular emphasis on restoring our high status waters through the Blue Dot Catchment Programme.	W2 – Maintain or improve the quality of all surface waters and groundwater (including estuarine and marine water) in line with the requirements of the Water Framework Directive, the National Marine Planning Framework and the objectives of the National River Basin Management Plan with particular emphasis on restoring high status waters through the Blue Dot Catchment Programme.	Achieve or maintain at least Good Status, and no deterioration of existing status, for surface and groundwater bodies in line with the requirements of the WFD and the National River Basin Management Plan by 2027. Contribute to achieving and maintaining Good Environmental Status for marine waters in line with the requirements of the MSFD, and under the National Marine Planning Framework.
	W3 – Promote Sustainable Drainage Systems (SuDS) across the County. (Attenuate, innovate, reuse, reimagine & utilise water in a different way)	W3 – Implement appropriate sustainable drainage systems (SuDS) in the various renewable energy projects	New drainage systems for any renewable energy projects to be compliant with SuDs.
	W4 – Reduce the impact of polluting substances to all waters and prevent pollution and contamination of ground water by adhering to aquifer protection plans and to maintain and improve the quality of drinking water supplies.	W4 – Avoid the impact of polluting substances from any RE developments to all waters and prevent pollution and contamination of groundwater by adhering to aquifer protection plans and to maintain and improve the quality	Achieve or maintain at least Good Status, and no deterioration of existing status, for surface and groundwater bodies in line with the requirements of the WFD and the National River Basin Management Plan by 2027.
	W6 – Protect flood plains and areas of flood risk from development through avoidance, mitigation and adaptation measures.	W5 – Protect flood plains and areas of flood risk from RE development through avoidance, mitigation and adaptation measures.	In accordance with OPW and the Flood risk and Management Guidelines 2009, ensure RE developments do not contribute to flood risk.
Land and Soils (Geology) (LS)	S1 – To maximise the sustainable re-use of the existing built environment, derelict, disused and infill sites (brownfield sites), rather than	S1 – To maximise the sustainable re-use of the existing built environment, derelict, disused and infill sites (brownfield sites),	Preference for development on brownfield site over green field.

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) ENVIRONMENTAL REPORT (ER)

Related to SEA Topic(s)	Relevant SEA CDP Objective 2023-2029	Strategic Environmental Objective	To what degree will the draft RES ensure...
	greenfield sites. <i>(This is in line with the Active Land Management Strategy RPO34 – Regeneration, Brownfield, Infill Development)</i>	rather than greenfield sites for RE development. <i>(This is in line with the Active Land Management Strategy RPO34 – Regeneration, Brownfield, Infill Development)</i>	Limited and controlled development of greenfield sites. Avoid incidences of soil contamination.
	S2 – Minimise the excavation and movement of soils within site works	S2 – Minimise the excavation and movement of soils within site works associated with RE developments.	Soils is reused on site where possible. Limit the amount of excavation in sensitive locations for example peat excavation in wind farm sites. Ensure sustainable extraction of non-renewable sand, gravel and rock deposits and the reuse and recycling of construction and demolition waste.
	S3 – Minimise the consumption of non-renewable deposits on site.	S3 – Minimise the consumption of non-renewable deposits on site.	Re-use of soils from redeveloped sites where possible
	S4 – Minimise the amount of waste to landfill from site.	S4 – Minimise the amount of waste to landfill from RE development in line with the waste management hierarchy.	Reduction in the quantities of waste sent to landfill. Increase in the quantities of waste sent for recycling and recovery. Compliance with national and regional waste planning and Ireland's National Waste Policy 2020-2025.
	S5 – Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites.	S5 – Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites.	Avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites
		S6 – No contribution to landslide or slope instability from renewable energy development.	Minimise potential for disruption to, and loss of, sensitive soil and land resources. Avoid topographically unsuitable areas.
		S7 – Protect against the displacement of agricultural food crops.	Protection of agricultural food crop area.
Climatic Factors (including air quality) (CF)	C1 – Meet relevant air and noise standards and support initiatives to reduce air and noise pollution	C1 – Meet relevant air and noise standards and support initiatives to reduce air and noise pollution	Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030 and Climate Action Plan (2019). Facilitate the introduction and construction of infrastructure to support the renewable energy sector. Achieve transition to a competitive, low-carbon, climate-resilient and environmentally sustainable

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Related to SEA Topic(s)	Relevant SEA CDP Objective 2023-2029	Strategic Environmental Objective	To what degree will the draft RES ensure...
			economy by 2050 in line with the Climate Action Plan (2019)
	C2 – Contribute towards a reduction of Greenhouse Gas Emissions in line with relevant targets.	C2 – Contribute towards a reduction of Greenhouse Gas Emissions in line with relevant targets.	Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030
		C3 – Contribute to mitigation of, and adaption to climate change	Contribute to reducing GHG emissions Maximise the use of renewable energy resources and reduce the dependency on fossil fuels Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030 No increase in flood risk from RE development Protection of biodiversity from potential impacts from climate change
Climate Change-Mitigation Measures (CCM)	CC2 – Decrease the usage of fossil fuels and increase both renewable resource usage and protection together with a move towards more low carbon energy sources	CC2 – Decrease the usage of fossil fuels and increase both renewable resource usage and protection together with a move towards more low carbon energy sources	Facilitate implementation of sustainable modes of transport (i.e. provision of charging points) Increase in renewable energy developments Reduction on use of fossil fuels Promote the use of renewable and sustainable resources (i.e. biomass, AD, offshore wind, hydro and geothermal energies) Improve efficiency of energy infrastructure
	CC3 – Integrate Climate Change mitigation measures into every fabric of spatial planning through the restriction of inappropriate development/land-use zoning in flood risk zones, inclusion of green infrastructure as the status quo and the incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all developments	CC3 – Integrate Climate Change mitigation measures into every fabric of spatial planning through the restriction of inappropriate development/land-use zoning in flood risk zones, inclusion of green infrastructure as the status quo and the incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all developments	Avoidance of inappropriate development of RE infrastructure in sensitive areas i.e. flood risk zones Incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all RE developments
	CC4 – Maintain and protect our natural carbon sinks (bogs/marshes/forests/fens) as decarbonising areas which can serve a dual purpose in terms of enhancement of biodiversity and mitigation against Climate Change	CC4 – Maintain and protect our natural carbon sinks (bogs/marshes/forests/fens) as decarbonising areas which can serve a dual purpose in terms of enhancement of biodiversity and mitigation against Climate Change	Protection of carbon sinks

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Related to SEA Topic(s)	Relevant SEA CDP Objective 2023-2029	Strategic Environmental Objective	To what degree will the draft RES ensure...
Climate Change-Adaptation Measures (CCA)	CC5 – Encourage and support the utilisation of energy-efficient and water-efficient building design to better equip homes and businesses to cope during times of shortage and service interruption, such as grey-water recycling, the use of solar PVs, passive houses etc.	CC5- Encourage and support the utilisation of energy-efficient and water-efficient building design to better equip homes and businesses to cope during times of shortage and service interruption, such as grey-water recycling, the use of solar PVs, passive houses etc.	Promote the use of renewable and sustainable resources in building design (i.e. solar, passive houses) Improve energy efficiency of infrastructure
	CC6 – Encourage the retrofitting of buildings with a particular focus on the existing council housing stock ensuring a Just Transition for all.	CC6 – Encourage the retrofitting of buildings with a particular focus on the existing council housing stock ensuring a Just Transition for all.	Improve energy efficiency of existing infrastructure
Cultural Heritage (CH)	CH1 – Protect and conserve the cultural heritage including the built environment and settings; archaeological (recorded and unrecorded monuments), architectural (Protected Structures, Architectural Conservation Areas, vernacular buildings, materials and urban fabric) and manmade landscape features (e.g. field walls, footpaths, gate piers etc.) of the county.	CH1 – Protect and conserve the cultural heritage including the built environment and settings; archaeological (recorded and unrecorded monuments), architectural (Protected Structures, Architectural Conservation Areas, vernacular buildings, materials and urban fabric) and manmade landscape features (e.g. field walls, footpaths, gate piers etc.) of the county.	No permitted renewable energy developments which involves loss of cultural heritage, including protected structures, archaeological sites, Architectural Conservations Areas and landscape features
	CH3 – To ensure the restoration and re-use of existing uninhabited and derelict structures where possible opposed to demolition and new build (to promote sustainability and reduce landfill).	CH2 – To ensure the restoration and re-use of existing uninhabited and derelict structures where possible opposed to demolition and new build (to promote sustainability and reduce landfill).	Re-use of existing buildings as opposed to demolition or new buildings
Landscape (LandS)	L1 – Ensure no significant disruption of historic/cultural landscapes and features, through objectives of the County Development Plan.	L1 – Ensure no significant disruption of historic/cultural landscapes and features, through objectives of the RES.	Ensure no significant disruption of historic/cultural landscapes, seascapes and features through objectives of the RES.
	L2 – Ensure there is no significant visual impact from development on both landscapes and seascapes.	L2 – Ensure there is no significant visual impact from RE development on both landscapes and seascapes	No significant visual impact from development.
Material Assets - Transport	T1 – Maximise sustainable modes of transport and encourage use of walkways/cycle paths as alternative routes to school, work, and shops.	T1 – Maximise sustainable modes of transport and encourage use of renewable transport technologies.	Facilitation in the implementation of sustainable modes of transport (i.e. provision of charging points) Uptake of renewable transport technologies

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) ENVIRONMENTAL REPORT (ER)

Related to SEA Topic(s)	Relevant SEA CDP Objective 2023-2029	Strategic Environmental Objective	To what degree will the draft RES ensure...
Material Assets - Waste	WA1 – Implement the waste pyramid and encourage reuse/recycling of material wherever possible.	WA1 – Implement the waste pyramid and encourage reuse/recycling of material wherever possible.	Reduction in the quantities of waste sent to landfill from Renewable energy projects Increase in the quantities of waste sent for recycling from renewable energy projects. Compliance with the Southern Region Waste Management Plan and Irelands National Waste Policy 2020-2025.
Material Assets - Water Supply	WS1 – To ensure adequate and clean drinking water supplies.	WS1 – To ensure adequate and clean drinking water supplies.	Ensure RE infrastructure does not negatively impact on water supply
Material Assets - Renewable Energy	RE1 – Reduce waste of energy, promote use of renewable energy sources and support energy conservation initiatives across all sectors including the development of low carbon business practices and buildings.	RE1 – Reduce waste of energy, promote use of renewable energy sources and support energy conservation initiatives across all sectors including the development of low carbon business practices and buildings.	Increase in renewable energy developments. Contribute to improved energy efficiency.

8 ALTERNATIVES

The consideration of alternatives is a requirement of the SEA Directive (2001/42/EC). Article 5(1)⁷³ states that: “Where an environmental assessment is required under Article 3(1), an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated.”

The term ‘reasonable’ is not defined in the legislation. Good practice points to the analysis of ‘alternatives’ as being a constructive and informative exercise for the policy makers, and that only ‘possible’ options are examined. Alternatives are required to take into account the objectives of the RES. The alternatives study therefore must operate within the strategic objectives, set out for the RES, and provide an examination of alternative means of implementing the RES.

The SEA Directive does not prescribe at what stage consideration of alternatives should be undertaken, however, to present a useful input into the plan making process, all guidance points to considering alternatives as early as possible. Guidance also recognises that multiple layers of alternatives may exist, particularly for plans/ development frameworks of this nature.

Three principle guidance documents have been referenced in the development of alternatives:

- Implementation of SEA Directive (2001/42/EC): Assessment of the Effects of Certain Plans and Programmes on the Environment, DEHLG 2004;
- Developing and Assessing Alternatives in Strategic Environmental Assessment, EPA 2015; and
- Good Practice Note on SEA for the Energy Sector (EPA, March 2021).

Early discussion of possible alternatives was undertaken during the scoping stage for the RES. This chapter of the Environmental Report considers the reasonable alternatives which have been developed through the evolution of the draft RES. Given the nature of the RES, alternatives have been focussed at the strategic level, and also consider spatial, modal and temporal aspects.

8.1 Approach to Alternatives for the RES

Alternatives can be described as a range of options available to the plan makers for delivering on the objectives of the RES, as well as alternatives within the plan itself. The identification of alternatives enables more informed decision-making and the assessment allows more sustainable options to be identified. The alternatives to be considered must be realistic, reasonable and relevant. It is anticipated that the environmental report will explore alternatives at a number of levels: strategic, policy actions, GIS analysis and environmental mapping overlays, etc.

Recent EPA guidance on development of alternatives will provide a framework for development of alternatives; **Table 8-1-1** adapts Figure 10-1 from the EPA report *Good Practice Note on SEA for the Energy Sector* (EPA, March 2021) on possible approaches to alternatives with example considerations for the RES. The alternatives were developed by the SEA and RES team and were presented to and discussed with key members of Clare County Council.

Key considerations by Clare County Council and RPS in the development of each alternative strategy were identified and incorporated in the description of each alternative. They key considerations include:

- **Community Acceptance of Energy Infrastructure:** Key issues include community consultation at an early stage, raising awareness of renewable energy and linking to health, well-being and social and economic development.
- **Economic Impact and Job Creation:** Impacts on economic development through increased economic activity as measured by Gross Value Added. The creation of new supply chains or the expansion of existing systems. Job creation is also an important criterion of economic activity.
- **Energy Security and Climate Change:** Capacity of the project(s) to contribute to alternative and sustainable energy supply that will reduce the counties and/or Ireland's dependence upon

⁷³ Directive 2001/42/EC On the assessment of effects of certain plans and programmes on the environment, EC 2001

imported fossil fuels. The ability to displace fossil fuels will also reduce the CO₂ emissions associated with energy use and impact upon regional and national commitment on carbon reductions.

- **Energy Infrastructure Capacity / Development:** Capacity of the grid to accept the levels of electricity capable of being generated by renewable means; requirement for close liaison with EirGrid in regard to Grid 25 Strategy, project proximity to grid connection.
- **Land Use Change:** A growing demand for fuel to serve the renewable energy industry (e.g. woodland and energy crops as biomass) may change agricultural practices and create new demands on rural areas.
- **Ecological and Environmental Impact:** Impacts on designated sites, flora, fauna, air, water, soil and peat.
- **Landscape Characteristics:** Issues surrounding an established landscape character and the potential visual impacts.

As part of the development of alternatives RPS undertook a series of workshops to consider reasonable, implementable and realistic options to see how County Clare could achieve meeting the renewable energy targets set for Ireland. **Table 8.1.1** provides an overview of the emerging options that were considered throughout these workshops by the SEA team, the RES team and representatives from Clare County Council. Potential alternatives were also issued to the key stakeholders for feedback and their comments/recommendations were taken on board in the development of the alternatives.

The reasonable alternatives are discussed and assessed in **Sections 8.2 to 8.4** below.

Table 8.1.1: Potential Approaches to the Development of the Alternatives for the RES

Alternative Type	Description	Example Considerations with respect to the RES
Strategic	<i>High-level options that achieve a given objective. These types are commonly realistic only at policy level.</i>	<p>Do Nothing – this alternative would mean that the 2015 RES is not updated or incorporated into the 2023-2029 CDP.</p> <p>Business as Usual- More renewable electricity projects, gradual change to renewable heating systems, gradual progress to renewable transport energy, continuation of the existing RES progress. Development of renewable energy largely led by private companies.</p> <p>National Pathway- Clare would achieve its share the national targets across renewable energy sectors. More aggressive decarbonisation of heat and transport in particular. Would include for example:</p> <p>Greater deployment of renewable electricity on land incl. further onshore wind and solar and associated electricity grid projects.</p> <p>Electrification of heating and transport creating the need for localised electricity grid upgrades. Switching over to electric heat pumps in homes and business.</p> <p>Increased use of biofuels/ biomass in both transport and industry.</p> <p>Wide uptake of micro-generation and community energy.</p> <p>Maximise Renewable Resources- Going beyond the national targets to achieve greater decarbonisation, linked to enterprise and industrial development by creating a stable and reliable low-carbon energy environment. Similar to 'National pathway' but with more large-scale renewable electricity projects both onshore and offshore.</p> <p>More rapid decarbonisation of heat and transport.</p> <p>More emphasis on energy conversion and energy systems integration – e.g. using battery storage, hydrogen electrolyzers, and pumped-hydro energy storage systems.</p> <p>Attracting energy-intensive employment (e.g. Data Centres) to form part of a low-carbon energy network.</p>

Alternative Type	Description	Example Considerations with respect to the RES
Spatial/ Geographical	<i>Alternative locations for the implementation of planning objectives.</i>	<p>Marine Sector Priority – more renewable infrastructure to develop tidal, wave and offshore wind capacity. Would include more off-shore cabled/ grid, more foreshore works, and more industry in coastal areas</p> <p>On-Shore Focus – greater use of wind, solar, and biomass resources. Will include land use changes, more utility-scale renewables and energy integration and storage installations.</p>
Modal	<i>Different technical/ mode alternatives to achieve the same objective</i>	<p>Different technical/ mode alternatives to achieve the same objective can be considered under the 3 main target headings of Electricity (E), Heat (H) and Transport (T).</p> <p>Alternatives may include:</p> <p>RES-Electricity: Onshore Wind v Onshore Solar</p> <p>RES – Heat: Bioenergy focus – growing more energy crops and more district heating and biomass boilers, more AD (biogas) plants possibly with District Heating, versus Electricity Focus – fewer landuse implications (strengthening of electricity distribution network, more rooftop solar PV, more heat pumps) Gas grid focus – decarbonisation of gas grid – more AD plants, hydrogen facilities e.g. near wind farms. Use of CHP in centralised heat systems, possibly with District Heating.</p> <p>RES-Transport Electric Vehicle focus: this is the preferred national approach for car fleet. Biofuel focus: possible alternative for HGVs and similar larger vehicles: implications more growing of biofuels (e.g. oilseed rape), more AD plants (biogas), more importation of bio-ethanol and biodiesel.</p>
Sectoral and/ or Temporal Prioritisation	<p><i>Alternatives that look at sectoral feasibility and needs at the strategic level, policies can be formulated to promote one sector versus another.</i></p> <p><i>Alternatives for the timing of implementation of plan/ programme measures.</i></p> <p><i>These are most suitable at the local level for addressing infrastructure development.</i></p>	<p>Sectoral Contribution:</p> <p>Utility Scale Sector Renewables (e.g. large installations of wind, solar, biomass) supplying the electricity grid, versus</p> <p>Community (e.g. community owner solar, wind projects) and Household sector (e.g. microgeneration of renewable energy in households, with some feed-in of excess energy to the grid)</p> <p>Other alternatives that look at sectoral and temporal feasibility could include:</p> <p>Consideration of alternatives which are not currently feasible in this 2nd iteration of the plan but may become feasible/ economically viable in the future e.g. tidal power, advanced biofuels.</p> <p>Consideration of the timing of different modes of renewable energy throughout the life-time of the RES i.e. Onshore wind and Solar in earlier years and offshore towards the later years</p>

8.2 Strategic

Three options were considered under Strategic as described in **Section 8.2.1 to 8.2.3** and assessed in **Section 8.3.4**.

8.2.1 Alternative 1A – Do Nothing

This alternative would mean that the Draft RES is not incorporated into the CDP. It would remain as a strategic document that would not impact on land use policy.

For the do-nothing alternative the level and scale of renewable energy projects will be almost entirely determined by external policy at regional / national level and external market forces. However this approach removes most of the local control in the decision making process and relies on external agencies or developers to drive the agenda for sustainable low carbon energy resources. The reliance on external agencies and organisations would also place County Clare at a distinct disadvantage to other counties that are taking a far more proactive stance in the area of low carbon communities and commerce. This alternative relies solely on the market/ economic activity and investment decisions which would respond to the forces of supply and demand for green energy. Such approach would lack the benefit of proper planning and may result in oversupply of a particular renewable energy product or technology or the provision of such technologies at unsuitable locations. Alternatively, it may result in stagnation of RE growth and heavier reliance on fossil fuels.

It was considered that this alternative may have moderate community acceptance, moderate impact on energy infrastructure and land use change and it could perform poorly in terms of job creation and energy security and climate change.

8.2.2 Alternative 1B – National Renewable Targets

Under this option Clare would achieve its share the national targets across renewable energy sectors (See Table 2.1 of the RES). More aggressive decarbonisation of heat and transport in particular are required. It would include for example:

- Greater deployment of renewable electricity on land incl. further onshore wind and solar and associated electricity grid projects.
- Electrification of heating and transport creating the need for localised electricity grid upgrades.
- Switching over to electric heat pumps in homes and business.
- Increased use of biofuels/ biomass in both transport and industry.
- Wide uptake of micro-generation and community energy.

This alternative would not challenge Clare in relation to renewable electricity, but still represents a significant challenge in heat and transport sectors.

8.2.3 Alternative 1C – Maximise Renewable Resources

This option would mean the RES would go beyond the national targets to achieve greater decarbonisation, linked to enterprise and industrial development by creating a stable and reliable low-carbon energy environment. Similar to alternative 1B above, but with:

- More large-scale renewable electricity projects both onshore and offshore.
- More rapid decarbonisation of heat and transport.
- More emphasis on energy conversion and energy systems integration – e.g. using battery storage, hydrogen electrolyzers, and pumped-hydro energy storage systems.
- It could also lead to attracting energy-intensive employment (e.g. Data Centres) to form part of a low-carbon energy network.

This alternative represents a more forward-looking and enterprise oriented approach to renewable energy. It would require more innovation and a willingness to accept greater levels of change in both onshore energy systems and a welcome for large scale off-shore renewables projects.

8.2.4 Assessment of Options

Table 8.2.1: SEA Assessment of Strategic Alternatives

Alternative	PHH	BFF	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
1A-Do Nothing	+/-	-	-	-	+/-	+/-	+/-	-	-	+/-	Such approach would lack the benefit of proper planning and may result in oversupply of a particular renewable energy product or technology or the provision of such technologies at unsuitable locations impacting on BFF/W/LandS and CH. Alternatively, it may result in stagnation of RE growth and heavier reliance on fossil fuels and a result have negative impacts on AQ. There is the possibility that community gain would be low and that security of supply in relation to the residents in County Clare would not be guaranteed. However there still could be job creation. Without significant drive in relation to plans and policies there is the possibility that renewable energy targets may not be met and that reduction in GHGs would not be extensive in meeting targets.
1B- National RE Targets	+/-	+/-	+/-	+/-	+	+	+	+/-	+/-	+	<p>Whilst this alternative is favourable in relation to meeting national renewable energy targets there are uncertainties in the potential impacts that each type of technology could have on the environment in order to meet these targets.</p> <p>In contrast this alternative will have a positive impact to PHH/MA/CF/CCM/CCA as it aims to meet the national targets, contribute to further improving energy efficiency, security of supply, creation of employment and reduction of GHG emissions. Whilst negative impact to BFF may occur due to the RE infrastructure long term positive impacts may occur due to reduced burning of fossil fuels and reducing (albeit at a low level) impacts to climate change and the indirect effects to BFF.</p>
1C- Maximise Renewable resource	+/-	+/-	+/-	+/-	+	+	+	+/-	+/-	+	Similar to 1B above this alternative is favourable in relation to meeting national renewable energy targets, reducing GHG emissions and ensuring self-sufficiency in supply. However, there are uncertainties in the potential impacts that each type of technology could have on the environment in order to meet these ambitious targets. There is potential for greater impacts on the natural environment associated with this option as a higher proportion of RE infrastructure will be required to over achieve on

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Alternative	PHH	BFF	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
											<p>targets. In contrast this alternative will have a more positive impact to PHH/MA/CF/CCM/CCA as it will not only meet the national targets but contribute to further improving energy efficiency, security of supply, creation of employment. Whilst negative impact to BFF may occur due to the RE infrastructure long term positive impacts may occur due to reduced burning of fossil fuels and reducing (albeit at a low level) impacts to climate change and the indirect effects to BFF. Maximising RE infrastructure may also have negative effects on land use and landscape capacity to absorb change associated with the RE infrastructure if not planned, site and monitored appropriately.</p>

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AC* – Air Quality, *CF* Climatic Factors; *CCM* – Climate Change Mitigation, *CCA* Climate Change Adaptation, *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

8.3 Temporal/Prioritisation

8.3.1 Alternative 2A – Onshore Priority

This option would prioritise the development of onshore RE infrastructure including solar, wind, hydro, biofuels etc. As it utilises tried and trusted approaches, it involves less risk and uncertainty.

8.3.2 Alternative 2B – Marine (Offshore) Priority

This option would prioritise the development of offshore RE infrastructure and primarily focus on off-shore wind farms in combination with smaller wave and tidal installations tidal. Under this approach, the long term delivery of large scale offshore energy would be seen as preferable to continued prioritisation of onshore energy which brings land use and environmental pressures.

8.3.3 Alternative 2C – Combination of Onshore plus Planning for Offshore

This option would prioritise the development of onshore RE infrastructure only including solar, wind, hydro, biofuels etc. in the short-medium term, but would plan for much more extensive offshore renewable energy in the offshore in the long term (post 2030). The only elements of onshore development that would be considered as part of this option would be the associated ancillary works to grid connection and the ports.

8.3.4 Assessment of Options

Table 8.3.1: SEA Assessment of Temporal/Prioritisation Alternatives

Alternative	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
2A Onshore Priority	+/-	-	-	-	+/-	+	+	+	-	-	+	This option would be heavily reliant on further developing onshore wind and solar farms throughout the county and therefore would have negative impacts largely associated with the capacity of the landscape and landuse to accommodate the change. Indirect impacts to water and BFF would also be likely through increased pressure on ecological corridors, water quality, spread of invasives etc. Whilst positive impacts to CF would occur, they may not be realised to their full potential with reliance on onshore technologies. Certain technologies may also result in negative impacts to air quality through increased traffic during operation or construction for example. Positive impacts to PHH would occur through employment, security of supply but again negative impacts during the construction phase would be likely.
2B Marine (Offshore) Priority	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	The development of offshore only would in the first instance place greater pressure on the marine environment on BFF, Water, seabed and seascapes, in contrast it would relieve existing pressure on BFF, LandS and aquatic watercourses by diverting RE infrastructure away from the terrestrial environment. There is a risk that by preceding with offshore only the RES would not meet the national targets as some of the technologies are still in testing phase and the planning process to facilitate offshore and the construction of the RE infrastructure may not be achieved by the targets dates of 2030.
2C Combination of Onshore plus Planning for Offshore	+/-	+/-	+/-	+/-	+/-	+	+	+	+/-	+/-	+	This alternative focuses on a number of possible technologies to meet renewable energy targets including both onshore and offshore. It is not reliant on the offshore infrastructure to be in place to meet the targets but rather for the associated infrastructure (port, grid, roads) to be planned for so when the time comes to provide i.e. the

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Alternative	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
												<p>offshore development Clare County Council are in a position to move forward.</p> <p>This option is therefore considered favourable in terms of progressing the onshore RE but also for planning and setting County Clare up to be ready for facilitating offshore development.</p> <p>Whilst this alternative is favourable in relation to the provision of renewable energy technologies within County Clare as with the other alternatives there are uncertainties in the potential impacts that each type of technology could have on the environment. In relation to MA there are overarching positive impacts from the generation of employment, protection of agricultural land through the number of renewable technologies proposed and the protection of infrastructure as again there are a number of options within this alternative. It is also positive as it will in the long term reduce the reliance on shore wind and associated impacts on landuse, BFF and landscape capacity. Negative impacts however may arise from construction works associated with the RE infrastructure including any dredging of ports that maybe required, provision of substations, grid connections etc.</p>

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8.4 Modal

These alternatives examine the scope and combination of different RE technology types for meeting the RE vision of the Clare CDP and the objectives of the draft RES.

8.4.1 Alternative 3A – Mixed Used Technology as per the Existing RES

This alternative identifies a combination of familiar technologies identified in the first RES to support the renewable energy needs for County Clare under the three main target renewable energy source headings of Electricity (RES-E), Heat (RES-H) and Transport (RES-T).

For example, under RES-E, the targets could be achieved from a combination of solar, wind, hydropower etc. Under Alternative 3A, the draft RES 2022-2030 would continue to utilise the preferred modal approach from the previous RES, which took forward combined technologies as well as efficiency in demand.

8.4.2 Alternative 3B – Expanded Modal Scope

This alternative revises the mix of potential technologies that can deliver the RES targets, including new approaches to energy storage and conversion. The modal scope from the existing RES was expanded to consider new technologies such as utility scale solar, energy storage technologies, energy conversion via hydrogen etc.

8.4.3 Assessment of Options

Table 8.4.1: Assessment of Modal Alternatives

Alternative	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
3A Mixed use technology as per the existing RES	+	0/-	0/-	0/-	+/-	+	+	+/-	0/-	0/-	+/-	<p>This alternative scenario would continue with energy efficiency measures and conservation which would continue to be included along with a number of different technology options.</p> <p>This scenario provides a reasonable spread of RE options for County Clare and it also ensures that there is flexibility should certain options not be feasible in relation to impacts on the environment. Therefore there are positive impacts on many of the SEOs, particularly MA, CF/CCM/CCA and PHH.</p> <p>However it is acknowledged that there will be some negative environmental impacts on some environmental objectives due to the development of RE in general, and particularly where this occurs on greenfield compared to existing built-up or industrial areas. There are some long-term negative aspects for MA and CCA in the sense that this option fails to consider newer RE technologies.</p>
3B Expanded Modal Scope	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+	<p>Option 3B is similar to Option 3A in that it considers a range of modal options for delivering on RE targets. The LARES (2013) sieve analysis methodology was again applied during the preparation of the draft RES 2022-2030, taking stock of the maximum RE resource possible, filtering down to modes that are technically possible, and finally those that are accessible and planned, which takes a balanced view of other competing interests (such as environmental constraints).</p> <p>Further, the draft RES has had regard to the <i>Clare Energy & Emissions Balance for 2010</i>, published by the Limerick Clare Energy Agency in 2012. This was subsequently updated by the RES plan team in 2021 following the same methodology but in</p>

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Alternative	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
												<p>addition, updating it with Clare's energy needs to 2020, and predicting to 2030. This takes account of Ireland's National Energy & Climate Plan (NECP) and that plan's <i>with additional measures</i> (WAM) scenario. This analysis has helped in the consideration of the best modal options for Clare going forward based on the latest information. In this regard, technologies such as energy storage solutions, utility-scale solar and energy conversion have been considered and included in the draft RES, expanding on the scope of the current RES.</p> <p>As for Option 3A, there are neutral to negative direct and indirect impacts on environmental objectives, as RE development can impact on BFF, W, LS, LandS and CH in the short, medium and long term depending on the technology type. AQ is mixed as reduced fossil fuels can be expected to lead to air quality improvements however fuels such as biomass are still carbon-based and undergo combustion. RE development overall has direct positive long term impacts on MA, CF, CCA and CCM.</p>

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8.5 Sectoral and/or Temporal Prioritisation

A number of aspects were also considered in relation to how the RE infrastructure would be delivered. One such measure was the consideration of utility scale sector only which would rely on RE infrastructure being generated from large commercial scale installations (e.g. wind, solar, biomass) supplying the electricity grid from commercial or industrial organisations. Another aspect considered was focusing on communities and households which could include e.g. community owner solar, wind projects and from the Household sector could include microgeneration of renewable energy in households, with some feed-in of excess energy to the grid. Whilst both options would contribute to meeting RE targets, acting individually utility scale development would not serve to meet the community needs of Clare and if community/household based sector was only brought forward it is likely that the stringent targets set for 2030 would not be met. It was concluded that a combination of both would best serve the needs of the communities in Clare whilst also meeting Clare's commitments to meeting RE targets for 2030.

8.6 Overall Preferred Strategy and Reasons for Choosing

Option 1A is not considered preferable as without significant drive in relation to plans and policies there is the possibility that renewable energy targets may not be met and that reduction in GHGs would not be extensive in meeting targets.

There is very little difference in terms of the potential impacts associated with alternative 1B and 1C in that both aim to meet the national renewable energy targets with option 1C being slightly more ambitious. Given that County Clare is currently meeting the Renewable energy Targets for electricity it is considered that **Option 1C is preferred** subject to strict planning controls as set out the CDP and the RES.

Option 2C is considered the most preferable alternative under Temporal/prioritisation as it does not rely heavily on either onshore or offshore but rather a combination of both. It also aims to move County Clare in the direction of setting itself up in the future to explore opportunities for offshore wind or tidal.

Option 3B is the preferred alternative under the Modal alternatives. While Option 3A and the current RES contain a good diversity of modal options, it does not take account of newer technologies which have become feasible in the interim period since it was published. The draft RES 2022-2023 also considers the latest information and updated energy balance for Clare, as well as having regard to national measures such as the NECP. By expanding the scope of modal options, there will be better diversity of choice and support, better balance and resiliency to changes, as well as security of energy supply.

The overall preferred option is therefore a combination of **1C, 2C and 3B** with a combination of community/household and utility-scale RE development.

9 ASSESSMENT OF PREFERRED SCENARIO

The aim of the SEA is to identify potential effects on the environment and the likely significance of those effects. The SEA does not involve an assessment of actual effects, which is the role of the EIA process, as, due to strategic nature of the plan, and the scale of the overall study area and available resource, it is not possible to determine at this stage where certain individual developments are likely to occur.

9.1 Environmental Appraisal of the Technologies

A number of evaluation steps were undertaken in relation to the different technologies and feedstocks to gain a better understanding of the potential effects on the SEOs, as shown in **Table 9.1.1**. The potential for significant environmental effects associated with each renewable energy technology is outlined in **Table 9.1.2**. Each of the renewable technologies are grouped into appropriate categories and assessed in relation to short, medium, long term and cumulative impacts. The supporting infrastructure (i.e. connection to grid infrastructure, distribution networks, accessibility (by road, rail, or sea), ports / yards for crane installation and component assembly and access routes for decommissioning, operation and maintenance) also form part of this assessment. **Table 9.1.3** provides an overview of the key issues for each SEO in relation to the technologies contained within the Draft RES in order to establish the key potential impacts between the SEOs and the renewable energy technologies.

Table 9.1.1: Summary of Renewable Energy Technologies and Feedstocks

Renewable Energy Type	Technologies and Applications	Feedstock Considered
Bioenergy	Combustion (heat only) Combined Heat and Power (CHP) Anaerobic Digestion District Heating and Cooling	Short rotation coppice & Energy Crops Straw Wood industrial residue Forest residues Municipal waste/ Landfill gas Sewage sludge waste & Agricultural waste
Geothermal Energy	Shallow Geothermal (ground loop) Ground Source Heat Pumps Water Source Heat Pumps	Thermal Energy from earth's crust
Solar Energy	Thermal Solar Energy/ Photovoltaic Energy	Solar Energy
Marine Renewables	Offshore Wind/ Wave Energy Tidal Barrage & Tidal Steam flow turbines	Wind Energy Ocean Energy
Micro Hydroelectric	Small Scale Hydroelectric(i.e. 10MW to 1MW output)	Hydro Energy
Pumped Hydro	Mechanical Energy Storage (creation of reservoirs)	Hydro Energy
Micro Generation	Solar photovoltaic panels (PV) Solar hot water panels Small free standing wind turbines Micro scale CHP plants Hydroelectric schemes Micro scale biomass heating & wood burning stoves Ground source heat pumps Air source heat pumps	As per larger scale installations
Grid Connection	Underground/overground transmission lines Substations	

Table 9.1.2: Environmental Effects of the Technologies

Renewable Energy Technology	Short Term (Positive/ Negative/ Permanent/ Temporary)	Medium Term (Positive/ Negative/ Permanent/ Temporary)	Long Term (Positive/ Negative/ Permanent/ Temporary)	Cumulative and Synergistic
Bioenergy	<ul style="list-style-type: none"> Short term environmental effects for bioenergy facilities will be evident due to construction traffic and the risk to population in relation to disturbance. Other key environmental considerations will only be influential depending on the siting of the bioenergy facility and its interactions with the surrounding landscape e.g. proximity to feedstock and energy demand. 	<ul style="list-style-type: none"> Can pose risk to native species through the introduction of non-native bioenergy crops. Can pose risk to biodiversity, flora and fauna if forestry resources are not harvested sustainably. During operation, depending on facility size and type, there may be larger traffic volumes than normal; potential noise and air pollution and risk to population. Visual impact of larger centralised facilities may be an issue. Odour may be an issue depending on the nature of processing at the facility. Risk of watercourse eutrophication due to the spreading of farm wastes can be lessened through use as feedstocks for anaerobic digestion. Contamination of ground water and seepage from stored effluents may be an issue. Light and noise pollution (from potential 24/7 facility operation) may be an issue for biodiversity, flora and fauna. 	<ul style="list-style-type: none"> It is not envisaged that there will be any long term ill-effects from bioenergy, should resources be sourced, and as necessary, planted through sustainable environmental practices. Policy for the displacement of agricultural food crops for energy crop growth is inconclusive; the long term impacts of such may need to be considered. 	<ul style="list-style-type: none"> The cumulative impact of 24/7 operations with potential for noise and light pollution combined with increased traffic due to feedstock deliveries may cause nuances to human beings. However this will be entirely dependent on the siting of the facility e.g. in a clustered urban setting or stand-alone rural setting. The introduction of new bioenergy crop species and the harvesting of forestry biomass may have a cumulative impact on biodiversity flora and fauna in the surrounding area. Risk to nearby water sources may be lessened due to the reduction in farm waste spreading. Benefits from the use of wastes as a closed loop resource to generate heat and electricity.

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Renewable Energy Technology	Short Term (Positive/ Negative/ Permanent/ Temporary)	Medium Term (Positive/ Negative/ Permanent/ Temporary)	Long Term (Positive/ Negative/ Permanent/ Temporary)	Cumulative and Synergistic
Geothermal Energy	<ul style="list-style-type: none"> Geothermal and Ground Source Heat Pumps (GSHP) have significantly different considerations and environmental effects than deep geothermal energy. The Clare RES only looks at shallow GSHP. The short term environmental effects are expected to be minimal; with only minor considerations to do with siting and during the construction phase. The impact on biodiversity, flora and fauna and population is minimal as structures are mainly below ground. Main considerations are in relation to soils and geology and direct impact on this resource. Impacts on water quality for open loop systems installation. Minor siting consideration towards cultural heritage and protection of areas of archaeological potential. 	<ul style="list-style-type: none"> Shallow geothermal is expected to have minimal impact during the operational phase Potential for impact to water and biodiversity flora and fauna due to changes in ground temperature although this is expected to be minimal. Impact on water flow regimes for open loop system water source heat pump installations. 	<ul style="list-style-type: none"> Long term impacts are also expected to be minimal with only minor environmental effects being possible on soils and geology. 	<ul style="list-style-type: none"> Significant environmental effects are not envisaged for shallow geothermal and ground source heat pumps. Any short or medium terms risks are likely to be mitigated at design stage.
Solar Energy	<ul style="list-style-type: none"> Solar energy is expected to have only minor environmental effects in the short term. Risk to cultural heritage for installation on protected structures. Potential effects to biodiversity, flora and fauna through interactions with bat roosts for building works. 	<ul style="list-style-type: none"> Minimal risks to environment in medium term. Special consideration may need to be given to protected structures and those in architectural conservations areas. 	<ul style="list-style-type: none"> Potential risk to cultural heritage through removal from structures of historical importance. 	<ul style="list-style-type: none"> Significant environmental effects are not envisaged for solar energy. Any short or medium terms risks to cultural heritage are likely to be mitigated at design stage.
Off-shore Wind	<ul style="list-style-type: none"> Biodiversity, flora and fauna could be affected by disturbances to the sea bed during construction. Noise, in particular due to piling during installation, may affect marine wildlife. 	<ul style="list-style-type: none"> May have visual impact on seascape, in particular on protected views. Effects on biodiversity, flora and fauna in the medium term can be positive and negative i.e. may 	<ul style="list-style-type: none"> Potential effects on dynamic marine forces i.e. coastal erosion, flooding, wave and tidal patterns. 	<ul style="list-style-type: none"> Short term environmental impacts from the installation of wind turbines and the potential medium term impacts on marine habitats, changes in tidal flow and wave regime and

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Renewable Energy Technology	Short Term (Positive/ Negative/ Permanent/ Temporary)	Medium Term (Positive/ Negative/ Permanent/ Temporary)	Long Term (Positive/ Negative/ Permanent/Temporary)	Cumulative and Synergistic
	<ul style="list-style-type: none"> • Risk to population through transportation of component parts during construction. • Potential risk to marine water quality during construction due to machinery and sea bed disturbances • Potential disturbance to shipwrecks and thus cultural heritage. 	<ul style="list-style-type: none"> • interrupt habitats and migration patterns for certain species may experience ill-effects but other species may benefit through a new sheltered habitat. • May have impact on material assets; shipping and navigation. • Potential conflict with flight paths to and from Shannon airport. 	<ul style="list-style-type: none"> • Risk to population through transport of infrastructure during decommissioning. 	<ul style="list-style-type: none"> • migration patterns may have a cumulative effect on offshore biodiversity, flora and fauna. These effects may be investigated further at project planning stage. • Conversely the installation of offshore turbines has potential to create a protected habitat for certain marine species.
Wave and Tidal Energy	<ul style="list-style-type: none"> • Disturbances to the sea bed due to pilling/ dredging and blasting during construction may have ill-effects on marine biodiversity, flora and fauna. • Noise during installation can affect marine wildlife. • Infrastructure can be quite large, may affect population for the transportation of such. 	<ul style="list-style-type: none"> • Visual impact of wave and tidal devices on the seascape will not be as evident as other offshore technologies. • May pose risk to marine wildlife from the use of underwater turbines and moving parts may need to be considered. • Tidal devices located in estuaries may also have effects on freshwater wildlife. • May pose risk to the interruption of migration patterns and habitats. • May have impact on material assets; shipping and navigation. 	<ul style="list-style-type: none"> • Potential effects on dynamic marine forces i.e. coastal erosion, flooding, wave and tidal patterns. • Risk to population through transport of infrastructure during decommissioning. 	<ul style="list-style-type: none"> • Short term environmental impacts from the installation of wave and tidal energy devices and the potential medium term impacts on marine habitats, migration patterns, risk of underwater moving parts and changes in tidal flow and wave regime may have a cumulative effect on offshore biodiversity, flora and fauna. These effects may be investigated further at project planning stage.
Micro Hydroelectric Power	<ul style="list-style-type: none"> • Risk to freshwater ecology due to watercourse pollution and sediment disruption during installation. • Risk of impending fish passage. 	<ul style="list-style-type: none"> • Potential risk to fish stocks, migration patterns and angling • May cause effect on downstream flow regimes, flooding and water temperatures. • Potential for increased noise levels at intake. 	<ul style="list-style-type: none"> • Risk to freshwater ecology due to watercourse pollution and sediment disruption during decommissioning. 	<ul style="list-style-type: none"> • Cumulative effects of fish passage could have implications on fish stocks in other river sections.

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Renewable Energy Technology	Short Term (Positive/ Negative/ Permanent/ Temporary)	Medium Term (Positive/ Negative/ Permanent/ Temporary)	Long Term (Positive/ Negative/ Permanent/ Temporary)	Cumulative and Synergistic
Pumped Hydro	<ul style="list-style-type: none"> • Risk to freshwater ecology due to watercourse pollution and sediment disruption during construction. • Impacts of increased traffic and proposed access routes during construction often in highland areas. • Risk to soils and geology and the preservation of agricultural land if not sited correctly. • May pose risk to landscape and visual impact if not integrated well into surrounding environment. • High carbon content of cement may pose a risk to climate and air during construction but this will most likely be assessed at design stage. 	<ul style="list-style-type: none"> • Can create benefits to population through the provision of recreational facilities. • May impact population through the loss of land. • May impact biodiversity, flora and fauna through loss of habitat and potential habitat fragmentation. • May cause effects to downstream flow regimes, flooding and water temperatures. • Impact on fish stocks, migration patterns and angling. • Potential for increased noise levels at intake. 	<ul style="list-style-type: none"> • May have medium and long term impacts on flooding regimes. • Impacts of increased traffic and proposed access routes during decommissioning. 	<ul style="list-style-type: none"> • Impacts of reservoir land take, loss of habitat and potential habitat separation may have cumulative effects on certain species. • Cumulative effects of short, medium and long term effects on downstream flow regimes and flooding risk may have knock on effects on population further downstream.
Grid/Transmission Connection	<ul style="list-style-type: none"> • Impacts to terrestrial and seabed habitats and species: physical loss/ destruction, changes to sedimentation/ hydrography/ turbidity, scour effects, pollution of sediment, colonisation of hard substrate, disturbance/ remobilisation of contaminated material • Risk to cultural heritage for installation on protected structures or encountering unknown finds • Risk of spread of invasive species • Impacts to landscape if infrastructure is above ground • Noise during the construction phase • Traffic impacts during the construction phase 	<ul style="list-style-type: none"> • Minimal impacts to landscape if underground • May impact biodiversity, flora and fauna through loss of terrestrial and seabed habitat 	<ul style="list-style-type: none"> • Potential impacts associated with maintenance or decommissioning 	<ul style="list-style-type: none"> • Short term environmental impacts from the installation of grid infrastructure and the potential medium term impacts on marine habitats. These effects may be investigated further at project planning stage. •

Table 9.1.3: Environmental Effects of the Technologies on SEA Topics

Renewable Energy Technology	Biodiversity, Flora & Fauna	Population/ Human Health	Water	Soils/ Geology	Climate/ Air	Cultural Heritage	Landscape/ Seascape	Material Assets
Bioenergy	<ul style="list-style-type: none"> • Risk to native species • Risk if forestry not harvested sustainably • Light and noise pollution from operation 	<ul style="list-style-type: none"> • Larger traffic volumes 	<ul style="list-style-type: none"> • Lessened eutrophication risk • Seepage of stored effluents 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Light and noise pollution from operations • Odour issues with certain processes 	<ul style="list-style-type: none"> • Unlikely to have significant impact (always potential for discovery of unknown archaeology) 	<ul style="list-style-type: none"> • Site specific but unlikely to be significant 	<ul style="list-style-type: none"> • Potential displacement of agricultural land
Geothermal Energy	<ul style="list-style-type: none"> • Minimal as structures are mainly below ground • Removal of above ground land 	<ul style="list-style-type: none"> • - Unlikely to have significant impact 	<ul style="list-style-type: none"> • Potential impact from open loop systems • Impact on flow regimes 	<ul style="list-style-type: none"> • Potential impact on ground temperatures 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Site specific but unlikely to be significant (always potential for discovery of unknown archaeology) 	<ul style="list-style-type: none"> • Site specific but unlikely to be significant 	<ul style="list-style-type: none"> • Unlikely to have significant impact
Solar Energy	<ul style="list-style-type: none"> • Site specific potential impact on bats or roosting birds 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Placement of solar panels on protected structures 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Unlikely to have significant impact
Off-shore Wind	<ul style="list-style-type: none"> • Noise during construction • Habitat fragmentation • Sea bed disturbance • Potential for bird collision 	<ul style="list-style-type: none"> • Transportation of key parts during construction 	<ul style="list-style-type: none"> • Potential for pollution and sea bed disturbance • Impact on wave and tidal patterns • Impact on flooding 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Unlikely to have significant impact 	<ul style="list-style-type: none"> • Potential for impacting on sub-sea level cultural heritage, ship wrecks 	<ul style="list-style-type: none"> • Site specific but potential to interact with the seascape character 	<ul style="list-style-type: none"> • Impact on shipping and navigation • Potential for conflict with Shannon Airport flight paths • Risk to protection of road network

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Renewable Energy Technology	Biodiversity, Flora & Fauna	Population/ Human Health	Water	Soils/ Geology	Climate/ Air	Cultural Heritage	Landscape/ Seascape	Material Assets
Wave and Tidal Energy	<ul style="list-style-type: none"> Habitat disturbance Sea bed disturbance Noise during construction Migration pattern disturbance 	<ul style="list-style-type: none"> Transportation of components during construction 	<ul style="list-style-type: none"> Impact on wave and tidal patterns Impact on flooding 	<ul style="list-style-type: none"> Unlikely to have significant impact 	<ul style="list-style-type: none"> Unlikely to have significant impact 	<ul style="list-style-type: none"> Potential for impacting on sub-sea level cultural heritage 	<ul style="list-style-type: none"> Site specific but unlikely to be significant 	<ul style="list-style-type: none"> Impact on shipping and navigation Risk to protection of road network
Micro Hydroelectric Power	<ul style="list-style-type: none"> Watercourse pollution Sediment disturbance Risk to fish migration patterns Disturbance to hydrological regime Slight risk of increased noise levels at intake 	<ul style="list-style-type: none"> Risk to drinking water quality 	<ul style="list-style-type: none"> Impact on downstream flow regimes Impact on flooding patterns 	<ul style="list-style-type: none"> Unlikely to have significant impact 	<ul style="list-style-type: none"> Unlikely to have significant impact 	<ul style="list-style-type: none"> Unlikely to have significant impact (always potential for discovery of unknown archaeology) 	<ul style="list-style-type: none"> Site specific but unlikely to be significant 	<ul style="list-style-type: none"> Unlikely to have significant impact
Pumped Hydro	<ul style="list-style-type: none"> Loss of habitat and Habitat fragmentation Disturbance to hydrological regime 	<ul style="list-style-type: none"> Provision of recreational facility Increased traffic during construction Risk to drinking water quality Increased noise levels at intake 	<ul style="list-style-type: none"> Impact on downstream flow regimes Impact on flooding patterns 	<ul style="list-style-type: none"> Risk to agricultural land preservation 	<ul style="list-style-type: none"> Unlikely to have significant impact 	<ul style="list-style-type: none"> Site dependent risk to cultural heritage 	<ul style="list-style-type: none"> Land take can have impact of visual aspect 	<ul style="list-style-type: none"> Risk to protection of road network

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) ENVIRONMENTAL REPORT (ER)

Renewable Energy Technology	Biodiversity, Flora & Fauna	Population/ Human Health	Water	Soils/ Geology	Climate/ Air	Cultural Heritage	Landscape/ Seascape	Material Assets
Grid Connection	<ul style="list-style-type: none"> Impacts to terrestrial and seabed habitats and species: Physical loss/ destruction, 	<ul style="list-style-type: none"> Traffic impacts during the construction stage 	<ul style="list-style-type: none"> Changes to sedimentation/ hydrography/ turbidity, scour effects, pollution of sediment, colonisation of hard substrate, disturbance/ remobilisation of contaminated material 	<ul style="list-style-type: none"> Remobilisation of contaminated material 	<ul style="list-style-type: none"> Unlikely to have significant impact 	<ul style="list-style-type: none"> Impact on unknown archaeology 	<ul style="list-style-type: none"> Site specific but unlikely to be significant. Impact will depend on whether infrastructure is above or below ground 	<ul style="list-style-type: none"> Unlikely to have significant impact

9.2 Impact Assessment Methodology

The approach used for assessing the policies / objectives for the Draft RES is an objective led approach using assessment matrices, shown in **Table 7.1.1** in line with current best practise for SEA. The assessment matrix tests whether the proposed changes will have likely significant impacts (positive and negative, direct and indirect, cumulative and synergistic) for the defined Strategic Environmental Objectives (SEOs) (see **Chapter 7**) with reference back to the detailed assessment criteria outlined in **Chapter 7**.

The assessment matrices contain a comparison of each of the Draft RES policies/ objectives against each of the Strategic Environmental Objectives with an assessment rating assigned for the purposes of comparison. In this case, plus (+) indicates a potential positive impact, minus (-) indicates a potential negative impact, plus/minus (+/-) indicates that both positive and negative impacts are likely or that in the absence of further detail the impact is unclear, and a neutral or no impact is indicated by a zero (0). Combinations of these symbols are also possible, e.g.0/-, which indicates that impact may be neutral or negative depending on how the policy or objective is delivered.

Where negative impacts have been identified mitigation measures have been devised where possible through inclusion of either new policies/ objectives, or recommendations have been made to amend or include additional text within the policies/ objectives. Comments with respect to the recommended mitigation measures identified as a result of this assessment are noted within the comments section of the matrices and the associated mitigation measures and/ or proposed changes/amendments to objectives are denoted in **green** (new text to be added) or **strikethrough** (text to be removed) within the objective column section. The Natura Impact Report mitigation has been included in **red**. The SEA/AA teams have provided iterative feedback to the RES team over the course of the development of the draft RES; where mitigation has been incorporated into the draft RES, this has been noted in the proposed mitigation sections in **highlight**.

A summary of all mitigation measures proposed as a result of this assessment are documented in **Section 10.1** of this environmental report.

9.2.1 Chapter 1 – Introduction

Reference	Objectives
RES 1.1 Proposed SEA and NIR Mitigation Measures (apply to all renewable energy development)	<ul style="list-style-type: none"> A. Any proposals for Renewable energy infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029. B. The EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool should be applied to inform decision-making in terms of infrastructural/siting considerations as well as consideration of environmental sensitivities. C. To ensure that renewable energy development proposals support and enhance the connectivity and integrity of habitats in the Renewable Energy Strategy (RES) area by incorporating natural features into the design of development proposals; and to work with infrastructure providers to co-develop infrastructural management plans to enhance biodiversity. D. To require any Renewable Energy project to be in compliance with the objectives and requirements of the Habitats Directive, specifically Article 6(3) and where necessary 6(4), Birds, Water Framework (including the implementation of the 3rd Cycle RBMP), and all other relevant EU Directives and all relevant transposing national legislation. E. To require project planning for any Renewable Energy project to be fully informed by ecological and environmental constraints at the earliest stage of project development and any necessary assessment to be undertaken, including assessments of disturbance to species and habitats, as required. Any ecological assessment shall also be required to consider ecological connectivity and potential supporting habitats to European Sites. F. To require the preparation and assessment of all planning applications for Renewable Energy projects to have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report, SEA Environmental Report and Strategic Flood Risk Assessment Report of the County Clare CDP 2021- 2028 Development Plan and SEA of the Renewable Energy Strategy. G. Ensure that no renewable energy projects are permitted that give rise to significant cumulative, direct, indirect or secondary impacts on the integrity of European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation,

Reference	Objectives
	decommissioning or from any other effects, (either individually or in combination with other plans, programmes, etc. or projects) (Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be: a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place).

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 1.1 A-G	+	+	+	+	+	+	+	+	+	+	+

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AC* – Air Quality, *CF* Climatic Factors; *CCM* – Climate Change Mitigation, *CCA* Climate Change Adaptation, *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

Discussion

The general mitigation measure proposed by the SEA assessment following the assessment of Chapter 3 of the draft RES have been incorporated into the draft RES as **RES 1.1 A-D**. The three mitigation measures proposed by the NIR have been incorporated into the draft RES as **RES 1.1 E-G**.

Proposed SEA Mitigation Measures:

See mitigation proposed under Chapter 3 (**Section 9.2.3**) below following the assessment of the Chapter 3 objective.

9.2.2 Chapter 2 – Legislation and Policy Context

No objectives included.

9.2.3 Chapter 3 – Energy Profile of County Clare

Reference	Objectives
RES 3.1 Meeting the County's energy needs from 100% renewables	To meet the County's energy needs from 100% indigenous renewable energy sources.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 3.1	+	+/-	+/-	0/-	+/-	+	+	+	0/-	0/0	+

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AC* – Air Quality, *CF* Climatic Factors; *CCM* – Climate Change Mitigation, *CCA* Climate Change Adaptation, *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

Discussion

Use of indigenous renewable energy sources would result in positive impacts to PHH, AQ, CCM, CCA and MA as such sources would result in cleaner emissions and require less importation and reliance on non-renewable sources. The increase in renewable energy in County Clare may increase local employment opportunities, reduce greenhouse gas emissions (GHG) and improve energy efficiency. Negative impacts to AQ could also occur during the construction phase from increased noise and dust.

Whilst BFF would benefit from cleaner air quality there would be some potential negative impacts associated with the RE infrastructure required to deliver the target i.e. turbines and associated construction impacts or operational if sited inappropriately.

All of these technologies could have potential neutral to negative impacts on W/ LS/ CH/LandS as a result of construction or inappropriate siting of RE infrastructure to achieve the targets. General mitigation measures are required and should be applicable to all RE developments to ensure environmental protection.

Proposed SEA Mitigation Measures:

[Note – SEA mitigation is outlined in green, NIR mitigation in red]

General Mitigation – Proposed New Objectives to be included in Chapter 1

Discussion

- Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.
Mitigation has been incorporated into the Chapter as Objective RES 1.1 A
- The EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool should be applied to inform decision-making in terms of infrastructural/siting considerations as well as consideration of environmental sensitivities.
Mitigation has been incorporated into the Chapter as Objective RES 1.1 B
- To ensure that RE development proposals support and enhance the connectivity and integrity of habitats in the RES area by incorporating natural features into the design of development proposals; and to work with infrastructure providers to co-develop infrastructural management plans to enhance biodiversity.
Mitigation has been incorporated into the Chapter as Objective RES 1.1 C

Proposed NIR Mitigation

- To require any Renewable Energy project to be in compliance with the objectives and requirements of the Habitats Directive, specifically Article 6(3) and where necessary 6(4), Birds, Water Framework (including the implementation of the 3rd Cycle RBMP), and all other relevant EU Directives and all relevant transposing national legislation.
Mitigation has been incorporated into the Chapter as Objective RES 1.1 D
- To require project planning for any Renewable Energy project to be fully informed by ecological and environmental constraints at the earliest stage of project development and any necessary assessment to be undertaken, including assessments of disturbance to species and habitats, as required. Any ecological assessment shall also be required to consider ecological connectivity and potential supporting habitats to European Sites.
Mitigation has been incorporated into the Chapter as Objective RES 1.1 E
- To require the preparation and assessment of all planning applications for Renewable Energy projects to have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report, SEA Environmental Report and Strategic Flood Risk Assessment Report of the County Clare CDP 2021- 2028 Development Plan and SEA of the Renewable Energy Strategy.
Mitigation has been incorporated into the Chapter as Objective RES 1.1 F
- Ensure that no RE projects are permitted that give rise to significant cumulative, direct, indirect or secondary impacts on the integrity of European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects, (either individually or in combination with other plans, programmes, etc. or projects) (Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be: a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place).
Mitigation has been incorporated into the Chapter as Objective RES 1.1 G

9.2.4 Chapter 4 – Summary of Renewable Potential, Resources and Targets

Reference	Objectives
RES 4.1 Meeting the County's energy needs from 100% renewables	To facilitate the achievement of (or to exceed where possible) the renewable energy targets set out in Table 4.3 by 2030, ensuring that County Clare is the national leader in sustainable renewable energy generation, supporting energy efficiency, security and conservation, achieving balanced social, environmental and economic development throughout the County and assisting in the achievement of Ireland's national climate change mitigation targets.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 4.1	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	0/-/+

Key: PHH – Population and Human Health; BFF – Biodiversity, Flora and Fauna; LS – Soils and Geology; W – Water; AQ – Air Quality, CF Climatic Factors; CCM – Climate Change Mitigation, CCA Climate Change Adaptation, MA – Material Assets; CH – Cultural Heritage; LandS – Landscape.

Discussion

This objective is very positive in relation to PHH, CF, CCM and CCA and MA for renewable energy. The increase in renewable energy in County Clare may increase local employment opportunities, reduce greenhouse gas emissions (GHG) and improve energy efficiency. Negative impacts to AQ could also occur during the construction phase from increased noise and dust.

Table 3.2 of the Draft RES outlines the types of renewable technologies that could provide the energy to achieve the 2030 targets. However, all of these technologies could have potential neutral to negative impacts on BFF/ W/ LS/ CH/LandS as a result of construction or inappropriate siting of RE infrastructure to achieve the targets. Short term negative impacts may also be experienced by residents in local communities due to increased traffic and/or noise during the construction stage.

Proposed SEA Mitigation Measures:

General Mitigation

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

9.2.5 Chapter 5 – Energy Conservation and Efficiency

Reference	Objectives
RES 5.1 Energy Efficiency and Conservation	A. To contribute towards the EU wide target of achieving at least 32.5 % improvement in energy efficiency.
	B. To achieve a 50% energy efficiency target for public sector bodies by 2030.
	C. To support the implementation of national energy efficiency standards and to support and facilitate energy conservation and efficiency, including through: <ul style="list-style-type: none"> a. Improved building design; b. Promoting smarter travel; and c. Raising awareness / benefits of energy conservation
	D. Encourage consideration of energy efficiency and low-carbon design solutions when carrying out pre-planning discussions for major residential, commercial, and industrial development.
	E. To require all planning applications for new buildings to demonstrate how they have incorporated measures for sustainable energy efficiency, in respect of siting, design, building fabric and services, (i.e. heating and ventilation), as a means of reducing future reliance on traditional fuel sources.
	F. To encourage a high standard of sustainable energy efficiency and conservation in the existing building stock by encouraging developers, owners, and occupiers to improve the environmental performance of buildings and to promote the uptake in incentives, schemes, grants or other available funding to improve energy efficiency.
	G. To reduce the County's dependence on imported fossil fuels and to develop a low carbon economy by: <ul style="list-style-type: none"> a. Promoting innovative new building design which demonstrate a high level of energy conservation, energy efficiency and use of renewable energy sources. b. Promoting retrofitting of existing buildings to achieve a high level of energy conservation, energy efficiency and use of renewable energy sources. c. Promoting the development and use of alternative energy vehicles in line with the concept of smarter travel and encourage and facilitate the development of ancillary infrastructure. d. To increase awareness of the environmental, financial, social and practical benefits of being energy efficient. e. To support and facilitate the development of sustainable energy communities. f. To promote the further development of sustainable energy practices in industry and commerce, including the use of clean technologies. g. To promote and facilitate research and development in energy efficiency and conservation best practice. h. To identify significant 'waste' energy sources in County Clare and to promote and facilitate the capture and conversion of such energy to a usable resource for local consumption.

Reference	Objectives
	i. To promote the use of efficient energy storage systems and infrastructure that supports energy efficiency and renewable energy system optimisation
	j. Support energy efficiency and conservation education in partnership with local, regional, and national organisations.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 5.1 A	+	0	0	0	+	+	+	+	0/-	0	+/-0
RES 5.1 B	+	0	0	0	+	+	+	+	0/-	0	+/-0
RES 5.1 C	+	0	0	0	+	+	+	+	0/-	0	+/-0
RES 5.1 D	+	0	0	0	+	+	+	+	0/-	0	+/-0
RES 5.1 E	+	0	0	0	+	+	+	+	0/-	0	+/-0
RES 5.1 F	+	0	0	0	+	+	+	+	0/-	0	+/-0
RES 5.1 G(a)	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 5.1 G(b)	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 5.1 G(c)	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 5.1 G(d)	+	0	0	0	+	+	+	+	0	0	+
RES 5.1 G(e)	+	0	0	0	+	+	+	+	0	0	+
RES 5.1 G(f)	+	0	0	0	+	+	+	+	0	0	+
RES 5.1 G(g)	+	0/+	0/+	0/+	+	+	+	+	0/+	0/+	+/-0
RES 5.1 G(h)	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+/-0
RES 5.1 G(i)	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 5.1 G(j)	+	0/+	0/+	0/+	+	+	+	+	0/+	0/+	+/-0

Key: PHH – Population and Human Health; BFF – Biodiversity, Flora and Fauna; LS – Soils and Geology; W – Water; AQ – Air Quality; CF – Climatic Factors; CCM – Climate Change Mitigation, CCA – Climate Change Adaptation, MA – Material Assets; CH – Cultural Heritage; LandS – Landscape.

Discussion

RES 5.1 A This objective is very positive in relation to PHH, AQ, CF, CMM, CMA and MA. The increase in energy c in County Clare may increase local employment opportunities, reduce green-house emissions (GHG), improve air quality and increase use of renewable energy sources.

RES 5.1 B places onus on the Public Sector to contribute to meeting our energy efficiency targets and is therefore very positive in relation to PHH, CF, CMM, CMA and MA (for renewables) as it is focusing the public to consider how they will achieve energy efficiency within new developments and is generally promoting energy efficiency across the public sector for all modes of energy include building design, sustainable transport etc.

RES 5.1 C, D and E are similar are the objectives are very positive in relation to PHH, CF, CMM, CMA and MA (for renewables) as they are focusing developers to outline how they will provide energy efficiency within new developments and are generally promoting energy efficiency awareness. There are neutral impacts on BFF, W, S, CH, MA as the focus is on the internal building efficiency. There is potential with solar panels to have impacts on LandS.

RES 5.1 F This objective is very positive but is solely reliant on the developers own initiative to retrofit existing buildings with energy efficiency measures. The impacts in relation to the SEOs are identical to **RES 5.1E**.

RES 5.1 G(a)-(c) are positive to PHH, AQ/CF/ CCM, CCA and MA but may have negative impacts to AQ/BFF, W, SL, CH and LandS during construction or operation associated with the typical impacts associated with construction works including disturbance, surface water run-off etc.

RES 5.1 G(d) provides a means for better informing developers/ owners/ occupiers of the benefits of renewable energy technologies. This objective is therefore extremely positive on PHH, CF, CMM, CMA and MA as it is only through awareness by developers and the general public that changes can be made to increase renewable energy technologies and therefore having a positive impact on human health and reducing GHGs.

Discussion

RES 5.1 G(e) and RES G(f) are similar to **RES 5.1 G(d)** as the development of sustainable communities and the promotion of sustainable energy practices in industry and commerce will result in the reduction in energy usage e.g. smarter travel and cleaner technologies will have positive impacts on the environment mainly on PHH, CF, CMM, CMA, AQ and MA.

RES 5.1 G(g) and G(j) are similar in that they both support education and research in energy efficiency. The objectives are positive for the protection of the environment in relation to the types of energy efficiency measures that are undertaken. Many renewable energy technologies are in their infancy and there is still more information required to understand the short, medium and long term impacts on the environment of these technologies.

RES 5.1 G(h) is positive as the identification of significant waste heat sources is the first step in trying to capture an energy resource that could be used for an alternative purpose. Negative impacts may arise to BFF, W, LS, CH and LandS as a result of the construction related impacts. Impacts to AQ will be both positive in terms of cleaner air quality however negative impacts may arise during the construction stage from noise or dust.

RES 5.1 G(i) has similar impacts to RES 5.1 G(a)-(c) above as with any infrastructure development there may be indirect negative impacts during the construction and or operation phase depending on the location of the infrastructure.

Proposed SEA Mitigation Measures:**General Mitigation**

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed Amendments to Objectives

- **RES 5.1 A:** To contribute towards the EU wide target of achieving at least 32.5 % improvement in energy efficiency *in line with national policy, proper planning and sustainable development.*
- **RES 5.1 F:** To encourage a high standard of sustainable energy efficiency and conservation in the existing building stock by encouraging developers, owners, and occupiers to improve the environmental performance of buildings and to promote the uptake in incentives, schemes, grants or other available funding to improve energy efficiency *in line with national policy, proper planning and sustainable development.*
- **RES 5.1 G(b):** Promoting retrofitting of existing buildings to achieve a high level of energy conservation, energy efficiency and use of renewable energy sources *in line with national policy, proper planning and sustainable development.*
- **RES 5.1 G(h):** To identify significant 'waste' energy sources in County Clare and to promote and facilitate the capture and conversion of such energy to a usable resource for local consumption *in line with national policy, proper planning and sustainable development.*

9.2.6 Chapter 6 – Onshore Wind

No objectives included.

9.2.7 Chapter 7 – Solar

Reference	Objectives
RES 7.1 Increase the penetration of commercial scale solar energy projects	<p>A. Increase the penetration of commercial scale solar energy development in appropriate locations.</p> <p>B. To favourably consider the redevelopment of brown field sites for large solar PV projects.</p> <p>C. To favourably consider the development of solar farms on agricultural lands which allow for farm diversification and multipurpose land use.</p>
RES 7.2 Promote integration of solar energy	<p>A. To promote and facilitate the use of solar technology across the County including schools, public offices and for infrastructure, e.g. traffic lights, streetlights, road information signage etc.</p> <p>B. To promote the integration of solar energy into existing and planned developments, particularly commercial and industrial buildings with large roof areas.</p>

Reference	Objectives
	C. To encourage the use of solar thermal or solar PV installations as part of the design and planning process for new developments and refurbishments.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 7.1 A	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 7.1 B	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 7.1 C	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 7.2 A	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 7.2 B	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 7.2 C	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AQ* – Air Quality; *CF* Climatic Factors; *CCM* – Climate Change Mitigation, *CCA* Climate Change Adaptation, *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

Discussion

RES 7.1 A: The evaluation of incorporating solar within new developments or existing development will have permanent positive impacts on CF, CCM, CCA and MA. Positive impacts will also be experienced by PHH, however negative impacts may be encountered during the construction stage as with any form commercial scale development due to traffic and other construction related impacts (noise, dust). Similarly, AQ will also experience both positive due to use of cleaner technologies and short term negative impacts due to potential dust during construction. As with any commercial development potential negative impacts may also occur from loss of biodiversity, water pollution etc.

RES 7.1 B: Redevelopment of brownfield sites by large solar PV projects is positive for PHH, CF, CCM, CCA and MA. There is always the potential for negative impacts on BFF in which certain species may have colonised the site and for issues relating to contamination of the site depending on the previous usage. Any development of large solar PV will have to assess the sensitivity of the surrounding landscape.

RES 7.1 C: specifically promotes development of solar farms on agricultural lands and whilst positive for PHH, CF, CCM, CCA and MA negative impacts may occur to AQ, BFF, W, LandS, CH and LS. Any development of large solar PV will have to assess the sensitivity of the surrounding landscape and the landuse.

RES 7.2 A-C: As with Objectives RES 7.1 A and B, these are considered to have positive impacts on PHH, CF, CCM, CCA and MA however negative may arise as outlined above under RES 7.1. All development must comply with environmental legislation and be sympathetic in relation to impacts on the landscape and existing buildings of architectural merit

Proposed SEA Mitigation Measures:

General Mitigation

As per Chapter 3 - new objectives to be included in Chapter 1.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed New Objective

It is an objective to undertake a feasibility study/strategy in relation to solar farm development within County Clare. The study would outline all of the potential environmental and technical (grid connection) constraints and/or opportunities associated with solar development at the identified sites allowing CCC to plan ahead to ensure planned development of solar infrastructure across the county and avoiding potential for cumulative environmental impacts on landscape, landuse etc. and allowing for proper planning and sustainable development.

Proposed Amendments to Objectives

- RES 7.1:** Increase the penetration of commercial scale solar energy projects **in line with national policy, proper planning and sustainable development.**
- RES 7.2:** Promote integration of solar energy **in line with national policy, proper planning and sustainable development.**

9.2.8 Chapter 8 – Bio-Energy

Reference	Objectives
RES 8.1 Increase the penetration of bio-energy projects	<p>A. To maximise bio-energy use in the County in order to make a proportional contribution to meeting, or exceeding, national targets for renewable heat and transport of 24% and 10% respectively by 2030.</p> <p>B. To facilitate an increase in the percentage of sustainable energy crops grown throughout County Clare, to prepare a suite of measures that will assist in developing the market for biomass energy crops and facilitate such alternative farm enterprise.</p> <p>C. To support initiatives for energy research funding and to encourage the development of bioenergy opportunities, facilities and associated rural enterprises in the countryside in appropriate locations where such activities do not have a significant negative impact on the environment and where they assist in the diversification away from fossil fuels to green energy.</p> <p>D. Development of biomass crops such as willow or miscanthus will consider potential environmental effects in relation to land use changes and in particular will assess potential for likely significant effects on Natura 2000 sites and other environmental sensitivities as identified by the EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool. Sustainable best practice in the growing of biomass and in the associated forestry management shall be encouraged:</p> <ul style="list-style-type: none"> The planning of biomass will be in accordance with the following guidance: Miscanthus Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011); and Short Rotation Coppice Willow Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011)
RES 8.2 Support Bio-energy development	<p>A. To support and encourage the development of bio-energy opportunities, facilities, and associated enterprises having regard to the effects of land use change.</p> <p>B. To encourage commercial bio-energy proposals to satisfy the following criteria:</p> <ul style="list-style-type: none"> To ensure that any commercial bio-energy plant is close to the point of demand and is served by public roads with sufficient capacity. In a central location within the supply catchment area in order to minimise road hauls. Located close to the point of demand to facilitate sustainable district heating networks. Proximate to grid or gas network or large heat demand end users. In line with national policy and proper planning and sustainable development.
RES 8.3 Brownfield and industrial bio-energy development	To generally permit proposals for commercial bio-energy plants on brownfield sites adjacent to industrial / enterprise areas or on lands which are in industrial / enterprise use or zoned for such purposes.
RES 8.4 Bio-energy promotion	<p>A. To facilitate an increase in the percentage of sustainable energy crops grown throughout County Clare, to prepare a suite of measures that will assist in developing the market for biomass energy crops and facilitate such alternative farm enterprise.</p> <p>B. To promote the installation of district heating schemes.</p> <p>C. To implement best practice in 'green' public procurement.</p> <p>D. To showcase the wood biomass boiler at the Clare County Council headquarters for demonstration purposes and to promote the use of biomass heating for all public buildings within the lifetime of this strategy.</p>
RES 8.5 Transportation and Access	To facilitate the development of new or upgrading of existing entrances and off road turning and loading areas to forest plantations, in association with Coillte, The Forest Service, Teagasc, The Clare Wood Energy Project and relevant land owners subject to all environmental considerations.
RES 8.6 Monitoring Land Use Change	To explore ways to monitor land use change, particularly in relation to energy crops, forestry and other energy related changes that may have implications for land-use, landscape and biodiversity across the County.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 8.1 A	+/-	0/-	0/-	0/-	+/-	+	+	+	+/-	0/-	+0

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 8.1 B	+/-	0/-	0/-	0/-	+/-	+	+	+	+/-	0/-	+0
RES 8.1 C	+/-	+/-	+/-	+/-	+/-	+/-	+	+	+/-	+/-	+
RES 8.1 D	+	+	+	+	+	+	+	+	+	+	+
RES 8.2 A	+/-	0/-	0/-	0/-	+/-	+	+	+	+/-	0/-	+0
RES 8.2 B	+/-	0/-	0/-	0/-	+/-	+	+	+	+/-	0/-	+0
RES 8.3	+/-	0/-	0/-	0/-	+/-	+	+	+	+/-	0/-	+/-
RES 8.4 A	+/-	0/-	0/-	0/-	+/-	+	+	+	+/-	0/-	+0
RES 8.4 B	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+0
RES 8.4 C	+	+	+	+	+	+	+	+	+	+	+
RES 8.4 D	+	0	0	0	+	+	+	+	0	0	+
RES 8.5	+	0/-	0/-	0/-	+/-	0	0	0	0/-	0/-	0/+
RES 8.6	+	+	+	+	+	+	+	+	+	+	+

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AQ* – Air Quality; *CF* Climatic Factors; *CCM* – Climate Change Mitigation, *CCA* Climate Change Adaptation, *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

Discussion

RES 8.1 A: Increases in bio-energy usage will have positive impacts on PHH, CF, CMM, CCA and MA through improved security of energy supply and reduction of GHGs. However, there are potential impacts on the environment from bio-energy and depending on the type of technologies used there is potential for impacts as outlined in **Table 9.1.3** of this SEA document. Key issues include potential displacement of agricultural land, traffic and associated noise and dust, light and noise pollution during operation, seepage etc

RES 8.1 B: The objective does not outline the location of the supply of biomass but suitable areas are set out within the Strategy. This would have potential negative impacts on BFF through the introduction on non-native species and non-native crops. There could be negative impacts on watercourses from eutrophication and on the surrounding landscape due to large volumes of one crop being planted. There could also be conflict with the agricultural sector in reducing areas for food output. However, the production of biomass is positive in relation to a renewable energy product and the knock-on reduction in GHGs. For the population within Clare there could be increased employment and security in energy supplies but also negative impacts from increased traffic on the roads or loss of food source.

As stated previously, the Draft RES has identified areas suitable for the planting of willow and miscanthus within County Clare. This suitability assessment was conducted by SEAI which used GIS to identify the suitability of land for growing energy crops based on a weighted assessment of the suitability of soil type, rainfall, slope, aspect and height. The suitability assessment did not take into account environmental restrictions.

RES 8.1 C has been added as a result of the SEA mitigation incorporated from iterative assessment of the draft RES. The objective does not specify locations for where such initiatives would be established and as for any development, there is potential for environmental impacts, e.g. for BFF, W, and LS, where for instance land use change is occurring to facilitate research, and potential negative direct or indirect impacts on LandS and CH. The new objective aims to be broadly positive, particularly for PHH, LS and CF/CC, as it aims to support energy research initiatives. The positive impacts are likely to be realised over the longer-term as research becomes established and data can be gathered which then be applied.

RES 8.1 D has also been added as a result of the SEA mitigation incorporated from iterative assessment of the draft RES. The positive impacts relate to the application of GIS tools and best practice in relation to examining land use changes, and in particular specifically acknowledges Natura 2000 sites.

RES 8.2 A and B: These objectives are largely positive (AQ, CF, CCM, CCA, MA) as it promotes the development of bio-energy opportunities but has supporting sub objectives taking into account the various environmental issues associated with bio energy including traffic on roads, land use change, proximity to grid connection etc. Whilst the objective has potential to impact negatively on BFF, LS, W, PHH, CH and LandS the objective aims to reduce any negative impacts through the mitigation already incorporated into the objective.

RES 8.3: The focus of bio-energy plants to brownfield sites or lands zoned for industrial/ enterprise use is positive on the environment. There is always the issue that lands may have local ecological potential and contain protected species or have legacy issues associated with contamination of soils. As with any development there are potential impacts on

Discussion

the environment from the construction and operation of such a facility but the reduction in GHGs will have positive impacts on the environment.

RES 8.4 A is the same as RES 8.1B therefore the same assessment applies.

RES 8.4 B: As with any development there is potential for negative impacts on the environment and while district heating will reduce fossil fuel consumption there could be minor negative impacts on BFF, W, SL, CH and LandS.

RES 8.4 C: The implementation of best practice in green public procurement will have positive impacts on all of the SEOs.

RES 8.4 D: The active promotion by the Council of showcasing a wood biomass boiler is very positive for PHH, CF, CCM, CCA and MA. This is a positive step to outline to the public and developers the benefits attached to biomass heating.

RES 8.5: The facilitation of upgrading to entrances will mainly have neutral impacts on the environment but there is always the potential to have minor impacts if new entrances are developed due to loss of hedgerows for example, run off during construction etc.

RES 8.6 has been added as a result of the SEA mitigation incorporated from iterative assessment of the draft RES. Directly positive impacts across all receptors are anticipated to be realised, particularly in the longer-term as data is gathered, as it relates to exploring ways that CCC can monitor land use changes. This would be a positive step in terms of building the evidence base as it relates to energy crops and to ensure that high quality agricultural land or areas of biodiversity value (including those outside of protected sites) for instance are not lost in a trade-off for developing bioenergy. Monitoring land use change also has important implications for maintaining carbon sinks.

Proposed SEA Mitigation Measures:

General Mitigation

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

All general mitigation measures have been included in draft RES Chapter 1 as part of RES 1.1

Proposed New Objectives

Suggest adding new objectives as follows:

- **To support initiatives for energy research funding and to encourage the development of bioenergy opportunities, facilities and associated rural enterprises in the countryside in appropriate locations where such activities do not have a significant negative impact on the environment and where they assist in the diversification away from fossil fuels to green energy.**
Mitigation has been incorporated into the RES 8.1 objective as RES 8.1 D
- **Planning applications for biomass crops such as willow or miscanthus will consider potential environmental effects in relation to land use changes and in particular will assess potential for likely significant effects on European sites and other environmental sensitivities as identified by the EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool. Sustainable best practice in the growing of biomass and in the associated forestry management shall be required:**
 - **The planning of biomass will be in accordance with the following guidance: Miscanthus Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011); and**
 - **Short Rotation Coppice Willow Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011)****Mitigation has been incorporated into the RES 8.1 objective as RES 8.1 D**
- **It is an objective to monitor any land use change due to biomass/energy crops to ensure avoidance of impacts to the receiving environment including biodiversity and agriculture.**
Mitigation has been incorporated as new objective RES 8.6

Proposed Amendment to Objective

- **RES 8.4 B: To promote the installation of district heating schemes in line with national policy, proper planning and sustainable development.**

9.2.9 Chapter 9 – Marine Renewables

Reference	Objectives
RES 9.1 Support the National Marine Planning Framework	<p>A. To implement and support the streamlined consent system, connection arrangements, and the funding supports for new technologies offshore.</p> <p>B. To promote regional cooperation in terms of offshore renewable energy development, environmental monitoring and awareness of the benefits of realising the Regions' offshore energy potential</p>
RES 9.2 Facilitate the development of Marine Renewables	<p>A. To support the ocean energy research, development and demonstration pathway for emerging marine technologies (wave, tidal, floating wind) and associated test infrastructure.</p> <p>B. To support the sustainable development of renewable wind energy (on shore and offshore) at appropriate locations and related grid infrastructure.</p> <p>C. To maximise the opportunities provided by the Shannon Estuary's strategic location and its' deep water for marine renewable energy development.</p>
RES 9.3 Strategic Marine Energy Infrastructural Development	<p>A. To work in partnership with the marine renewable energy sector (wave, tidal and offshore), DECC, EirGrid and other relevant stakeholders to deliver the key actions recommended by the Ocean Renewable Energy Development Plan (OREDPA) and DS3 Programme, ensuring that electricity generated off the coast of County Clare can be exported to the demand market subject to the requirements of all environmental legislation and taking into account the OREDPA SEA Environmental Report and the Natura Impact Report.</p> <p>B. To support the strengthening of the electricity grid to accommodate offshore renewable energy and its connection to the national grid.</p> <p>C. To enable facilities on shore to convert renewable energy generated offshore to be transformed, stored, converted and transported effectively.</p>
RES 9.4 Marine Energy Service and Port Infrastructure	<p>A. To actively explore and pursue opportunities to service the marine renewable energy sector at existing ports, to facilitate the growth of new ports, supporting infrastructure and associated development, in compliance with the Strategic Integrated Framework Plan for the Shannon Estuary and any future coastal zone management plans.</p> <p>B. To facilitate the expansion of ports and provision of additional quayside harbour working areas and /or additional quay length to further enhance their attractiveness to marine renewable industry developers.</p>
RES 9.5 Marine Energy Research and Development	<p>A. Support the ocean energy research, development and demonstration pathway for emerging marine technologies (wave, tidal, floating wind) and associated test infrastructure.</p> <p>B. Support innovation enterprise hubs and the supply chain for offshore renewable energy.</p>
RES 9.6 Forward Planning for Offshore Energy	To carry out feasibility studies and other forward planning initiatives to enable offshore renewable energy to develop while protecting the environment, maximising local economic and social benefit, and enabling efficient development of supporting infrastructure. This will be done in co-operation with relevant government departments and public agencies.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 9.1 A	+	+/-	+/-	+/-	+/-	+	+	+	+/-	+/-	+
RES 9.1 B	+	+/-	+/-	+/-	+/-	+	+	+	+/-	+/-	+
RES 9.2 A	+	+/-	+/-	0/-	+/-	+	+	+	+/-	+/-	+
RES 9.2 B	+/-	+/-	+/-	0/-	+/-	+	+	+	+/-	+/-	+
RES 9.2 C	+/-	+/-	+/-	0/-	+/-	+	+	+	+/-	+/-	+
RES 9.3 A	+/-	+/-	+/-	+/-	+/-	+	+	+	+/-	+/-	+
RES 9.3 B	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 9.3 C	+/-	0/-	0/-	0/-	+	+	+	+	0/-	0/-	+
RES 9.4 A	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 9.4 B	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+

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Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 9.5 A	+	+/-	+/-	0/-	+/-	+	+	+	+/-	+/-	+
RES 9.5 B	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 9.6	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AQ* – Air Quality; *CF* Climatic Factors; *CCM* – Climate Change Mitigation, *CCA* Climate Change Adaptation, *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

Discussion

RES 9.1A and RES 9.1B—relates broadly to administrative arrangements for facilitating offshore marine development and in this regard is positive in relation to contributing towards meeting energy targets and may also have positive impacts in relation to employment and reduction in GHG emissions. The objectives are also positive as they result in improved coordination and improved monitoring of potential impacts.

RES 9.1 to 9.3 are positive objectives to assist with the delivery of the OREDP and the National Marine Planning Framework, but there is potential for negative impacts to BFF/W/LS/CH/LandS both during the short term construction phase and long term permanent loss of seabed associated with any RE infrastructure that may emerge from funding, research and coordination. Negative impacts to AQ could also occur during the construction phase from increased noise and dust.

RES 9.2A/B/C relate to facilitating the development of RE infrastructure via testing, construction of infrastructure in the marine environment or associated land requirements including for example substations, grid connections or port development. Whilst the associated impacts are deemed positive for AQ, CF, CCM, CCA and MA as a result of reduction in GHG emissions and use of cleaner technologies. By developing the offshore renewables there is associated positive impacts to landuse, terrestrial BFF and LandS due to reduced pressure from onshore development or land based renewable technologies.

As with any form of development there are however potential “on the ground” short term negative impacts associated with the construction phase to PHH and AQ from traffic, BFF/LS due to loss of seabed or habitats and to W from sediment or pollution via incidents or spillages, CH from indirect impacts to unknown archaeology in the seabed. Long term negative impacts may also occur to BFF, LandS and W during the operational stage due to turbines impacting on flight paths or marine mammals, visual impacts to seascape or ongoing pollution due to maintenance and impact on wave and tidal patterns etc

The development of a new port, expansion of an existing port and/ or associated infrastructure has the potential to have significant impacts on the environment. While there are positive impacts to AQ, CF, CCM, CCA and MA many of the impacts are unknown or could have negative impacts on BFF, PHH, W, LS, W, CH and LandS. Negative impacts to AQ could also occur during the construction phase from increased noise and dust.

Specific to **RES 9.2 C** the entirety of the Shannon Estuary is an SAC and SPA. In-direct impacts may occur where poor water quality problems persist which are rooted in technical or construction choices at site. This may lead to impacts on human health (PHH). Depending on the type of proposal there may be negative direct and in-direct effects on the WFD status of the water body within which the proposal is contained. Direct access to any site located on the estuary may require up-grade to allow sufficient capacity; the local up to national road network should be sufficient.

Whilst it is acknowledged that the RES support that any associated development of new ports will be subject to proper planning and in compliance with all environmental legislation It is also recommended that a feasibility study be undertaken in relation to any new port development and this study would outline all of the potential environmental and technical (grid, depth of water) issues associated with port development at the identified sites.

RES 9.3 A: The development of a new port, expansion of an existing port and/ or associated infrastructure has the potential to have significant impacts on the environment. There are positive impacts in relation to PHH, CF, CMM, CMA but many of the impacts are unknown or could have negative impacts on BFF, PHH, W, S/L, CH and LandS.

RES 9.3 B and C support the development of the onshore grid to facilitate offshore marine renewables. Again, whilst these objectives are positive in relation to PHH due to the generation of employment opportunities and a sustainable energy source, they are also negative due to likely increase in construction related traffic and noise. There are positive impacts in relation to CF, CMM, CMA and MA but potential short -term negative impacts to BFF, LS, W, CH and LandS during the construction phase.

RES 9.4 A and B support expansion of the Ports within County Clare and the impacts are similar to **RES 9.3A**

RES 9.5 A is the same objective as Objective 9.2A and therefore the impacts are similar and discussed above under RES 9.2 A.

Discussion

RES 9.5 B which supports innovation enterprise hubs and the supply chain for offshore renewable energy will have similar impacts to that for RES 9.3B and C in that the proposed infrastructure and construction phase may have short and long term negative impacts to AQ, BFF, PHH W, LS, LandS and CH depending on the location of the hubs.

RES 9.5 B is positive in relation to contributing towards meeting energy targets and may also have positive impacts in relation to employment and reduction in GHG emissions resulting in positive impacts to PHH, CF, CMM, CMA and MA.

RES 9.6 aims to carry out feasibility studies to enable offshore renewable energy to develop, while also acknowledging the need to protect the environment as well as maximising social/economic benefits for locals. This objective is directly positive in the medium and longer-term in particular as it relates to expanding the evidence base. However as it also relates to enabling development, this has the potential for knock-on impacts for BFF, W, LS, LandS and CH.

Proposed SEA Mitigation Measures:

General Mitigation

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed New Objective

- **To undertake a feasibility study of infrastructure (port, onshore grid, landfall locations etc) in relation to any new port development. The study would outline all of the potential environmental and technical (grid, depth of water) constraints and/or opportunities associated with port development at the identified sites allowing CCC to plan ahead to enable/facilitate offshore energy in line with national policy, proper planning and sustainable development.**

Proposed Amendments to Objectives

- **RES 9.1 A, RES 9.2 B and C** should also include the following at the end of the Objective: **...and in line with national policy, proper planning and sustainable development.**
- **RES 9.3 A** should be amended to state: To work in partnership with the marine renewable energy sector (wave, tidal and offshore), DECC, EirGrid and other relevant stakeholders to deliver the key actions recommended by the Ocean Renewable Energy Development Plan (ORED P) and DS3 Programme, ensuring that electricity generated off the coast of County Clare can be exported to the demand market subject to the requirements of all environmental legislation **and in accordance with the ORED P SEA Environmental Report and the Natura Impact Report.**

Mitigation has been incorporated as part of the objective.

9.2.10 Chapter 10 – Microgeneration

Reference	Objectives
RES 10.1 Support the framework for microgeneration	A. To support the national framework for micro-generation which tackles the existing barriers and establishes suitable supports within relevant market segments.
	B. To promote the uptake of incentives, schemes, grants and other available funding to improve energy efficiency.
RES 10.2 Facilitate micro-renewable energy installations	A. To encourage the retro fit of domestic and commercial buildings with micro generation technologies and improve the environmental performance of buildings.
	B. To promote the use of micro-renewable technologies throughout the County for all redevelopment / extension / expansion projects
	C. To encourage all developers at planning application stage for new buildings in the residential, industrial, commercial and agricultural sectors to demonstrate how the energy needs of the proposed development can be provided for with indigenous renewable energy resources, harnessed by incorporating micro renewable technologies, as an important element in establishing a low carbon County and assisting in meeting assigned renewable energy targets.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 10.1 A	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 10.1 B	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 10.2 A	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 10.2 B	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 10.2 C	+	0	0	0	0	+	+	+	0	0/-	+

Key: PHH – Population and Human Health; BFF – Biodiversity, Flora and Fauna; LS – Soils and Geology; W – Water; AQ – Air Quality; CF – Climatic Factors; CCM – Climate Change Mitigation, CCA – Climate Change Adaptation, MA – Material Assets; CH – Cultural Heritage; LandS – Landscape.

Discussion

RES 10.1A and B broadly relate to administrative arrangements for facilitating micro generation technologies to domestic and commercial properties. Micro renewables can include a range technology; solar, small wind turbines, micro CHP plants, hydroelectric schemes and ground source heat pumps.

This objective is positive for P/HH, AQ/CF/ CCM, CCA and MA through the harnessing of energy efficiency micro renewable technologies to establish a low carbon county at a local level. However, the development of these technologies has the potential to impact to a certain extent on the natural environment, BFF, W, SL, CH, AQ and LandS and therefore the planning applications will require an environmental appraisal. It will depend on the type of micro renewable technologies that are used as to the type of potential impacts on the natural environment. The potential for cumulative impacts on these criteria will also require assessment

Similarly, **RES 10.2 A and B** which relate to retro-fitting of existing buildings with micro technologies is positive to P/HH, AQ/CF/ CCM, CCA and MA but may have negative impacts to AQ/BFF, W, SL, CH and LandS.

RES 10.2 C has been incorporated as been added as a result of the SEA mitigation incorporated from iterative assessment of the draft RES as such is broadly positive for PHH, MA, CF and CC. While positive, there are potential for impacts on the receiving environment in general and in particular built heritage and as such an environmental appraisal is recommended as part of planning applications.

Proposed SEA Mitigation Measures:

General Mitigation:

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed New Objective

- To require all planning applications for new buildings in the residential, industrial, commercial and agricultural sectors throughout County Clare to demonstrate how the energy needs of the proposed development can be provided for with indigenous renewable energy resources, harnessed by incorporating micro renewable technologies, as an important element in establishing a low carbon County and assisting in meeting assigned renewable energy targets.

Mitigation has been incorporated as new objective RES 10.2 C

- All planning applications must be accompanied by an environmental appraisal outlining the potential impacts and required mitigation measures to reduce impacts on the natural environment and any potential impacts on architecture.

9.2.11 Chapter 11 – Micro Hydroelectric Power

Reference	Objectives
RES 11.1 Facilitating Micro Hydro Power	To facilitate the development of micro hydro power developments on a case by case basis, where proposals comply with requirements of the Habitats Directive, Birds Directive, the River Basin Management Plan, the provisions of the Clare County Development Plan 2023 - 2028, with the 'Guidelines on the Planning, Design, Construction and Operation of small scale hydroelectric schemes and Fisheries' (DCENR and Inland Fisheries Ireland and other related legislation/ guidance that is available , in accordance with proper planning and sustainable development.

Reference	Objectives
RES 11.2 Environmental safeguards specific to Micro Hydro Power	<p>It is an objective of Clare County Council to ensure environmental protection in relation to the development of Micro Hydro Power (MHP) projects.</p> <ul style="list-style-type: none"> – An Ecological Impact Assessment should be carried out to identify all ecological factors, including ecological corridors. The assessment should include appropriate surveys, undertaken at the correct time of year by a suitability qualified and experienced ecologists, and including appropriate mapping of habitats. – A number of plant species protected under the Flora Protection Order, 1999, may occur in some of the identified areas. Breeding sites and resting places of otter, and potentially of bats will require survey for these species to comply with the Wildlife Acts and Regulations. – Development of MHP must be undertaken in a sustainable manner with regard to the fisheries resources within the river. This will include assessment of the fisheries resource and appropriate design mitigation measures. Developments of MHP must ensure that they do not impede the ability for fish to migrate upstream, such as fish passes. Consultation will be required with the IFI in relation to the development of any of the MHP sites identified in this strategy. – A full archaeological, and/or architectural heritage assessment may be required in relation to any proposed application in relation to MHP.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 11.1	+	0/-	0	0/-	+	+	0/+	+	0/-	0/-	+
<i>Identified locations with potential for commercial micro-hydroelectric power</i>											
Cahermacon	+	0/-	0/-	0/-	+	+	0/+	+	0	0	+
Ennistymon	+	0/-	0/-	0/-	+	+	0/+	+	0	0	+
Old Mill, Ennis	+	-	0/-	-	+	+	0/+	+	0/-	0/-	+
Moananagh Bridge, Inagh	+	-	0/-	-	+	+	0/+	+	0/-	0/-	+
Clondegad, Ballynacally	+	0/-	0/-	0/-	+	+	0/+	+	0/-	0/-	+
The Weir, Sixmilebridge	+	0/-	0/-	0/-	+	+	0/+	+	0/-	0/-	+
RES 11.2	+	+	+	+	+	+	+	+	+	+	+

Key: **PHH** – Population and Human Health; **BFF** – Biodiversity, Flora and Fauna; **LS** – Soils and Geology; **W** – Water; **AQ** – Air Quality; **CF** Climatic Factors; **CCM** – Climate Change Mitigation, **CCA** Climate Change Adaptation, **MA** – Material Assets; **CH** – Cultural Heritage; **LandS** – Landscape.

Discussion

Under **RES 1.1**, it is an objective to facilitate the development of MHP on a case by case basis. The RES states that it is beyond the scope of the RES to assess flow and head data for each potential location (together with other site suitability considerations), however it does identify six commercial sites with potential to harness micro-hydroelectric power (MHP):

Cahermacon (SEAI Hydro Mapping Site No. 22)

The MHP site is located in the headwaters of the River Fergus (Fergus_010). This stretch is not designated for European sites or Natural Heritage Areas; however this stretch is designated as a salmonid water body under the SI 293/1988 Regulations (as amended) and is an important fisheries river. The Fergus_010 is classed as having Good WFD ecological status for 2013-2018, and is Not at Risk of meeting its WFD objectives. There could be significant impacts on BFF, W and LS in particular from MHP development should it impede fish passage or other lifecycle elements, or cause hydromorphological changes to fisheries habitat.

The MHP site is located within the landscape character area of Miltown Malbay Coastal Farmland. Development at this site would be overall positive for PHH and subsequent positive impact in relation to CF/CCM/CCA and MA. There are no recorded heritage features in the vicinity, therefore impacts to CH and LandS are likely to be broadly neutral.

Ennistymon, Cullenagh (SEAI Hydro Mapping Site No. 33)

The MHP site is located on the River Inagh (Inagh (Ennistymon)_050). This stretch is not designated for European sites or Natural Heritage Areas. The Inagh River Estuary Sac is located approximately 400m downstream of the site. The Inagh (Ennistymon)_050 is classed as having Moderate WFD ecological status for 2013-2018, and is At Risk of

Discussion

meeting its WFD objectives. There could be significant impacts on BFF, W and LS in particular from MHP development. The MHP site is located within the landscape character area of Cliffs of Moher and Lahinch. Development at this site would be overall positive for PHH and subsequent positive impact in relation to CF/CCM/CCA and MA. There are no recorded heritage features in the vicinity, therefore impacts to CH and LandS are likely to be broadly neutral.

Moananagh Bridge Inagh (SEAI Hydro Mapping Site No. 48)

The proposed MHP located at Moananagh Bridge has not previously been developed for hydro-power. The MHP is also located on the Inagh River (Inagh (Ennistymon)_050) but further upstream than the Ennistymon, Cullenagh site. As this is the same water body, it has Moderate WFD ecological status and is At Risk of not meeting its WFD objectives.

This stretch is not designated for European sites, Natural Heritage Areas nor as a designated salmonid river. However the 2009 report on *Micro Hydro Electricity Potential in County Clare* noted this river is an important fisheries resource, therefore development has the potential to impact on the migration of fish, or on fisheries habitat due to hydromorphological changes. The Inagh River Estuary SAC is located downstream at Ennistymon. There could be impacts on BFF, LS and W from development at this location.

The MHP site is located within the landscape character area of Cullenagh River Farmlands. There are no county scenic routes or walkways in proximity to the site. The closest main populated area is Inagh located to the south. The development of MHP at this site would be positive for PHH, namely local populations, should it provide local communities with power. It is a positive means of contributing to renewable energy targets and will be positive in relation to CF/CCM/CCA and MA. There are two archaeological sites south of the MHP site, a fulacht fia and a cairn but they will not be directly impacted on by the MHP. Moananagh Bridge itself is on the Clare Record of Protected Structures (RPS) and also the National Inventory of Architectural Heritage (NIAH), so development on or near the bridge may have impacts for CH and may require an architectural survey.

Old Mill Wheel Ennis (SEAI Hydro Mapping Site No. 169)

The Old Mill site has a historical history of hydro-power activity at the site and there is an existing sluice and fish pass on the river. The MHP site is located on the River Fergus which is part of the Lower River Shannon SAC. The river water body (Fergus_060) is classed as having Poor WFD ecological status and is At Risk for 2013-2018 at the location of the proposed MHP. There could be significant impacts, including cumulative, on BFF, W and LS from development at this location. Hydromorphological impact is the single significant pressure on this water body, and this section of the River Fergus is part of an OPW Drainage District and subject to channelisation.

The MHP site is located within the landscape character area of Ennis Drumlin Farmland and within the urban fabric of Ennis town. Development at this site would be positive for the community of Ennis and provide a positive impact in relation to CF/CCM/CCA and MA. There are archaeological sites in proximity to this location, including a water mill and a mill race, and therefore there could be impacts to CH and LandS and an archaeological survey may be required.

Clondegad, Ballynacally

The MHP site at Clondegad, Ballynacally is located on the Owenslieve River (Owenslieve_020) at a location where there is a natural waterfall. A hydro-electric installation had previously operated at this site, providing electricity to the landowner's dwelling. However it went into disservice and the original turbine was removed.

The river is not designated at this location however it flows into the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA. The Owenslieve_020 water body is classified as having Moderate WFD ecological status and is At Risk for 2013-2018, with the significant pressure being impacts from agriculture issues. The waterfall has a vertical drop of 8 metres, and would be impassable to fish heading upstream. However development could result in impacts, including cumulative, on BFF, W and LS from development at this location.

The MHP site is located within the landscape character area of Fergus Estuary and there is a county walkway to the north of the site. The site is directly south of a 400kV overhead powerline which would not be affected from development of MHP. There are a number of archaeological sites in proximity to this location, including Clondegad Bridge, which is an RPS and NIAH, and an archaeological survey may be required. Development at this site would be positive for surrounding communities and provide a positive impact on CF/CCM/CCA and MA.

The Weir, Sixmilebridge

The MHP site is located within on the Owenogarney River (Owenogarney_050) within the town of Sixmilebridge. There is a long history of hydro-power activity along this river dating back to 1664. This stretch of the river is not designated as a European or national site, but the Lower River Shannon SAC is located downstream. The Owenogarney_050 water body is classified as having Good WFD ecological status and is Not at Risk for 2013-2018.

The MHP site is located within the landscape character area of Sixmilebridge Farmland, however the MHP would be located within or on the boundary of the town of Sixmilebridge. Development at this site would be positive for PHH and the Sixmilebridge community, and would provide a positive impact in relation to CF/CCM/CCA and MA. There are archaeological sites in proximity to this location, including an RPS on a bridge.

Discussion

Summary of the Issues

There are a number of key issues in relation to the four potential MHP sites identified, and each of the sites are environmentally constrained by a number of factors including potential for direct impacts in particular on BFF, W, LS and CH. The development of MHP will require detailed ecological assessments and/ or avoidance due to the sensitivity and the potential for significant long term impacts on biodiversity and hydromorphology in particular. The progression of any particular MHP site will need to ensure that a range of mitigation measures are incorporated in the draft RES to address these issues, as outlined below.

RES 1.2 incorporates a number of environmental considerations as a result of iterative feedback from the SEA process. As such, this is a positive objective inclusion across all environmental receptors.

Proposed SEA Mitigation Measures:

General Mitigation

As per Chapter 3 - new objectives to be included in Chapter 1.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed Amendment to Objective

- **RES 11.1:** To facilitate the development of micro hydro power developments on a case by case basis, where proposals comply with requirements of the Habitats Directive, Birds Directive, the **relevant** River Basin **District** Management Plan, the provisions of the Clare County Development Plan 2023 - 2028, with the 'Guidelines on the Planning, Design, Construction and Operation of small scale hydro electric schemes and Fisheries' (DECC and Inland Fisheries Ireland) and other related legislation/ guidance that is available, in accordance with proper planning and sustainable development.

Proposed amendments have been incorporated.

Proposed New Objectives

- **An Ecological Impact Assessment should identify all ecological factors, including ecological corridors, be accompanied by appropriate surveys, undertaken at the correct time of year and be undertaken by a suitability qualified and experienced ecologists. Details of the habitats impacted by the MHP will be required, including descriptions of protected species recorded and mapping of habitat locations and extents. The habitat mapping should be in accordance with best practice guidance.**
A version of the mitigation has been incorporated as part of RES 11.2
- **There are a number of plant species protected under the Flora Protection Order, 1999, which may potentially occur in some of the identified areas. Also, there are breeding sites and resting places of otter, and potentially of bats, (both of which are strictly protected under S.I. No. 477 of 2011, as amended), within the MHP areas this will require both survey for these and to comply with the Wildlife Acts and Regulations.**
A version of the mitigation has been incorporated as part of RES 11.2
- **Development of MHP must be undertaken in a sustainable manner with regard to the fisheries resources within the river. Developments of MHP must ensure that they do not impede the ability for fish to migrate upstream. Should a weir be required to be constructed in order to manage the flow to the turbine, a fish pass will be required to be integrated to ensure that there is an attractive upstream path for the fish. Each fish pass will be required to be designated in accordance with the fish species contained within the relevant river. All fish passes should be agreed with IFI.**
A version of the mitigation has been incorporated as part of RES 11.2
- **Consultation will be required with the IFI in relation to the development of any of the MHP sites identified in this strategy.**
Mitigation has been incorporated as part of RES 11.2
- **A full archaeological, architectural and/or landscape assessment may be required in relation to any proposed application in relation to MHP.**
Mitigation wording has been incorporated as part of RES 11.2
- **Any micro hydro development shall adhere to the overarching environmental objective RES 1.1.**
- **Any micro hydro power development shall be subject to the appropriate hydrological, hydromorphological and environmental assessments as required. In addition, the cumulative effect of multiple hydro power developments shall be considered at earliest stage within planning and design process.**

9.2.12 Chapter 12 – Renewable Heat

Reference n	Objectives
RES 12.1 Support the framework for Renewable Heat	<p>A. To maximise renewable heat technologies in the County in order to make a proportional contribution to meeting, or exceeding, national targets for renewable heat of 24% by 2030.</p> <p>B. To support the national framework for renewable heat which tackles the existing barriers and establishes suitable supports within relevant market segments.</p> <p>C. To promote the uptake of incentives, schemes, grants and other available funding to improve renewable heat.</p> <p>D. To seek ways to incentivise large heat users to adopt renewable heat solutions.</p> <p>E. Set green procurement targets for the public sector at a minimum of 20% mandate and ensure all new or replacement heating systems are 100% renewable.</p>
RES 12.2 Promotion of renewable heat technology	<p>A. To encourage the use of renewable heat solutions as part of the design and planning process for new developments and refurbishments.</p> <p>B. To support and facilitate the installation of District Heating technologies in new developments.</p> <p>C. To facilitate the development of Combined Heat and Power plants for District Heating in industrial zoned areas.</p> <p>D. To support the use of renewable heat in residential and commercial developments, such as heat pumps.</p>
RES 12.3 Development and dissemination of geothermal potential	To utilise the GSI's shallow geothermal energy resource map and other available data sources, including environmental information, when available to identify the areas most suitable for shallow geothermal installations and to enable better informed decision making and preliminary site suitability assessments.
RES 12.4 Facilitation of ground collection and heat pump energy installations	<p>A. To protect wells, aquifers and other water courses in the development of shallow geothermal resources in accordance with the National River Basin Management for Ireland 2022-2027 and in accordance with the requirements of the Water Framework Directive, the Habitats Directive and Birds Directive.</p> <p>B. To promote the use of ground collection heat pump energy technology across County Clare, including schools and other public buildings.</p>

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 12.1 A	+/-	0/-	0/-	0/-	+/-	+/-	+/-	+/-	0	0	+
RES 12.1 B	+	0	0	0	+/-	+/-	+/-	+/-	0	0	+
RES 12.1 C	+	0	0	0	+/-	+/-	+/-	+/-	0	0	+
RES 12.1 D	+	0	0	0	+/-	+/-	+/-	+/-	0	0	+
RES 12.1 E	+	0	0	0	+/-	+/-	+/-	+/-	0	0	+
RES 12.2 A	+	0	0	0	+	+	+	+	0	0	+
RES 12.2 B	+	0	0	0	+	+	+	+	0	0	+
RES 12.2 C	+	0	0	0	+	+	+	+	0	0	+
RES 12.2 D	+/-	0	0	0	+	+	+	+	0	0	+
RES 12.3 A	+	0	+	0	+	+	+	+	0	0	+
RES 12.4 A	+	0	+	+	0	+	+	+	0	0	+
RES 12.4 B	+	0/-	0/-	0/-	0	+	+	+	0	0/-	+

Key: PHH – Population and Human Health; BFF – Biodiversity, Flora and Fauna; LS – Soils and Geology; W – Water; AQ – Air Quality, CF Climatic Factors; CCM – Climate Change Mitigation, CCA Climate Change Adaptation, MA – Material Assets; CH – Cultural Heritage; LandS – Landscape.

Discussion

RES 12.1 A relates to the overall ambition for Clare to help meet or exceed the national renewable heat (RES-H) target of 24% by 2030. Currently, 90% of Ireland's heat energy is derived from fossil fuel sources, with only 6.3% of RES-H as of 2019. This objective in a broad sense therefore has direct short, medium and long-term positive impacts across

Discussion

environmental objectives, namely CF/CCM/CCA, PHH and MA, as the aim is a reduction on fossil fuel dependency in the heat generation sector, and the associated harmful environmental effects. At a national scale, the dominant source of RES-H is from biomass in industry. While a mix of fuel types are possible for RES-H, there are positive and negative aspects to AQ where biofuels are used, which are still a carbon-based fuel and have combustion-related air emissions.

The objectives do not outline the location of the supply of biomass, but it is presumed that a large amount could be grown within County Clare. This would have potential negative impacts on BFF through the introduction of non-native species and non-native crops. There could be negative impacts on W from eutrophication and on the surrounding landscape due to large monocultures being planted, and LS from land use change/soil erosion on conversion of tillage/arable land to biocrops. However, the production of biomass is positive in relation to a renewable energy product and the knock-on reduction in GHGs. For PHH within Clare, there could be increased employment and security in energy supplies. The draft RES has identified areas suitable for the planting of willow and miscanthus within County Clare. This suitability assessment was conducted by SEAI which used GIS to identify the suitability of land for growing energy crops based on a weighted assessment of the suitability of soil type, rainfall, slope, aspect and height, but did not take into account environmental restrictions.

RES 12.1 B – D are broadly positive as these objectives relate to supporting schemes and incentives, particularly for CF/CCM/CCA, PHH and MA.

RES 12.2 A, B and D are also broadly positive as these objectives support consideration of RES-H in new developments. **RES 12.2 C** relates to the development of CHP for DH in industrially-zones areas which is utilising the proximity principle, where large industrial users can leverage their processes to provide for RES-H; this can help avoid wasting heat resources. Supporting DH will therefore have long-term very positive impacts for PHH and MA as local populations can receive reduced energy bills and a security of supply. There is also benefits in relation to a reduction in the consumption of fossil fuels and therefore there are long-term direct positive impacts on CF and AQ. As with any development however there is the potential for negative impacts on the environment, and in particular for the short-term during the construction phase.

RES 12.3A is broadly positive across environmental objectives, particularly LS and PHH as these objectives are supportive of utilising environmental data and mapping, as well as best practice guidance, in relation to geothermal installations.

The **RES 12.4 A** objective is directly positive in relation to BFF, PHH, W and LS it will protect wells, aquifers and water courses in the development of shallow geothermal energy sources. The objective will ensure that development is in line with the Programme of Measures for the National River Basin Management Plan.

RES 12.4 B relates to the installation of ground collectors, heat pumps and geothermal energy installations, which are all directly positive in relation to PHH, CF/CCM/CCA and MA. There are potential impacts on the environment from geothermal and ground source heat pumps, which is dependent on the type of technologies used. The draft RES focuses on shallow geothermal and which has the potential for neutral to negative impacts on BFF, W, LS and CH, as there will be disturbance of the ground and subsurface, and there are potential for localised effects from changes to ground temperature. There is also potential for localised impacts on the water flow regimes for open loop water source heat pumps. Proper planning should ensure no impacts in relation to CH, but potential impacts could occur from previously undiscovered or subsurface features/remains.

Proposed SEA Mitigation Measures:

General Mitigation

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

As biomass is currently the dominant fuel source for RES-H, planning applications for biomass crops would need to consider potential environmental effects in relation to land use changes and in particular will assess potential effects European sites, NHAs and pNHAs.

Proposed Amendment to Objective

RES 12.4 A: *To protect wells, aquifers and other water courses in the development of shallow geothermal resources in accordance with the **National River Basin Management for Ireland 2018-2021 2022-2027** and **otherwise** in accordance with the requirements of the Water Framework Directive, the Habitats Directive and Birds Directive.*

Proposed amendments have been incorporated.

9.2.13 Chapter 13 – Renewable Transport

Reference	Objectives
RES 13.1 Renewable transport targets	To maximise renewable transport in the County in order to make a proportional contribution to meeting, or exceeding, national targets for renewable transport of 13.4% by 2030
RES 13.2 Accelerate electrification of private car fleet	<p>A. To support the deployment of publicly accessible charging infrastructure in the county.</p> <p>B. To encourage consumer change among households.</p> <p>C. To implement measures to improve EV charging in private developments, surpassing the minimum requirements of Part L of the Building Regulations where feasible.</p>
RES 13.3 Accelerate transition of commercial fleets to low carbon fuels	<p>A. To accelerate transition of commercial fleets to low carbon fuels.</p> <p>B. To support measures for alternative fuels from renewable sources (e.g. AD plants, biomethane, advanced biofuels) and related infrastructure (e.g. refuelling stations).</p> <p>C. To demonstrate leadership by transitioning Clare County Council own vehicle fleet to low carbon fuels.</p>

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 13.1	+/-	0/-	0/-	0/-	+/-	+	+	+	0	0	+
RES 13.2 A	+	0	0	0	+	+	+	+	0	0	+
RES 13.2 B	+	0	0	0	+	+	+	+	0	0	+
RES 13.2 C	+	0	0	0	+	+	+	+	0	0	+
RES 13.3 A	+	0	0	0	+	+	+	+	0	0	+
RES 13.3 B	+/-	0/-	0/-	0/-	+/-	+/-	+/-	+	0	0	+
RES 13.3 C	+	0	0	0	+	+	+	+	0	0	+

Key: **PHH** – Population and Human Health; **BFF** – Biodiversity, Flora and Fauna; **LS** – Soils and Geology; **W** – Water; **AQ** – Air Quality; **CF** Climatic Factors; **CCM** – Climate Change Mitigation; **CCA** Climate Change Adaptation; **MA** – Material Assets; **CH** – Cultural Heritage; **LandS** – Landscape.

Discussion

RES 13.1 relates to the overall ambition for Clare to help meet or exceed the national renewable transport (RES-T) target of 13.4% by 2030. In a broad sense, this has direct short, medium and long-term positive impacts across environmental objectives, namely CF/CCM/CCA, PHH and MA, as the aim is a reduction on fossil fuel dependency in the transport sector, and the associated harmful environmental effects.

There should be positive benefits for AQ also, as atmospheric pollutants such as NO_x, non-methane volatile organic compounds and particulate matter are the main tailpipe emissions from internal combustion engines, which should reduce with greater penetration of RES-T, with zero direct tailpipe emissions in some cases e.g. from electric vehicles (EVs).

RES 13.2 A – C relates to accessibility of public charging infrastructure and encouraging consumer change. As EV charging infrastructure is typically deployed within existing built-up areas, this is considered neutral to positive for the environmental objectives, with direct positive benefits for PHH and MA, and indirect positive benefits to CF/CCM/CCA and AQ as such infrastructure can facilitate positive modal transport shifts, in both public and private settings.

RES 13.3 A and C relate to transitioning to low-carbon fuels. As for RES objective 13.1, these are broadly positive across environmental objectives. **RES 13.3 B** supports measures for alternative fuels in transport. While this is broadly positive, depending on the source of renewable fuel utilised, there may be air emissions associated with this e.g. AD plant operation, which can also come with odour emissions which may be a nuisance for PHH. Provision of related infrastructure, such as refuelling stations indirectly encourages the use of alternative fuels. Thus the fuel source/feedstock, method of generation and resultant emissions must also be considered. For example, an increase in EV usage will result in an increase in the demand for electricity, which is also dependent on the method of electricity generation. There could be indirect effects on BFF, PHH, W, AQ and CF as a result of emissions to air where the source of the electricity is from e.g. peat/coal burning rather than renewable electricity sources.

Biofuels and biomethane are part of the solution but are also carbon-based, like fossil fuels, and combustion will result in some tailpipe emissions. As for RES 13.1, there can be expected overall improvements in ambient AQ from the transition to renewable transport options and alternative fuels. There may also be trade-offs in AQ, for instance CNG-fuelled cars when compared to diesel-fuelled vehicles emit lower amounts of NO_x and particulates, however emissions

Discussion

of carbon monoxide are higher. The amount of emissions will also vary depending on fuel quality combustion dynamics and engine age/type.

The use of biofuels is also a consideration in terms of LS, as unintended land use change may occur should biofuels become more widespread, with potential for impacts on LS, as well as BFF/W should habitats become fragmented/converted to fuel crop. When grassland is converted to arable/tillage to produce biocrops, some of the carbon stored in the soil is released into the atmosphere and the carbon sequestration potential of the soil is reduced. Conversion of land also has the potential to lead to soil erosion and run-off to watercourses if not managed sustainably. However it is acknowledged that the Indirect Land Use Change Directive (2015/1513) aims to restrict displacement of food crops for biocrops.

Proposed SEA Mitigation Measures:**General Mitigation**

This chapter should include reference to the *National Policy Framework on Alternative Fuels Infrastructure for Transport 2017-2030* which is noted to have undergone SEA and AA.

This has been included in supporting text

9.2.14 Chapter 14 – Waste Resources to Energy

Reference	Objectives
RES 14.1 Make a proportional contribution to national targets.	To maximise waste-to-energy use in the County in order to make a proportional contribution to meeting, or exceeding, national targets for renewable heat and transport of 24% and 10% respectively by 2030.
RES 14.2 Facilitating the development of Anaerobic Digestion facilities	To support and encourage the development of AD facilities: <ul style="list-style-type: none"> A. Where practical, adjacent to the national or regional road network and where traffic considerations are acceptable and the road network has adequate carrying capacity and in compliance with the provisions of the National Development Plan. A traffic management plan may be required. B. In a central location within the waste stream catchment area in order to minimise road hauls. C. Where there are no unacceptable effects on the amenities of existing residents. D. Proximate to electricity grid or gas network or large heat demand user.
RES 14.3 Small scale Anaerobic Digestion	To support and encourage in rural areas, proposals for small scale AD close to the source material and where roads have the capacity to carry increased traffic movements. Such facilities shall, where possible, be located within or adjacent to existing agricultural buildings, and in accordance with proper planning and sustainable development.
RES 14.4 AD and wastewater treatment	To investigate the feasibility of installing A.D. facilities at municipal wastewater treatment plants in the County. In addition to a feasibility study, an environmental appraisal of all potential impacts will be required for compliance with proper planning.
RES 14.5 Waste Energy Resource Utilisation	To investigate and identify any significant waste energy streams and to determine the feasibility of utilising such waste energy streams locally to increase energy efficiency in the County.
RES 14.6 Energy From Municipal Solid Waste	To support the Southern Region Waste Management Authority and the policies and objectives contained in any future Waste Management Plan and to investigate the feasibility of energy recovery associated with the processing of MSW subject to compliance with environmental legislation.
RES 14.7 Biogas potential	To identify opportunities for the production of biogas from various resources including biomass and waste resource streams including land fill gas in accordance with proper planning and sustainable development. To collaborate over the lifetime of the strategy with Gas Networks Ireland to establish injection points on the existing gas infrastructure pipeline to accommodate biomethane produced from renewable sources in County Clare.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 14.1	+	0	0	0	+/-	+	+	+	0	0	+
RES 14.2 A-D	+/-	0/-	0/+	0/-	+/-	+/-	+	+	0/-	0/-	+
RES 14.3	+/-	0/-	0	0/-	+/-	+	+	+	0/-	0/-	+
RES 14.4	+	0	0	0	+/-	+	+	+	0	0	+
RES 14.5	+	0	0	0	0	+	+	+	0	0	+
RES 14.6	+	0	0	0	0	+	+	+	0	0	+
RES 14.7	+/-	0	0	0	0/-	+	+	+	0	0	+

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AQ* – Air Quality; *CF* Climatic Factors; *CCM* – Climate Change Mitigation, *CCA* Climate Change Adaptation, *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

Discussion

RES 14.1 A is broadly positive as it supports the use of waste as a resource, which is in line with the Waste Hierarchy and can help close the loop and increase circularity. Therefore when applied over the medium to long terms, this would have direct positive impacts particularly for PHH, CF/CCM/CCA and MA, and will assist with the achievement of renewable energy targets. There can be impacts to AQ however from management of waste streams in terms of emissions to air and also exhaust emissions from the transportation of waste streams associated with heavy goods vehicles.

RES 14.2 A-D supports the development of anaerobic digestion (AD) facilities. Overall there are direct positive impacts for MA and CF in particular, and biological treatment overall is considered to have a positive impact across environmental objectives as it reduces the amount of waste requiring thermal treatment and/or disposal. In addition material recovery can result in a clean end product with low contamination levels, which can be reused in other applications e.g. as a soil conditioner. This objective is also reflective of circular economy principles.

It has been outlined within the objective the potential issues such as location in relation to waste stream, considerations of existing residents, the existing road network, close to the grid/gas network/heat demand user. Any proposed facility AD facilities would need to be developed in line with relevant environmental legislation. AD plants are also positive for PHH as there is potential for reduced energy costs as well as establishing security of supply; however there could be indirect operational nuisances such as noise and odour which could lead to temporary or persistent issues for PHH and AQ and may reduce quality of life for proximal communities. There are benefits in relation to a reduction in the consumption of fossil fuels and therefore CF/CCM/CCA and MA are both positive. As with any development there is the potential for negative impacts on the environment and in particular during the construction phase. It is noted that the objective has focused developers in relation to the siting of the facility to reduce issues in relation to road hauls.

RES 14.3 concerns small-scale AD facilities, which are broadly very positive as long as proper planning and relevant environmental regulations are adhered to. As with any development there is the potential for negative impacts on BFF, W, CH, LS and LandS, and there could be localised impacts from noise and/or odour from the facility as noted for RES 14.2.

RES 14.4 is looking at the feasibility of AD facilities being installed at waste and wastewater treatment plants. This would be a positive step towards energy recovery and reduction in GHGs. It would assist with contributing to achievement of renewable energy targets with subsequent benefits across environmental objectives, as this would utilise existing built infrastructure and could potentially reduce the area of any greenfield needed.

RES 14.5 relates to the feasibility of identifying significant waste energy streams, which will have generally long term direct positive impacts for PHH, CF/CCM/CCA and MA as this will assist with the achievement of renewable energy targets, as well as increasing the application of circularity principles in the county and moving even further away from disposal and toward recovery/ utilising waste as a resource.

RES 14.6 is positive for PHH, CF/CCM/CCA and MA in relation to supporting regional waste management planning. There are neutral impacts on the environment as this objective relates only to investigation of the feasibility of energy recovery in the county.

RES 14.7 relates to examining opportunities for producing biogas from various streams. Biogas is a high energy-containing gas produced from biological treatment of wastes (e.g. from composting and AD facilities). As such it can be used as a source of green energy production, and can also be used to offset some of the energy needed to operate a biological treatment plant. Supporting projects that look for opportunities for producing biogas from various streams will have positive impacts, particularly for MA and CF/CC. There may be some indirect negative effects on receptors such as AQ and PHH depending on the development e.g. from unwanted odours, if not managed appropriately. All such

Discussion

plants would however be subject to relevant EPA licensing requirements and associated limit values/ controls on emissions.

RES 14.7 also concerns collaboration efforts with Gas Networks Ireland to establish connection points. In terms of environmental objectives, this objective is broadly neutral as this would be a review exercise. In the longer term, it would be positive for MA as it would make use of existing infrastructure and allow greater penetration of biogas to the county (and national) network.

Proposed SEA Mitigation Measures:

General Mitigation

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed Amendment to Objective

- **RES 14.2:** The Planning Department assessing applications for AD plants should consider requesting traffic management plans.
A version of the mitigation has included reference to traffic management plans.
- **RES 14.6:** To support the Southern Region Waste Management **Plan Authority** and the policies and objectives contained in any future **Regional** Waste Management Plan and to investigate the feasibility of energy recovery associated with the processing of MSW subject to compliance with environmental legislation.
Proposed amendments have been incorporated.

9.2.15 Chapter 15 – Energy Storage

Reference	Objectives
RES 15.1 Facilitating energy storage systems	To facilitate, where possible, forms of Energy Storage, including pump hydro electric, battery and thermal energy storage and other forms of innovative energy storage that improves overall electricity grid resilience and stability. This includes facilities for green hydrogen production and storage.
RES 15.2 PHES Proposals	Within the Indicative Area identified on Map 15.1, to facilitate the development of Pumped Freshwater Hydroelectric Energy Storage, subject to satisfactory environmental protection.
RES 15.3 Sustainability of energy storage proposals	To examine at planning application stage how energy storage systems such as batteries will be safely managed and recycled at the end of life phase, to ensure that a circular economy approach to design and resource efficiency is followed.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 15.1	+/-	0/-	0/-	0/-	0/-	+	+	+	0/-	0/-	0/+
RES 15.2	+/-	0/-	0/-	0/-	0/-	+/-	+/-	+	0/-	0/-	0/+
RES 15.3	+	+	+	+	+	+	+	+	+	+	+

Key: **PHH** – Population and Human Health; **BFF** – Biodiversity, Flora and Fauna; **LS** – Soils and Geology; **W** – Water; **AQ** – Air Quality; **CF** Climatic Factors; **CCM** – Climate Change Mitigation; **CCA** Climate Change Adaptation; **MA** – Material Assets; **CH** – Cultural Heritage; **LandS** – Landscape.

Discussion

RES 15.1 The Draft RES does not provide details in relation to the other forms of Energy Storage and hence potential impacts on the environment are unknown. Negative impacts maybe encountered during the construction stage as with any form of development due to traffic and other construction related impacts (noise, dust). Similarly, AQ will also experience both positive due to use of cleaner technologies and short term negative impacts due to potential dust during construction. As with any commercial development potential negative impacts may also occur from loss of biodiversity, water pollution etc.

RES 15.2: The development of pumped hydroelectric energy storage (PHES) is positive in relation to MA and PHH through the provision of renewable energy and security of supply for the County. The first Clare RES 2017-2023 identified one indicative area (Slievecallan area), considered to have significant potential to accommodate future PHES

Discussion

following a detailed study of the geographical and physical potential and through the SEA/AA processes at the time. The remainder of the County is classified as not normally permissible for PHES.

There are potential negative impacts on environmental receptors including PHH and MA, as there could be displacement of settlements or increased traffic during construction. Any large scale development such as this could have impacts on the natural environment as outlined in **Table 9.1.2** and **Table 9.1.3** of this environmental report, including impacts to water courses via pollution, impacts to fish migration patterns, changes to hydromorphology, changes to hydrogeology, or changes to hydrology (including changes to flood patterns). The Slievecallan Mountain Bog NHA is noted to be within the indicative area outlined in the first RES, and there are potential Annex I habitats outside of protected sites; the EPA ESM Tool indicates a potential area of old oak woodland in the Magherabaun area. There are no European sites in proximity to the indicative area, but potential pathways/ hydrological/ hydrogeological considerations would need to be examined carefully as part of any development in this area (or elsewhere in the county); there are three freshwater pearl mussel catchments located to the south of the Slievecallan area (however these are noted to be catchments of 'other extant populations' rather than priority catchments).

A number of environmental protection policies have been outlined in Chapter 1 and Chapter 17 of the RES and summarised in **Chapter 10** of this SEA, which aim to ensure environmental assessments are undertaken for the protection of the natural environment from such large scale developments as PHES.

RES 15.3 is an overall positive objective in that it aims to protect the receiving environment through examining ways to ensuring energy storage systems are safely managed and recycled at the end of life phase.

Proposed SEA Mitigation Measures:

General Mitigation

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed Amendment to Objectives

- **RES 15.1:** To facilitate, where possible, forms of Energy Storage, including pump hydro-electric, battery and thermal energy storage and other forms of innovative energy storage that improves overall electricity grid resilience and stability. This includes facilities for green hydrogen production and storage **in line with national policy, proper planning and sustainable development.**
- **RES 15.2:** Within the Indicative Area identified on Map 15.1, to facilitate the development of Pumped Freshwater Hydroelectric Energy Storage, subject to satisfactory environmental protection and **in line with national policy, proper planning and sustainable development.**

Proposed New Objectives

- **Any development of PHES shall adhere to the overarching environmental objective RES 1.1.**
- **Any PHES development shall be subject to the appropriate hydrological, hydromorphological and environmental assessments as required. In addition, the cumulative effect of multiple hydro power developments shall be considered at earliest stage within planning and design process.**

9.2.16 Chapter 16 – Supporting Infrastructure

Reference	Objectives
RES 16.1 Renewable Energy and Supporting Infrastructure	<p>A. To collaborate with EirGrid over the lifetime of the Strategy to ensure that County Clare has the grid infrastructure in place to maximise its potential for renewable energy generation to meet its own energy needs and to enable export to the demand market</p> <p>B. To promote and as far as practicable facilitate EirGrid and ESB Networks in the development and delivery of a Smart Grid with its constituent elements.</p> <p>C. To support and facilitate the emergence of a competitive supply chain economy that will sustain and assist in further developing a robust renewable energy sector in County Clare.</p> <p>D. To request medium and large scale heat / energy users to utilise waste heat and power to meet on site energy requirements and to supply or utilise future district heating networks.</p> <p>E. To request that the expansion or upgrading of existing infrastructure, including roads, ports, piers, power lines and substations etc. to support the development of renewable energy projects.</p>

Reference	Objectives
	F. To ensure that the County's ICT and broadband network enables it to be a leader in renewable energy research and development
	G. To require planning applications for multi-unit housing developments, large commercial and industrial developments to be accompanied by a feasibility study setting out the potential for incorporating district heating infrastructure into the proposed development.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 16.1 A	0	0	0	0	0	0	0	0	0	0	+
RES 16.1 B	0	0	0	0	0	0	0	0	0	0	0
RES 16.1 C	0	0	0	0	0	+	+	+	0	0	+
RES 16.1 D	+	0	0	0	0	+	+	+	0	0	+
RES 16.1 E	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 16.1 F	+	0	0	0	0	+	+	+	0	0	+
RES 16.1 G	+	0	0	0	0	+	+	+	0	0	+

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AC* – Air Quality; *CF* Climatic Factors; *CCM* – Climate Change Mitigation; *CCA* Climate Change Adaptation; *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

Discussion

RES 16.1A Direct consultation with EirGrid is extremely important to ensure that the necessary infrastructure is in place in the county to maximise access to the grid and any potential exports. This objective is positive in relation to MA as existing infrastructure need protection and therefore Clare County Council need to be fully aware of the studies and projects that EirGrid are currently undertaking to ensure protection of existing infrastructure and development of the grid network.

RES 16.1B- The promotion of a smart grid will have a neutral impact on the SEOs.

RES 116.1C: There is potential that a competitive supply chain economy could lead to better prices for residents within County Clare.

RES 16.1 D: This objective will have positive impacts on C/A and MA1 and will help to meet the renewable energy targets for County Clare.

RES 16.1 E: The expansion or upgrading of infrastructure will be positive in relation to facilitating renewable energy development, however there is always potential for impact on the natural environment during the construction process and from long term permanent loss or impact. Whilst long-term positive impacts to humans is also predicted negative impacts may also occur during the construction stage due to increased traffic, noise etc. Negative impacts to landscape may also occur during the operation stage if expansions are inappropriately sited. Chapter 17 of the Draft RES includes measures for the protection of the environment.

RES 16.1F: This is positive in relation to population through the potential for employment in the research and development recommended by the objective. The facilitation of research is also positive for CF/CCM/CMA/MA.

RES 16.1G: The provision of district heating infrastructure could have positive impacts on residents if their heating bills were reduced. There are also positive impacts in relation to CF/CCM/CCA through reduction of fossil fuels as a heat source and for MA in relation to contributing towards renewable energy targets.

Proposed SEA Mitigation Measures:

General Mitigation

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed Amendment to Objective

Discussion

- **RES 16.1E:** *To facilitate the expansion or upgrading of existing infrastructure, including roads, ports, piers, power lines and substations etc. to support the development of renewable energy projects **in line with national policy, proper planning and sustainable development.***

9.2.17 Chapter 17 – Environmental Considerations & Development Management Advice

This section of the draft RES sets out the environmental considerations and development management advice as it relates to renewable energy technology in Clare.

Reference	Heading
17.2	Environmental Considerations
17.3	Development Management for Renewable Energy Developments
17.4	Implementing Renewable Energy through the Planning Process

Reference	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
17.2	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-
17.3	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-
17.4	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-

Key: PHH – Population and Human Health; BFF – Biodiversity, Flora and Fauna; LS – Soils and Geology; W – Water; AQ – Air Quality, CF Climatic Factors; CCM – Climate Change Mitigation, CCA Climate Change Adaptation, MA – Material Assets; CH – Cultural Heritage; LandS – Landscape.

Discussion

Section 17.2 sets out a number of environmental considerations which will need to be borne in mind when during all stages of development of RES which is considered positive. The section sets out the key environmental issues/impacts and some of the key constraints under the various environmental topic headings such as biodiversity, noise, landscape and visual etc. Notwithstanding the positive benefits across environmental receptors from RE development, these issues need to be considered in a wider environmental context, particularly in relation to cumulative effects, and in particular on those environmental receptors which have key interrelationships, such as BFF/W (and pathways for instance to European sites), LS/W/BFF (such as habitat fragmentation and landuse changes), PHH/AQ/CC (increasing the sustainable energy mix but potentially increasing air emissions e.g. from development, bioenergy etc.), PHH/MA (benefits to communities but increasing infrastructure footprint) etc.

A number of developments both in proximity and across the county can have effects on different receptors; landuse change will be an important indicator of the rate and scale of changes. As detailed in previous sections, the impacts and benefits are a mix between direct and indirect positive and negative impacts across receptors.

Section 17.3 outlines that development management advice is included within the draft CDP. With respect to the draft RES, this section summarises some of the key points when developers are considering RE development. As for Section 17.1, consideration of cumulative impacts will be important.

Section 17.4 highlights opportunities in the development management process for boosting the implementation of RE throughout the county. As for Sections 17.2 and 17.3, this section is broadly positive. A number of recommendations relate to encouraging RE installations such as solar panels, both domestically and at larger scales, as well as aspects related to retrofitting. As per the previous discussions on the various technologies, these are broadly positive across receptors, particularly PHH, MA and CC, however there is also potential for direct and indirect negative effects on environmental aspects e.g. retrofitting may impact on listed/protected structures, which may also impact on protected species e.g. bats. As set out in Section 17.2, early consideration of environmental issues at all planning stages is key.

Proposed SEA Mitigation Measures:**General Mitigation**

- **In order to avoid the potential for cumulative effects, the Planning Department assessing new applications should consider requesting traffic management plans which should include assessments of other nearby operations which should include assessments of other nearby operations.**

Discussion

- **Table 17.2 should include a new measure to require the planning Department assessing new applications for RE infrastructure to consider the cumulative effects of any planned or permitted developments in the county on the receiving environment.**
- **In order to avoid the potential for cumulative effects on the natural environment it is recommend that CCC monitor landuse change as a result of RE developments for the duration of the RES.**

9.2.18 Chapter 18 – Community Energy

Reference	Objectives
RES 18.1 Community engagement in community energy initiatives throughout County Clare	<p>A. To support the expansion of the SEAI Sustainable Energy Communities Programme within County Clare, growing from 20 SECs to 30 SECs</p> <p>B. To encourage community owned renewable energy projects across County Clare, availing of support available through SEAI to develop the concept and design, and availing of community RESS auction funding for project implementation</p> <p>C. To explore, in conjunction with Eirgrid, CRU and ESB Networks, whether grid capacity can be dedicated to community projects.</p>
RES 18.2 Community energy projects	<p>It is an objective of Clare County Council to encourage community energy projects in the following energy sectors:</p> <ul style="list-style-type: none"> • Anaerobic Digestion (A.D.)/ Biomethane plants, which can also help protect water resources in the county. • In the offshore and Shannon Estuary sectors, exploring community-related energy projects (tidal, wave, wind), possibly in partnership with neighbouring local authorities and communities. • In the West Clare Municipal District, to respond to the transition commencing at Moneypoint power station • Repurposing former landfill sites, as locations for community owned energy projects.
RES 18.3 Community Consultation for energy projects, and community gain	To encourage developers of proposed renewable energy projects to carry out community consultation in accordance with best practice and to commence the consultation at the start of project planning.
RES 18.4 Community Gain from Renewable Energy	To ensure that, wherever possible, community benefits are derived from all renewable energy development in County Clare. This will be through RESS community fund requirements, and also other voluntary approached where RESS requirements do not apply.

Objective	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA
RES 18.1 A	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 18.1 B	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 18.1 C	+	0	0	0	0	0	0	0	0	0	0
RES 18.2	+/-	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+
RES 18.3	+	0	0	0	0	0	0	0	0	0	0
RES 18.4	+	0	0	0	0	0	0	0	0	0	0

Key: **PHH** – Population and Human Health; **BFF** – Biodiversity, Flora and Fauna; **LS** – Soils and Geology; **W** – Water; **AQ** – Air Quality; **CF** Climatic Factors; **CCM** – Climate Change Mitigation, **CCA** Climate Change Adaptation, **MA** – Material Assets; **CH** – Cultural Heritage; **LandS** – Landscape.

Discussion

RES 18.1 A. This is largely an administrative objective but will result in benefits to local communities through ensuring a balance of demand and supply and provide the community with greater energy autonomy. Whilst overall considered a positive objective to PHH, CG, CCM, CCA and MA some indirect negative impacts may arise to the natural and built environment due to construction or inappropriate siting of infrastructure. Objectives set out in Chapter 1 and Chapter 17 of the RES and the CDP itself will offset any potential for significant environmental effects.

Discussion

RES 18.1 B and 18.2 are broadly similar and as with any form of infrastructural development, there is potential for negative impacts to BFF/W/LS/AQ/Lands and CH during the construction stage as set out in **Table 9.1.2** and **Table 9.1.3** above. Key issues are dependent on the type of RE proposed but could include potential displacement of agricultural land, loss of biodiversity, traffic and associated noise and dust, light and noise pollution during operation, seepage etc.

Increases in RE will have positive impacts on PHH, CF, CMM, CCA and MA through improved security of energy supply and reduction of GHG emissions. Negative impacts to PHH may also occur during the construction stage.

RES 18.1C: This objective is positive for local communities as it aims to provide grid connection to local communities.

RES 18.3: This objective is positive for local populations so that they can gain a detailed understanding of the proposed renewable energy project and how it would affect local residents. Developers should seek guidance from Clare County Council on the level of consultation required for specific renewable energy projects. It is also positive to see the requirement for early consultation forms part of the objective.

RES 18.4: As with objective **RES18.3** this objective will have positive impacts on human beings within County Clare. As there is no national guidance on community benefits, consultation on this matter is advised to be undertaken with Clare County Council.

Proposed SEA Mitigation Measures:

General Mitigation

As per **Chapter 3** - new objectives to be included in **Chapter 1**.

This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G

Proposed Amendment to Objective

- **RES 18.1 B:** To encourage community owned renewable energy projects across County Clare, availing of support available through SEAI to develop the concept and design, and availing of community RESS auction funding for project implementation **in line with national policy, proper planning and sustainable development.**

9.3 Cumulative Assessment

9.3.1 Introduction

The consideration of cumulative effects is a requirement of the SEA Directive (2001/42/EC). It states under Article 5(1) that an Environmental Report shall be prepared and relevant criteria is provided in Annex I, which states that: *"The likely significant effect (these effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects) on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors"*.

This section of the Environmental Report provides an outline of the potential cumulative effects on the environment as a result of draft RES.

9.3.2 Assessment Approach

Broadly speaking cumulative effects at the draft RES level can occur from two sources as follows:

- Interaction of measures within the draft RES; and
- Interaction from policies and proposals in other related plans, programmes and policies.

Interaction of Measures within the draft RES

The anticipated cumulative impacts associated with the policy objectives proposed in the draft RES are summarised below.

Population and Human Health: There is potential for overall positive cumulative effects to population from the various renewable energy technologies proposed within the RES which will cumulatively meet renewable targets, reduce GHG emissions and create employment opportunities. Cumulative negative impacts may also arise due to increase traffic associated with the construction stage from the various technologies proposed should they occur in the same area at a similar time.

During the operation stage feedstocks for both AD & CHP facilities may for the most part come from rural and agricultural areas; potentially resulting in higher traffic volumes in rural areas with increase in travel towards centralised areas of heat demand, and could cause light and noise pollution due to potential 24 operations. The cumulative impact of higher traffic volumes, potential light and noise pollution may have an impact on population.

Similarly brownfield sites considered desirable for the development of bioenergy and large scale solar facilities may result in cumulative impacts to PHH during the construction stage due to increased traffic and/or noise or dust pollution during the construction stage.

General Mitigation

In order to avoid the potential for cumulative effects the Planning Department assessing new applications should consider requesting traffic management plans which should include assessments of other nearby operations.

Biodiversity Flora and Fauna: There are broadly potential negative cumulative impacts for BFF associated with the various objectives proposed to facilitate renewables. The key impacts relate to land use change (particularly loss of greenfield), habitat loss/ fragmentation, loss of or disturbance to species, and spread of invasive species, marine habitat disturbance and disruption of migration patterns. Notwithstanding this the overall objective of the RES to reduce GHG emissions will have positive impacts with regards to climate change and the long-term (albeit small) protection of biodiversity from effects of global warming.

General Mitigation

In order to avoid the potential for cumulative effects on the natural environmental is recommend that CCC monitor landuse change as a result of RE developments for the duration of the RES.

Cultural Heritage and Landscape: The objectives proposed in the draft RES could have a cumulative negative impact on both cultural heritage and landscape as a result of new infrastructure and increased marine activity including transmission cables, offshore windfarms. At local planning level, sensitive site optioneering and consideration of the wider environment prior to the siting of any new RE infrastructure will greatly reduce any potential cumulative impacts.

Land, Soil and Water: There is potential for cumulative impacts as a result of objective which include ongoing use of brownfield sites for new RE. Activities associated with the development of brownfield sites including potential disturbing contaminated soil could result in mobilisation of pollutants and indirect impacts to water quality. Development of land for energy crops could have a cumulative negative effect on landuse if not monitored.

In addition as with all infrastructure the potential cumulative impacts associated with the construction phase could result in impacts to water through deterioration of water quality, disturbance to aquatic species and migrating patterns of marine life if not managed and planned in a sustainable manner.

Air Quality and Climatic Factors: Objectives relating to continued uptake of renewable energy from various technologies generally have positive cumulative impacts for AQ and CF, CCM and CCA as renewable energy provides a cleaner alternative to conventional generation in terms of reduced impact on air quality and climate and result in reducing GHG emissions. Whilst potential negative cumulative effects could occur during the construction and decommissioning stages it is considered that sufficient mitigation is in place in **Chapter 17** of RES and in the CDP to avoid the potential for significant cumulative negative effects.

The RES objectives are anticipated to lead to improved awareness of renewable energy technologies and energy efficiency, as well as reducing CHG emissions, thereby allowing for overall improvement to climate.

Material Assets: potential for positive cumulative effects to arise from the combined objectives in the RES as a result in a reduction in GHG emissions and creation of employment opportunities across the various re technologies and sources.

Interaction from Policies and Proposals in Other Related Plans

There are a number of key national, regional and county policies which have the potential to result in cumulative positive impacts on the receiving environment. Climate with the RES. The most noteworthy of

these are policies relating to our renewable targets set by the Climate Action Plan which is realised through the NPF and the RSES and in turn the Clare CDP and the draft RES which will result in positive cumulative impacts to CF, CCM, CMA, MA, AQ and PHH by reducing GHG emissions, creating cleaner air quality through reduced burning of fossil fuels, providing a self-sufficient energy supply and creating employment opportunities.

Another key interaction is with land use planning, namely the National Planning Framework, the RSES and the Clare CDP. Directed by the national target, the RSES have specified targets for brownfield and infill development within existing built-up areas, in order to contribute to better compact growth and offset urban sprawl while the RES has also specified use of brownfield sites for solar development.

While this is overall positive in terms of avoiding greenfield development, given the historical and previous industrial uses in uses many built up areas, there is potential for these national and regional targets alongside the objectives in the RES to lead to the generation of significant volumes of contaminated land/soil. Any contaminated material would need to be appropriately managed and treated, and as such there is potential for long-term cumulative negative effects on receptors such as LS, BFF, W and MA in particular, as well as AQ and CF as some contaminated material would need to be exported for treatment.

Chapter 6 outlines other plans and programmes with relevance to the draft RES and which could have a cumulative impacts with the objectives and actions proposed.

General Mitigation

Table 17.1 should include a new measure to require the Planning Department assessing new applications for RE infrastructure to consider the cumulative effects of any planned or permitted developments in the county on the receiving environment.

10 MITIGATION AND MONITORING

10.1 Summary of Mitigation Measures

The Environmental Report has highlighted the more significant potential positive and negative environmental impacts from the implementation of the draft RES (including cumulative impacts). It has also had regard to the assessment work carried out to inform the Appropriate Assessment of the draft RES. The mitigation measures, presented in **Table 10.1.1** have been identified to reduce the negative impacts identified. It is intended that this mitigation will be integrated into the various relevant Chapters of the Draft RES.

Table 10.1.1: Proposed SEA and NIR Mitigation Measures

Reference	Mitigation
Chapter 1 - Introduction	See mitigation proposed under Chapter 3 following the assessment of the Chapter 3 objective.
Chapter 2 – Legislation and Policy Context	No objectives included – N/A
Chapter 3 – Energy Profile of County Clare	<p><i>[Note – SEA mitigation is outlined in green, NIR mitigation in red. Where mitigation has been incorporated into the draft RES, this has been noted in highlight]</i></p> <p><u>General Mitigation – Proposed New Objectives to be included in Chapter 1</u></p> <ul style="list-style-type: none"> Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029. <i>Mitigation has been incorporated into the Chapter as Objective RES 1.1 A</i> The EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool should be applied to inform decision-making in terms of infrastructural/siting considerations as well as consideration of environmental sensitivities. <i>Mitigation has been incorporated into the Chapter as Objective RES 1.1 B</i> To ensure that RE development proposals support and enhance the connectivity and integrity of habitats in the RES area by incorporating natural features into the design of development proposals; and to work with infrastructure providers to co-develop infrastructural management plans to enhance biodiversity. <i>Mitigation has been incorporated into the Chapter as Objective RES 1.1 C</i> <p><u>Proposed NIR Mitigation</u></p> <ul style="list-style-type: none"> To require any Renewable Energy project to be in compliance with the objectives and requirements of the Habitats Directive, specifically Article 6(3) and where necessary 6(4), Birds, Water Framework (including the implementation of the 3rd Cycle RBMP), and all other relevant EU Directives and all relevant transposing national legislation. <i>Mitigation has been incorporated into the Chapter as Objective RES 1.1 D</i> To require project planning for any Renewable Energy project to be fully informed by ecological and environmental constraints at the earliest stage of project development and any necessary assessment to be undertaken, including assessments of disturbance to species and habitats, as required. Any ecological assessment shall also be required to consider ecological connectivity and potential supporting habitats to European Sites. <i>Mitigation has been incorporated into the Chapter as Objective RES 1.1 E</i> To require the preparation and assessment of all planning applications for Renewable Energy projects to have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report, SEA Environmental Report and Strategic Flood Risk Assessment Report of the County Clare CDP 2021- 2028 Development Plan and SEA of the Renewable Energy Strategy. <i>Mitigation has been incorporated into the Chapter as Objective RES 1.1 F</i>

Reference	Mitigation
	<ul style="list-style-type: none"> Ensure that no RE projects are permitted that give rise to significant cumulative, direct, indirect or secondary impacts on the integrity of European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects, (either individually or in combination with other plans, programmes, etc. or projects) (Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be: a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place). <p>Mitigation has been incorporated into the Chapter as Objective RES 1.1 G</p>
Chapter 4 – Summary of Renewable Potential, Resources and Targets	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p>
Chapter 5 – Energy Conservation and Efficiency	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendments to Objectives</p> <ul style="list-style-type: none"> RES 5.1 A: To contribute towards the EU wide target of achieving at least 32.5 % improvement in energy efficiency <i>in line with national policy, proper planning and sustainable development.</i> RES 5.1 F: To encourage a high standard of sustainable energy efficiency and conservation in the existing building stock by encouraging developers, owners, and occupiers to improve the environmental performance of buildings and to promote the uptake in incentives, schemes, grants or other available funding to improve energy efficiency <i>in line with national policy, proper planning and sustainable development.</i> RES 5.1 G(b): Promoting retrofitting of existing buildings to achieve a high level of energy conservation, energy efficiency and use of renewable energy sources <i>in line with national policy, proper planning and sustainable development.</i> RES 5.1 G(h): To identify significant 'waste' energy sources in County Clare and to promote and facilitate the capture and conversion of such energy to a usable resource for local consumption <i>in line with national policy, proper planning and sustainable development.</i>
Chapter 6 – Onshore Wind	No objectives included – N/A
Chapter 7 – Solar	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed New Objective</p> <p>It is an objective to undertake a feasibility study/strategy in relation to solar farm development within County Clare. The study would outline all of the potential environmental and technical (grid connection) constraints and/or opportunities associated with solar development at the identified sites allowing CCC to plan ahead to ensure planned development of solar infrastructure across the county and avoiding potential for cumulative environmental impacts on landscape, landuse etc. and allowing for proper planning and sustainable development.</p> <p>Proposed Amendments to Objectives</p> <ul style="list-style-type: none"> RES 7.1: Increase the penetration of commercial scale solar energy projects <i>in line with national policy, proper planning and sustainable development.</i> RES 7.2: Promote integration of solar energy <i>in line with national policy, proper planning and sustainable development.</i>
Chapter 8 – Bio-energy	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>All general mitigation measures have been included in draft RES Chapter 1 as part of RES 1.1</p>

Reference	Mitigation
	<p>Proposed New Objectives</p> <p>Suggest adding new objectives as follows:</p> <ul style="list-style-type: none"> To support initiatives for energy research funding and to encourage the development of bioenergy opportunities, facilities and associated rural enterprises in the countryside in appropriate locations where such activities do not have a significant negative impact on the environment and where they assist in the diversification away from fossil fuels to green energy. Mitigation has been incorporated into the RES 8.1 objective as RES 8.1 C Planning applications for biomass crops such as willow or miscanthus will consider potential environmental effects in relation to land use changes and in particular will assess potential for likely significant effects on European sites and other environmental sensitivities as identified by the EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool. Sustainable best practice in the growing of biomass and in the associated forestry management shall be required: <ul style="list-style-type: none"> The planning of biomass will be in accordance with the following guidance: Miscanthus Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011); and Short Rotation Coppice Willow Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011) Mitigation has been incorporated into the RES 8.1 objective as RES 8.1 D It is an objective to monitor any land use change due to biomass/energy crops to ensure avoidance of impacts to the receiving environment including biodiversity and agriculture. Mitigation has been incorporated as new objective RES 8.6 <p>Proposed Amendment to Objective</p> <ul style="list-style-type: none"> RES 8.4 B: <i>To promote the installation of district heating schemes in line with national policy, proper planning and sustainable development.</i>
Chapter 9 – Marine Renewables	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed New Objective</p> <ul style="list-style-type: none"> To undertake a feasibility study of infrastructure (port, onshore grid, landfill locations etc) in relation to any new port development. The study would outline all of the potential environmental and technical (grid, depth of water) constraints and/or opportunities associated with port development at the identified sites allowing CCC to plan ahead to enable/facilitate offshore energy in line with national policy, proper planning and sustainable development. <p>Proposed Amendments to Objectives</p> <ul style="list-style-type: none"> RES 9.1 A, RES 9.2 B and C should also include the following at the end of the Objective: ...and in line with national policy, proper planning and sustainable development. RES 9.3 A should be amended to state: To work in partnership with the marine renewable energy sector (wave, tidal and offshore), DECC, EirGrid and other relevant stakeholders to deliver the key actions recommended by the Ocean Renewable Energy Development Plan (OREDPA) and DS3 Programme, ensuring that electricity generated off the coast of County Clare can be exported to the demand market subject to the requirements of all environmental legislation and in accordance with the OREDPA SEA Environmental Report and the Natura Impact Report. Mitigation has been incorporated as part of the objective.
Chapter 10 – Microgeneration	<p>General Mitigation:</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed New Objective</p>

Reference	Mitigation
	<ul style="list-style-type: none"> To require all planning applications for new buildings in the residential, industrial, commercial and agricultural sectors throughout County Clare to demonstrate how the energy needs of the proposed development can be provided for with indigenous renewable energy resources, harnessed by incorporating micro renewable technologies, as an important element in establishing a low carbon County and assisting in meeting assigned renewable energy targets. Mitigation has been incorporated as new objective RES 10.2 C All planning applications must be accompanied by an environmental appraisal outlining the potential impacts and required mitigation measures to reduce impacts on the natural environment and any potential impacts on architecture.
Chapter 11 – Micro Hydroelectric Power	<p>General Mitigation As per Chapter 3 - new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objective</p> <ul style="list-style-type: none"> RES 11.1: To facilitate the development of micro hydro power developments on a case by case basis, where proposals comply with requirements of the Habitats Directive, Birds Directive, the relevant River Basin District Management Plan, the provisions of the Clare County Development Plan 2023 - 2028, with the 'Guidelines on the Planning, Design, Construction and Operation of small scale hydro electric schemes and Fisheries' (DCENR and Inland Fisheries Ireland) and other related legislation/ guidance that is available, in accordance with proper planning and sustainable development. Proposed amendments have been incorporated. <p>Proposed New Objectives</p> <ul style="list-style-type: none"> An Ecological Impact Assessment should identify all ecological factors, including ecological corridors, be accompanied by appropriate surveys, undertaken at the correct time of year and be undertaken by a suitability qualified and experienced ecologists. Details of the habitats impacted by the MHP will be required, including descriptions of protected species recorded and mapping of habitat locations and extents. The habitat mapping should be in accordance with best practice guidance. A version of the mitigation has been incorporated as part of RES 11.2 There are a number of plant species protected under the Flora Protection Order, 1999, which may potentially occur in some of the identified areas. Also, there are breeding sites and resting places of otter, and potentially of bats, (both of which are strictly protected under S.I. No. 477 of 2011, as amended), within the MHP areas this will require both survey for these and to comply with the Wildlife Acts and Regulations. A version of the mitigation has been incorporated as part of RES 11.2 Development of MHP must be undertaken in a sustainable manner with regard to the fisheries resources within the river. Developments of MHP must ensure that they do not impede the ability for fish to migrate upstream. Should a weir be required to be constructed in order to manage the flow to the turbine, a fish pass will be required to be integrated to ensure that there is an attractive upstream path for the fish. Each fish pass will be required to be designated in accordance with the fish species contained within the relevant river. All fish passes should be agreed with IFI. A version of the mitigation has been incorporated as part of RES 11.2 Consultation will be required with the IFI in relation to the development of any of the MHP sites identified in this strategy. Mitigation has been incorporated as part of RES 11.2 A full archaeological, architectural and/or landscape assessment may be required in relation to any proposed application in relation to MHP. Mitigation has been incorporated as part of RES 11.2 Any micro hydro development shall adhere to the overarching environmental objective RES 1.1.

Reference	Mitigation
	<ul style="list-style-type: none"> Any micro hydro power development shall be subject to the appropriate hydrological, hydromorphological and environmental assessments as required. In addition, the cumulative effect of multiple hydro power developments shall be considered at earliest stage within planning and design process.
Chapter 12 – Renewable Heat	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>As biomass is currently the dominant fuel source for RES-H, planning applications for biomass crops would need to consider potential environmental effects in relation to land use changes and in particular will assess potential effects European sites, NHAs and pNHAs.</p> <p>Proposed Amendment to Objective</p> <p>RES 12.4 A: To protect wells, aquifers and other water courses in the development of shallow geothermal resources in accordance with the National River Basin Management for Ireland 2018-2021 2022-2027 and otherwise in accordance with the requirements of the Water Framework Directive, the Habitats Directive and Birds Directive.</p> <p>Proposed amendments have been incorporated.</p>
Chapter 13 – Renewable Transport	<p>General Mitigation</p> <p>This chapter should include reference to the <i>National Policy Framework on Alternative Fuels Infrastructure for Transport 2017-2030</i> which is noted to have undergone SEA and AA.</p> <p>This has been included in supporting text.</p>
Chapter 14 – Waste Resources to Energy	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objective</p> <ul style="list-style-type: none"> RES 14.2: The Planning Department assessing applications for AD plants should consider requesting traffic management plans. A version of the mitigation has included reference to traffic management plans. RES 14.6: To support the Southern Region Waste Management Plan Authority and the policies and objectives contained in any future Regional Waste Management Plan and to investigate the feasibility of energy recovery associated with the processing of MSW subject to compliance with environmental legislation. Proposed amendments have been incorporated.
Chapter 15 – Energy Storage	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objectives</p> <ul style="list-style-type: none"> RES 15.1: To facilitate, where possible, forms of Energy Storage, including pump hydro-electric, battery and thermal energy storage and other forms of innovative energy storage that improves overall electricity grid resilience and stability. This includes facilities for green hydrogen production and storage in line with national policy, proper planning and sustainable development. RES 15.2: Within the Indicative Area identified on Map 15.1, to facilitate the development of Pumped Freshwater Hydroelectric Energy Storage, subject to satisfactory environmental protection and in line with national policy, proper planning and sustainable development. <p>Proposed New Objectives</p> <ul style="list-style-type: none"> Any development of PHES shall adhere to the overarching environmental objective RES 1.1. Any PHES development shall be subject to the appropriate hydrological, hydromorphological and environmental assessments as required. In addition,

Reference	Mitigation
	the cumulative effect of multiple hydro power developments shall be considered at earliest stage within planning and design process.
Chapter 16 – Supporting Infrastructure	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objective</p> <p>RES 16.1E: To facilitate the expansion or upgrading of existing infrastructure, including roads, ports, piers, power lines and substations etc. to support the development of renewable energy projects <i>in line with national policy, proper planning and sustainable development.</i></p>
Chapter 17 – Environmental Considerations & Development Management Advice	<p>General Mitigation</p> <ul style="list-style-type: none"> In order to avoid the potential for cumulative effects, the Planning Department assessing new applications should consider requesting traffic management plans which should include assessments of other nearby operations. In order to avoid the potential for cumulative effects on the natural environment it is recommend that CCC monitor landuse change as a result of RE developments for the duration of the RES. Table 17.2 should include a new measure to require the planning Department assessing new applications for RE infrastructure to consider the cumulative effects of any planned or permitted developments in the county on the receiving environment.
Chapter 18 – Community Energy	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objective</p> <p>RES 18.1 B: To encourage community owned renewable energy projects across County Clare, availing of support available through SEAI to develop the concept and design, and availing of community RESS auction funding for project implementation <i>in line with national policy, proper planning and sustainable development.</i></p>
Cumulative Effects	<p>General Mitigation</p> <ul style="list-style-type: none"> In order to avoid the potential for cumulative effects the Planning Department assessing new applications should consider requesting traffic management plans which should include assessments of other nearby operations. In order to avoid the potential for cumulative effects on the natural environment is recommend that CCC monitor landuse change as a result of RE developments for the duration of the RES. Table 17.1 should include a new measure to require the Planning Department assessing new applications for RE infrastructure to consider the cumulative effects of any planned or permitted developments in the county on the receiving environment.

10.2 Monitoring

Article 10 of the SEA Directive requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of the draft RES, with the view to taking remedial action where adverse effects are identified through monitoring. A monitoring programme is developed based on the indicators, which enable positive and negative impacts on the environment to be measured. The environmental indicators of relevance to the draft RES were identified from the SEA process. These are intended to be used to show changes that would, as far as possible, be attributable to implementation of the draft RES.

10.2.1 Sources of Information for Monitoring

Monitoring has focused on the aspects of the environment that are likely to be significantly impacted by the draft RES. Where possible, indicators have been chosen based on the availability of the necessary information and the degree to which the data will allow the target to be linked directly with the implementation of the draft RES. The monitoring proposed for the RES also aims to tie-in to the monitoring within the CDP. **Table 10.2.1** presents the Environmental Monitoring Programme to track progress towards achieving SEOs and reaching targets and includes sources of relevant information.

It is the responsibility of CCC to coordinate the monitoring of their CDP and RES, however it is acknowledged that CCC will, to a large extent, rely on existing monitoring programmes managed by, for instance, other relevant departments/ sections within the local authority itself, as well as other agencies (e.g. EPA). It remains the responsibility of CCC to liaise with data holders to get the data and to report on the monitoring of the CDP and RES.

It is acknowledged that remediation of any unforeseen effects is likely to require a more integrated response across authorities, agencies and departments and to fully establish the correct response/actions should such effects be identified.

10.2.2 Monitoring Programme

The following targets and indicators outlined in **Table 10.2.1** are suggested for monitoring of the CDP and incorporating consideration of RES issues. It is noted that this is a proposed monitoring programme which will be finalised post-consultation and as such all suggestions are welcome. It is intended that this monitoring will be integrated into the final RES.

Table 10.2.1: Proposed Environmental Monitoring Programme

Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
Climate Change Mitigation Measures				
CC1 – Reduce the need to travel/increased use of public transportation and achieve modal shift in transport across the county.	An increase in the percentage of the population travelling to work, school or college by public transport or sustainable modes of transport (walking, cycling). Decrease in proportion of journeys made by private fossil fuel-based car compared to 2016 National Travel Survey levels	See C2 for more details % Increase in the number of people reporting regular cycling/walking to school and work above 2016 CSO figures. Consultations with Department of Communication Climate Action and Environment. CSO data.	TBC	CCC Forward Planning section review of CSO figures in relation to car journeys and mode of transport
CC2 – Decrease the usage of fossil fuels and increase both renewable resource usage and protection together with a move towards more low carbon energy sources.	For review of progress on implementing Plan objectives to demonstrate successful implementation of climate reduction targets as provided for by Plan provisions including those provided for and referenced in Chapter 1 “Climate Action” Increase in the proportion of people resident in the County reporting regular cycling / walking to school and work above 2016 CSO figures Decrease in the proportion of journeys made by residents of the County using private fossil fuel-based car compared to 2016 levels Contribute towards transition to a competitive, low-carbon,	Implementation of Plan measures relating to climate reduction targets as provided for by Plan provisions including those provided for and referenced/discussed in Chapter 1 of the CDP “Climate Action” Proportion of journeys made by private fossil fuel-based car compared to 2016 levels. Proportion of people reporting regular cycling / walking to school and work above 2016 CSO figures	TBC	CCC Forward Planning section in conjunction with the Climate Action Regional Office, Limerick Clare energy Agency - annual

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	<p>climate-resilient and environmentally sustainable economy by 2050</p> <p>Contribute towards the target of the Renewable Energy Directive (2009/28/EC), for all Member States to reach a 10% share of renewable energy in transport by 2020</p> <p>Contribute towards the target of aggregate reduction in carbon dioxide (CO₂) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors</p> <p>To promote reduced energy consumption and support the uptake of renewable options and a move away from solid fuels for residential heating.</p>			
CC3 – Integrate Climate Change mitigation measures into every fabric of spatial planning through the restriction of inappropriate development/land-use zoning in flood risk zones, inclusion of green infrastructure as the status quo and the incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all developments	TBC	TBC	TBC	TBC
CC4 – Maintain and protect our natural carbon sinks (bogs/marshes/forests/fens)	No loss of wetlands, bogs, fens, marshes, or other carbon sinks across the	Change in landuse across the county	TBC	Clare County Council Forward Planning and Development Management sections co-ordinated through the SEA Officer in terms of

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
as decarbonising areas which can serve a dual purpose in terms of enhancement of biodiversity and mitigation against Climate Change.	county through reclamation, infilling or development.	Protection of key areas of flood plains and associated wetland features Reclamation/Infilling of bogs, fens and other wetland habitats.		planning applications granted across these habitats
Climate Change Adaptation Measures				
CC5 – Encourage and support the utilisation of energy-efficient and water-efficient building design to better equip homes and businesses to cope during times of shortage and service interruption, such as grey-water recycling, the use of solar PVs, passive houses etc.	To minimise emissions of greenhouse gasses. Integrate sustainable design solutions into the County's infrastructure (e.g. energy efficient buildings; green infrastructure). Contribute towards the reduction of greenhouse gas emissions in line with national targets. Promote development resilient to the effects of climate change. Promote the use of renewable energy, energy efficient development and increased use of public transport	Implementation of Plan measures relating to climate reduction targets as provided for by Plan provisions including those provided for and referenced in Chapter 1 "Climate Action". No. of applications for retrofitting of buildings with energy efficient equipment. No. of applications for SEAI deep retrofit grant. No. of application with climate adaptation measures incorporated e.g. SuDs, Nature Based Solutions, solar panels etc.	TBC	Clare County Council Forward Planning and Development Management sections co-ordinated through the SEA Officer in terms of planning applications granted for retrofits and/or including climate adaptation measures. LCEA/SEAI in relation to SEAI deep retrofit grant applications.
CC6 – Encourage the retrofitting of buildings with a particular focus on the existing council housing stock ensuring a Just Transition for all.	Contribute towards the reduction of greenhouse gas emissions in line with national targets.	No. of applications for retrofitting of buildings with energy efficient equipment.	TBC	Clare County Council Forward Planning and Development Management sections co-ordinated through the SEA Officer in terms of planning applications granted for retrofits of existing council housing stock.
CC7 – In preparing the spatial plan for our county that we develop ecologically resilient and	% Increase in the extent and preservation of ecological networks and stepping-stones zoned as part of the	Extent/Quantity of riparian buffer zones, open space and green infrastructure zoned as part of our County Development Plan.	Where encroachment is occurring within these	Clare County Council Forward Planning and Development Management sections co-ordinated through the SEA Officer.

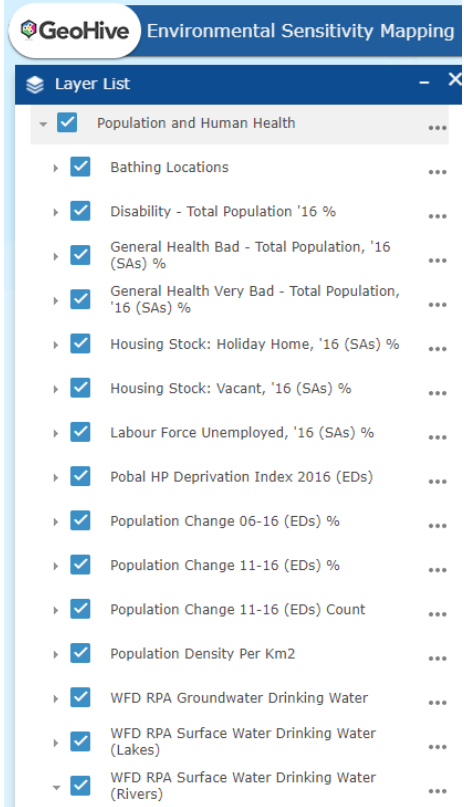
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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
varied landscapes through the establishment and preservation of ecological networks and stepping-stones as part of our settlement zonings and objectives and foster adaptive management practices in the face of uncertainty, favouring flexible adaptation options and allowing for alterations of the Plan as monitoring and evaluation data become available during its implementation.	County Development Plan and within the Settlement Strategies.		areas, ensure enforcement action is taken to reinstate habitat and associated zoning.	
Population, Human Health and Quality of Life				
P1 – Protect, enhance and improve people's quality of life based on high quality residential, community, educational, working and recreational environments and on sustainable travel patterns.	<p>Increase in the number of green spaces and amenities available to the public.</p> <p>Improved access to community and recreational facilities</p> <p>No significant deterioration in human health as a result of environmental factors.</p> <p>Provide opportunities or measures for the population</p>	<p>No/area of green spaces and amenities available to the public. No of Green Infrastructure Plans/strategies prepared in line with CDP Objective 15.13.</p> <p>Sustainable densities achieved in new residential/mixed use schemes which also achieve high standards of design and which respect the surrounding landscape.</p> <p>No of applications/Percentage increase in the number of schools, creches, community parks, sports facilities and primary health care centres.</p> <p>Availability of public transport/ smarter travel initiatives.</p>	<p>Review CDP zoning to assess preservation of amenity/ green space</p> <p>If negative trends are identified, CCC will develop a tailored response to address issues/</p>	<p>Clare County Council Forward Planning Team.</p> <p>Clare County Council Development Management.</p> <p>Clare County Council Development Management.</p> <p>Iarnród Éireann - Annual Bus Éireann – Annual Clare County Council Municipal District Offices</p> <p>EPA State of the Environment Report</p>

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	to access and use renewable energy resources.	<p>Occurrence of any decline in human health around the plan area.</p> <p>See Air and Climate and Transport Targets and indicators below.</p>	bottlenecks in the planning process	<p>Deterioration in Air Pollutants Monitored in the National Ambient Air Quality Monitoring Network</p> <p>Utilisation of the data contained in the EPAA's Environmental Sensitivity Mapping tool under the Population and Human Health category to identify any key areas of deterioration since the adoption of the Plan.</p> <p>The SEA Officer within the council should undertake a baseline mapping/reporting exercise upon adoption of the Plan as a record of the current status which can be used to monitor the changes against.</p>

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
				 <p>The screenshot shows the 'GeoHive Environmental Sensitivity Mapping' interface. It features a 'Layer List' on the right side with a list of 18 layers, each with a checkbox and a three-dot menu. The layers are: Population and Human Health, Bathing Locations, Disability - Total Population '16 %, General Health Bad - Total Population, '16 (SAs) %, General Health Very Bad - Total Population, '16 (SAs) %, Housing Stock: Holiday Home, '16 (SAs) %, Housing Stock: Vacant, '16 (SAs) %, Labour Force Unemployed, '16 (SAs) %, Pobal HP Deprivation Index 2016 (EDs), Population Change 06-16 (EDs) %, Population Change 11-16 (EDs) %, Population Change 11-16 (EDs) Count, Population Density Per Km2, WFD RPA Groundwater Drinking Water, WFD RPA Surface Water Drinking Water (Lakes), and WFD RPA Surface Water Drinking Water (Rivers).</p>
P2 – Protect Human Health	Compliance with air quality legislation in particular around the town of Ennis.	<p>Number of exceedances of air quality limits.</p> <p>Number of Enforcement Actions taken due to breaches by retailers/distributors and the public Under the Air Pollution Act (Marketing, Sale, Distribution and Burning of Specified Fuels) Regulations 2012.</p>	Review awareness campaigns/initiatives in relation to air quality issues to improve knowledge and awareness.	EPA Air Quality Monitoring Annual Report (nearest stations applicable to Ennis) (yearly reporting)

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
Biodiversity, Flora and Fauna				
B1 – Protect, conserve, enhance where possible and avoid loss of diversity and integrity of the broad range of habitats, species, wildlife corridors, ecosystems and geological features.	<p>Reduction in length or loss of hedgerows.</p> <p>No. ecological networks or parts thereof which provide significant connectivity between areas of local biodiversity to be lost without remediation as a result of implementation of the Clare County Development Plan 2023 – 2029.</p> <p>Stable or increasing number of bat roosts within the county.</p> <p>Status of the Cloon Freshwater Pearl Mussel catchment.</p>	<p>No. of developments granted planning permission within designated sites</p> <p>No. of Natura Impact Statements submitted to Clare County Council. Where mitigation is proposed to offset loss or to promote enhancement monitoring should be undertaken to assess the achievement or otherwise of the measures.</p> <p>No/% increase/decrease in bat roosts within the county.</p> <p>No. of objectives/policy actions delivered by the biodiversity plan.</p> <p>Status of Cloon freshwater pearl mussel catchment.</p>	<p>Where condition of European sites is found to be deteriorating this will be investigated with reference to the NPWS to establish if the pressures are related to CDP actions/activities. A tailored response will be developed in consultation with relevant stakeholders.</p>	<p>Forward Planning/Development Management through the SEA Officer.</p> <p>Utilisation of GIS data sets and consultation with NPWS to establish changes since the adoption of the Plan.</p>
B2 – To achieve the conservation objectives of European Sites (SACs and SPAs) and other sites of nature conservation.	<p>No loss of protected habitats and species during the lifetime of the Plan.</p> <p>No compromise in the favourable conservation condition of European sites.</p> <p>No compromise or impact on the achievement of the favourable conservation condition objectives (whether maintain or restore) of European sites.</p>	<p>No./percentage of developments in/near the Natura 2000 network.</p> <p>Percentage of European sites in the plan area that are at 'Favourable' conservation status.</p> <p>Percentage of Qualifying Interest Features which have achieved their specific objectives of maintain or restore.</p>	<p>As for B1</p>	<p>Using GIS query the European sites dataset as provided by the NPWS against planning applications received for the No./% applied for within these areas and the No./% refused/granted.</p> <p>Review the conservation status of the European Sites in Clare against the status as documented in the preparation of the CDP.</p> <p>Where permissions have been granted and/or developments have taken place within European sites are the Qualifying Interest Features achieving their specific objectives.</p>

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
				Responsibility; Forward Planning, Development Management, SEA Officer.
B3 - Conserve and protect other sites of nature conservation including NHAs, pNHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries as well as protected species outside these areas as covered by the Wildlife Act.	<p>No loss of protected habitats & species during the lifetime of the Plan.</p> <p>Submission of Screening Report or Natura Impact Statement for proposed developments with planning applications in/and/or near European Sites.</p>	<p>Percentage of unique habitats and species lost in designated sites through trending of annual surveys.</p> <p>Provision/No. of Screening Reports/Natura Impact Statements with developments proposed for sites in/and/or near European sites.</p>	TBC	<p>Forward Planning/Development Management through the SEA Officer should assess planning applications within these sites to establish if there has been a percentage loss of protected habitats and/or species.</p> <p>Site visits may be required to ground truth the GIS analysis.</p>
B4 - Meet the requirements of the Water Framework Directive and the River Basin Management Plan.	<p>All waters within the plan area to achieve the requirements of the WFD and the relevant River Basin Management Plan by 2027.</p> <p>Ensure provision of riparian zones at project/site level.</p>	<p>No. of surface and groundwater bodies achieving "Good Status". No of waterbodies indicating deterioration in status.</p> <p>No. of planning applications with sufficient inclusion of buffer zones and Sustainable urban Drainage Systems (SuDS) where necessary and applicable (in both urban and rural settings).</p>	TBC	<p>Forward Planning and Development Management. SEA Officer to compare WFD status results to the baseline as used in the preparation of the CDP 2023-2029.</p> <p>Utilise EPA WFD Application and Catchments.ie for CCC-specific information on the significant threats and pressures impacting WFD status and Risk.</p>
B5 – To minimise and, where possible, eliminate threats to biodiversity including invasive species.	<p>Prevent the introduction of new invasive or alien species.</p> <p>Control/manage new invasive species.</p> <p>Control/manage/eradicate invasive species throughout the county.</p>	<p>No., type and location of invasive species identified.</p> <p>No. of actions achieved under the Biodiversity Action Plan.</p> <p>Increase/decrease in coverage of invasive species identified through the Municipal Districts of Ennis, Killaloe, Shannon and West Clare. Each MD have a programme of invasive species eradication underway in September and October with funding from the National Parks and Wildlife Service (Dept. Housing, Local Government &</p>	TBC	SEA Officer in conjunction with the Heritage Officer in conjunction with the Municipal District Offices on a yearly basis.

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
		<p>Heritage), National Biodiversity Action Plan Funding 2021.</p> <p>Follow up work will involve further mapping of the problem species, Knotweed and Giant Hogweed in particular and proposed long term management and control measures.</p> <p>No. of submissions/observations submitted through invasive species Ireland "Alien Watch". www.invasivespeciesireland.com/alien-watch</p> <p>No. of Planning Applications which are accompanied by an Alien/Invasive Species Report and/or requested through the Planning Department to prepare an Alien/Invasive Species Management Plan.</p> <p>The National Biodiversity Data Centre will track success in the implementation of the All-Ireland Pollinator Plan by measuring increases in the abundance and diversity of pollinators within the Irish landscape as the 81 actions are implemented.</p>		
B6 - Promote green infrastructure networks, including riparian zones and wildlife corridors.	Ensure new development is set back from rivers in line with the zoning for Open Space and Buffer Zones within the County Development Plan. .	No. planning permissions granted within these zoned areas.	Review CDP zoning to assess preservation of amenity/ green space	Forward Planning and Development Management co-ordinated by the SEA Officer. Run GIS process/analysis to select areas zoned as Open Space/Buffer space against mapped planning files to establish if there has been a loss in the protection of these critical habitats and ecosystems and their associated species and services they provide.
Soil and Geology				

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
S1 – To maximise the sustainable re-use of the existing built environment, derelict, disused and infill sites (brownfield sites), rather than greenfield sites.	<p>Preference for development on brownfield site over green field.</p> <p>Specified % of new applications granted to be on brownfield sites.</p> <p>Limited and controlled development of greenfield sites.</p> <p>Re-use of soil from redeveloped sites where possible.</p> <p>No incidences of soil contamination.</p>	<p>No/% of new developments on brownfield sites.</p> <p>Area of brownfield land developed over the plan period.</p> <p>% of total greenfield land developed.</p> <p>% landcover in comparison with 2018 Corine figures.</p> <p>Level of urbanisation.</p> <p>Excessive land-filling of quality soil.</p> <p>Incidences of soil contamination.</p> <p>Volume of contaminated material generated in comparison with previous years' figures.</p>	<p>Where the proportion of growth on infill and brownfield sites is not keeping pace with the targets set in the NPF and the RSES, the Council will liaise with the Regional Assembly to establish reasons and coordinate actions to address constraints to doing so.</p> <p>Review of local authority applications for legacy landfill remediation authorisation. Where progress is stalled, CCC to work with the EPA to identify any</p>	<p>Forward Planning and Development Management co-ordinated by the SEA Officer.</p> <p>Annual through a review of planning applications utilising GIS.</p> <p>CCC Environmental Section in conjunction with the EPA</p>

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
			bottlenecks in the process.	
S2 – Minimise the excavation and movement of soils within site works.	Limited and controlled development of greenfield sites. Limit the amount of excavation in sensitive locations for example peat excavation in wind farm sites.	Volume of construction and demolition waste recycled. No. of brownfield sites that have been redeveloped.	TBC	Forward Planning and Development Management co-ordinated by the SEA Officer.
S3 – Minimise the consumption of non-renewable deposits on site.	Re-use of soils from redeveloped sites where possible. Increased provision of construction and demolition waste facilities. Ensure sustainable extraction of non-renewable sand, gravel and rock deposits and the reuse and recycling of construction and demolition waste.	Excessive land-filling of quality soils. No. of facilities for Construction and Demolition Waste.	TBC	Forward Planning and Development Management co-ordinated by the SEA Officer. Review of number of applications associated with infilling of lands to establish source of waste.
Water				
W1 – Implement appropriate Sustainable urban Drainage Systems (SuDS) in the County with a focus on Nature Based Solutions.	New drainage systems to be compliant with SuDs.	No. of developments granted planning permission that incorporate SuDs. No of innovative Nature Based Solutions incorporated into developer or council related projects.	TBC	Forward Planning/Development Management coordinated through the SEA Officer – Quarterly planning permissions granted.

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W2 – Reduce the impact of polluting substances to all waters and prevent pollution and contamination of ground water by adhering to aquifer protection plans and to maintain and improve the quality of drinking water supplies.	Improvement or at least no deterioration in surface and groundwaters by 2027.	Changes in receiving waters and groundwater quality as identified by water quality monitoring programmes conducted by CCC and EPA.	TBC	Environment section of Clare County Council co-ordinated through SEA Officer in conjunction with a review of the baseline surface and ground water quality as outlined in the Clare County Development Plan 2023-2029.
W3 - Promote sustainable water use and water conservation in the plan area and to maintain and improve the quality of drinking water supplies.	Pressure on water and wastewater treatment plants.	Decrease in no. of water shortage notices issued during drought periods. Decrease in the amount of water consumed per household in the plan area.	Where negative trends are identified, CCC to review awareness campaigns/ initiatives in relation to water management issues to improve knowledge and awareness.	Clare County Council/Irish Water Review response to awareness campaigns ran by the Environment section of Clare County Council.
W4 – Protect flood plains and areas of flood risk from development through avoidance, mitigation and adaptation measures.	In accordance with OPW/DoEHLG, all planning applications within designated Flood Risk Zones A and B as identified in the Strategic Flood Risk Assessment for the Plan are required to undertake Site Specific Flood Risk Assessment.	Level and location of flooding. Unzoned lands directly adjacent to areas known to be prone to flooding. Where new areas become at risk from flooding due to climate change, further areas may be required for climate adaptation.	Review CDP zoning and associated landuse in areas of land directly adjacent to flood prone areas and amend as new	CCC – Records obtained as and when flood events occur. CCC – Clare County Council Forward Planning and Development Management sections co-ordinated through the SEA Officer. OPW – As updated on www.floodinfo.ie Forward Planning – SEA Officer to map flood events since the publication of the County Development Plan against planning

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	No zoning directly adjacent to known flood risk areas.		information arises.	permissions granted to assess if development has taken place within a flood plain, areas prone to flooding or as a result of climate change in areas which have now become prone to flood and therefore may merit a change to zoning within the County Development Plan as a result of monitoring.
W5 – To promote a responsible attitude to recreation and amenity use of water in relation to water quality and disturbance to species and to prevent pollution and contamination of designated bathing waters.	Maintain water quality, no pollution or contamination issues in our rivers and lakes in particular but also our estuaries and all waters designated as bathing waters.	Adherence to bathing water guidance and standards in accordance with the bathing water Directive and associated Regulation (S.I. No. 79 of 2008).	Where negative trends/ deterioration in bathing quality is identified, CCC with work with the EPA to identify key pressures and develop a tailored response to reduce/ eliminate the sources of pollution.	Retention or approval for Blue Flag status - The Blue Flag is operated in Ireland by An Taisce-The National Trust for Ireland on behalf of the Foundation for Environmental Education (FEE) – Annually Progression of bathing waters from 'sufficient' to 'good' to 'excellent' with no waters categorised as 'poor' in accordance with the water quality standards specified in the 2008 Regulations with a classification of at least 'sufficient' to be achieved for all bathing waters. No of beach closures by Clare CoCo across the county due to a deterioration in water Quality.
Air and Climate Change				
C1 – Minimise all forms of air pollution and maintain/improve ambient air quality.	Maintain ambient air quality through reduction of private vehicle usage. Increase the production of energy from renewable energy resources.	Air quality indicators. No of/usage of EV Charge points Number of Electric Vehicles registered in the county. % Compliance with EPA emission limits for sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and fine particulate matter	Where targets are not achieved, the Council will liaise with the Regional Assembly, the EPA and the Climate Action Regional	Forward Planning, Development Management coordinated through the SEA Officer with respect to the no of EV charge points associated with granted developments. EPA – Air Quality Index for Health (AQIH)

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	Increase the number of air monitoring stations in the County	<p>Number of new air monitoring stations in the County.</p> <p>Monitor the trends in air quality indicators NOx to ensure move to EV is showing a positive trend.</p> <p>Monitor the trends in air quality indicator Particulate matter to ensure move to CHP is not causing negative impacts.</p>	<p>Office to establish reasons and develop solutions.</p> <p>Where proportion of population shows increase in private car use above the latest CSO figures, the Council will coordinate with the Regional Assembly, the DHLGH, DECC and NTA to develop a tailored response.</p>	
C2 – Minimise emissions of greenhouse gases and contribute to a reduction and avoidance of human-induced global climate change.	<p>Provide for increased use of public transport.</p> <p>Increase number of cycle lanes and pedestrian routes in the plan area.</p> <p>Establish incentives/increase no. of permissions for renewable energy projects.</p> <p>Reduction of private vehicle usage compared to 2016 Census levels.</p>	<p>% compliance with EPA emission limits for sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and fine particulate matter.</p> <p>% decrease in the number of journeys made by private fossil-fuel based car compared to 2016 CSO figures.</p> <p>% increase in the number of people reporting regular cycling/walking to school and work above 2016 CSO figures.</p> <p>No. of new rural bus services or routes.</p>	As above for C1	<p>CCC – Annual as new cycle strategy and/or Green Infrastructure is published.</p> <p>CSO – Annual as figures/reports based on 2022 census become available.</p> <p>CCC – No. and type of planning applications in relation to low carbon residential housing and wind turbines and/or commencement of construction of such on an annual basis.</p>

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	<p>An increase in the percentage of the population travelling to work or school by public transport or non-mechanical means.</p> <p>Establishment of a decarbonising zone within the county.</p> <p>Achieve transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050.</p> <p>Contribute towards EU GHG emission targets and aggregate reduction in carbon dioxide (CO₂) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors.</p> <p>Increase the production of energy from renewable energy resources</p>	<p>No. of buildings (public or private) with BER rating of B or more as a % of overall building stock.</p> <p>No of Decarbonization zones Identified and Implementation plan complete</p> <p>Number of Electric Vehicles registered in the county and No. EV Charge points in the county</p> <p>Use of public transport.</p> <p>Provision of cycle lanes and walking routes.</p> <p>No. of grants given for insulation works; energy efficiency of new buildings – energy rating figures.</p> <p>No. of planning applications for residential houses with low carbon footprint.</p> <p>No. Of wind turbines permitted which may contribute to mitigation of, and adaptation to Climate Change.</p> <p>Location of permitted wind farms within areas of the greatest wind energy resource in County Clare as depicted through the SEAI Wind Atlas. http://maps.seai.ie/wind/</p> <p>No. of planning applications for renewable energy.</p> <p>No of IPC licences relating to renewable energy.</p> <p>Quantity of energy being sold to the Grid in County Clare.</p>		<p>CCC Forward Planning section review of CSO figures in relation to car journeys and mode of transport</p> <p>CCC review of SEAI figures.</p> <p>CCC Forward Planning, Environmental section, Limerick Clare Energy Agency and Climate Action Regional Office.</p>
Material Assets – Transport				

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
T1 – Maximise sustainable modes of transport and encourage use of walkways/cycle paths as alternative routes to school, work, and shops.	<p>An increase in provision of cycle lanes and pedestrian routes.</p> <p>An increase in population travelling to work and school by public transport or non-motorised transport.</p> <p>A reduction in the distance travelled to work or school by the population of the plan area.</p>	<p>No. of cycle lanes and pedestrian routes provided in the plan area.</p> <p>Percentage of the population within the plan area travelling to work or school by public transport or non-mechanical means.</p> <p>Average distance travelled to work or school by the population of the plan area.</p> <p>Number of private cars on road as a percentage of Annual Average Daily Traffic (AADT).</p>	See C1 and C2 above	<p>CCC – Achievement of Clare County Council Active Travel under the Departments Smarter Travel Scheme annually.</p> <p>CSO – every 6 years through census information.</p> <p>NRA</p>
T2 - Provide for ease of movement for all road users and to promote development patterns that protect and enhance road safety.	<p>Reduce the number of private vehicles on the road.</p> <p>Increase in public transport.</p> <p>Increase cycle and walking modes of transport.</p> <p>Integrated traffic management plan for the plan area.</p>	<p>No. of private cars on the road as a percentage of AADT.</p> <p>No. of applications for the Bike to Work Scheme.</p> <p>Traffic survey and pedestrian surveys undertaken in the preparation of a traffic management plan.</p>	Where a static or downward trend in sustainable modal uptake is identified, review LA awareness campaigns/ initiatives to Improve knowledge and awareness.	CCC - ongoing
Material Assets – Waste				
WA1 – Implement the waste pyramid and encourage reuse/recycling of material wherever possible.	<p>Reduction in the quantities of waste sent to landfill.</p> <p>Increase in the quantities of waste sent for recycling.</p> <p>Increase in the number of bring banks in the plan area.</p>	<p>Quantity/% of household waste sent to landfill when compared with 2022 figures.</p> <p>% of waste used for energy production when compared with 2022 figures.</p>	Where negative trends are identified, CCC to review awareness campaigns/	<p>CCC – Environment Department, Limerick Clare Energy Agency and Forward Planning statistics and reports.</p> <p>Southern Waste Region – Annually through Statistical Indicators Report and Waste Management Plan Annual Report</p>

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	Compliance with the Southern Region Waste Management Plan	<p>%/ Volume of construction and demolition waste recycled.</p> <p>Quantity/ % of household waste sent to recycling when compared to 2022 figures.</p> <p>The number of bring banks provided for in the plan area.</p> <p>Compliance with the Southern Region Waste Management Plan.</p>	initiatives in relation to waste management issues to improve knowledge and awareness.	
Material Assets – Water Supply				
WS1 - To ensure adequate and clean drinking water supplies.	Upgrade existing water treatment plants within the plan area.	<p>Number of upgrades undertaken within the plan area.</p> <p>Number of households served by public water supplies.</p>	TBC	<p>Irish Water – Achievement of Water Services Strategic Plan objectives</p> <p>Irish Water – The implementation of the Lead Mitigation Plan over the lifetime of the County Development Plan to achieve safe, clean drinking water for all.</p> <p>Irish Water – The implementation of the National Water Resources Plan to balance the supply and demand.</p> <p>The implementation and/or achievement of these Plans can be monitored by the Forward Planning Team in consultation with water services in Clare County and Irish Water.</p>
WS2 - Improve efficiency in distribution of potable water to the population through pipe rehabilitation and to promote water conservation and sustainable water usage for long-term protection of available water resources.	<p>Reduce the amount of water usage.</p> <p>Reduce the amount of water lost through pipe leakage (currently 65%) through the pipe rehabilitation.</p>	<p>Water meter readings (Reintroduction of water charges based on conservation).</p> <p>Sale of water harvesting butts.</p> <p>Retrofitting of rainwater harvesting units.</p>	TBC	<p>Irish Water – reduction in household costs for water charges based on conservation (This is dependent on water charges being reintroduced; meter readings are still on-going in the absence of charges)</p> <p>Irish Water – The implementation of the Lead Mitigation Plan over the lifetime of the County Development Plan to achieve safe, clean drinking water for all.</p>

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	Increase usage of water collected through water harvesting.			Replacement of Asbestos piping across the county. CCC Forward Planning in conjunction with Water Services and Irish Water.
Material Assets – Wastewater				
WW1 - To ensure that all zoned lands (existing and proposed) are connected to the public sewer network ensuring treatment of wastewater which meets EU requirements prior to discharge.	Upgrade existing wastewater treatment plant infrastructure identified within the plan as being insufficient, based on existing and forecasted population demands to meet EU requirements.	Upgraded Wastewater Treatment Plants within the plan area. Number of plants exceeding the Emission Limit Values (ELVs) for Wastewater Treatment Discharge licence set by the EPA.	Where planning applications in the settlement strategy are rejected due to insufficient capacity in the Wastewater treatment Plant (WwTP) or failure of the WwTP to meet Emission Limit Values (ELV), CCC will work with the Regional Assembly, EPA and Irish Water to coordinate a response to achieve the necessary capacity.	Irish Water -Achievement of Water Services Strategic Plan objectives. CCC Forward Planning Team – granting of permission conditioned based on a future WWTP upgrade. CCC Forward Planning Team – refusal of permission as no upgrade to WWTP due to take place or due to insufficient capacity in the WWTP or failure of the WWTP to meet Emission Limit Values.

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
WW2 - Reduce the dependency on individual proprietary wastewater treatment facilities and ensure the highest standards possible in existing and future wastewater treatment facilities.	Testing of individual proprietary wastewater treatment facilities in line with EU/National guidance. Sustainable alternative individual proprietary WWT facilities. Measures to promote encourage and incentivise a change from traditional WWTS to alternative sustainable systems.	No. planning applications for single houses within the plan area, served by individual WWT facility. Testing of individual WWT facilities. Types/usage/percentage using sustainable methods of WWT.	TBC	CCC – Forward Planning Team – No. of applications which are approved and contain alternatives to on-site systems such as wetland systems.
Material Assets – Renewable Energy				
RE1 - Reduce waste of energy, promote use of renewable energy sources and support energy conservation initiatives across all sectors including the development of low carbon business practices and buildings.	Increase in renewable energy developments. Achieve transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050. Contribute towards EU GHG emission targets and aggregate reduction in carbon dioxide (CO2) emissions of at least 80% (compared to 1990 levels) by 2050 across the electricity generation, built environment and transport sectors.	No. of renewable energy developments granted planning permission. Establishment of R&D projects (one or more). Meet or exceed County contributions to national renewable energy targets. Meet or exceed County contributions to national energy efficiency/conservation targets. In line with the Wind Energy Strategy (Volume 5 of the Development Plan) achieve the minimum target of 550MW from wind energy by 2017. The number of hectares of land that has been converted to use for Bio energy production utilising Miscanthus; Oilseed Rape; Reed Canary Grass or SRC Willow. (Suitable lands have been identified through the SEAI Bioenergy Map http://maps.seai.ie/bioenergy/).	Where targets are not achieved, CCC will liaise with the Regional Assembly, the EPA and the Climate Action Regional Office to establish reasons and develop solutions. Where proportion of population shows increase in private car use above the	CCC – Forward Planning Team – No. of renewable energy applications which are approved– new solar farms, windfarms (onshore and offshore) or other renewable energy developments granted. LCEA, Clare CoCo, SIFP – number of new R&D projects within the Plan area e.g., testing of tidal energy devices. Southern Regional Assembly. % Landcover in comparison with 2018 Corine figures.

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	<p>Ensure that waste arising from renewable energy facilities are recycled where possible.</p> <p>Implement the Council's Climate Change Adaption Strategy 2019-2024</p> <p>Achieve Targets set out in the RES</p>	<p>No. of planning applications for renewable energy.</p> <p>No. of IPC licences relating to renewable energy.</p> <p>Quantity of energy being sold to the Grid in County Clare.</p> <p>Increase in volumes of non-recyclable waste from renewable facilities.</p> <p>Tracking the change of energy and fuel mix at household level</p> <p>Targets in RES - Consents, MW delivered, consented.</p> <p>No of communities designated as 'Sustainable Energy Communities'</p> <p>As per C1 and C2 above.</p>	<p>most recent CSO figures, the Council will coordinate with the Regional Assembly, the DHLGH, DECC and NTA to develop a tailored response</p>	<p>Annual monitoring and updating of the Council's Climate Change Adaption Strategy 2019-2024 with a review and revision every five years / Planning Consent and Design Standards / Monitoring and updating of Ennis 2040 and key aims.</p> <p>SEAI Data, Limerick Clare Energy Agency Data, CARO office.</p>
Cultural Heritage				
<p>CH1 – Protect and conserve the cultural heritage including the built environment and settings; archaeological (recorded and unrecorded monuments), architectural (Protected Structures, Architectural Conservation Areas, vernacular buildings, materials and urban fabric) and manmade landscape features (e.g. field walls, footpaths, gate piers etc.).</p>	<p>No permitted development which involves loss of cultural heritage, including protected structures, archaeological sites, Architectural Conservations Areas and landscape features.</p>	<p>No. of developments permitted during the lifetime of the plan which will result in the loss or partial loss of protected structures or sites of archaeological status.</p> <p>No. of additions to the list of Protected Structures.</p> <p>No. of additions to the list of Architectural Conservation Areas.</p> <p>Development of cultural heritage areas for amenity resources.</p>	<p>TBC</p>	<p>Forward Planning and Development Management sections of Clare County Council through the SEA Officer.</p>

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
CH2 – To protect, conserve and enhance local folklore, traditions and placenames within the Plan area.	To increase the use of local placenames within the plan area.	No. Of applications which are referred to the Conservation and Heritage Officers.	TBC	Forward Planning and Development Management sections of Clare County Council through the SEA Officer.
CH3 – To ensure the restoration and re-use of existing uninhabited and derelict structures where possible opposed to demolition and new build (to promote sustainability and reduce landfill).	To increase the number of uninhabited and derelict structures that are restored opposed to demolition.	No. planning applications for restoration/re-use of vacant and derelict structures. No. planning applications for demolition and redevelopment of vacant and derelict sites.	TBC	Forward Planning and Development Management sections of Clare County Council through the SEA Officer.
Landscape				
L1 – Conserve, protect and enhance valued natural, cultural and built landscapes, views of local value and features including those of geological and aesthetic value.	Ensure no significant disruption of historic/ cultural landscapes and features through objectives of the County Development Plan.	No. of developments permitted and their impacts on cultural/historic landscapes. No. of developments located within Scenic Route or no degradation of areas designated as Heritage Landscapes (Locations in text and on maps). No. of developments located within a designated scenic view or route or high landscape area in County Clare that disrupt views (based on the LCA). Development and application of framework in relation to the application of LCA and their contribution to SEA.	TBC	Forward Planning and Development Management sections of Clare County Council through the SEA Officer. Undertake a GIS analysis of the various landscape types across the county to establish the no of developments permitted within these designations and whether they are since perceived to be causing an impact.
L2 - Maintain and enhance landscape quality within the plan area by minimising visual impacts through appropriate design, assessment and siting.	No significant visual impact from development. Ensure no significant disruption of high landscape values. No damage to designated landscapes or seascapes as	No. of developments located within a high landscape area that disrupt views (based on LCA): Loss of vistas/views. Loss of trees. Loss of amenity woodland. No. of large scale developments permitted.	TBC	Forward Planning and development Management in conjunction with the SEA Officer. GIS analysis to establish if any developments have taken place within a high landscape area and if so the degree to which it is affected.

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Strategic Environmental Objective	Target	Indicator/Data Sources	Remedial Action	Source/Responsibility/Frequency
	a result of the Renewable Energy Strategy.	The number of renewable energy facilities sited in landscapes/ seascapes with a high sensitivity to change.		

11 NEXT STEPS

11.1 Introduction

There is still some important work to be done before the Renewable Energy Strategy can be adopted. The next step in the SEA and SEA process will be a public consultation period. During this time, comments on the findings of the Environmental Report, the Natura Impact Report, and the content of the draft RES may be submitted for consideration. **Table 11.1.1** outlines the remaining steps in this process.

Table 11.1.1: Remaining Steps in the Draft RES, SEA and AA Processes

Renewable Energy Strategy	Strategic Environmental Assessment and Appropriate Assessment
Publication of draft RES	Publication of Environmental Report and Natura Impact Report
End of statutory consultation	End of statutory consultation. Review of submissions and preparation of SEA Statement
Review of submissions and amendments to the draft RES	Review of submissions and preparation of SEA Statement
Adoption of the draft RES	March 2023
Publication of final RES	Publication of SEA Statement – April 2023

Written submission or observation on the draft RES or associated environmental reports can be made, preferably in 'word' format, to one of the following media:

Email: devplan@clarecoco.ie

Mail: Clare Renewable Energy Strategy (SEA Consultation),
Planning Department,
Clare County Council,
Áras Contae on Chláir,
New Road,
Ennis,
County Clare.
V95 DXP2

The final date for responses in respect of this consultation is **4pm on 28th March 2022**.

These submissions/ observations will be taken into consideration before finalisation of the draft RES. Early responses would be appreciated to allow more time to clarify and resolve issues that may arise. It should be noted that in the interests of transparency, all submissions received may be published on CCC website and subject to Freedom of Information.

Appendix A

Relevant Plans & Programmes for the Draft Clare RES

Note: This is not intended to be an inventory of all environmental legislation, plans, programmes or policies. Rather it is a consideration of the objectives of key texts which are relevant to the draft RES and supplements **Chapter 6** of the SEA Environmental Report.

Review of International Level Plans, Programmes and Policies

Topic	Title	Summary of Objectives: International
Biodiversity	UN Convention on Biological Diversity (1992)	<p>The Convention on Biological Diversity (CBD), known informally as the Biodiversity Convention, is a multilateral treaty. The Convention has three main goals:</p> <ul style="list-style-type: none"> • Conservation of biological diversity (or biodiversity); • Sustainable use of its components; and • Fair and equitable sharing of benefits arising from genetic resources. <p>In other words, its objective is to develop national strategies for the conservation and sustainable use of biological diversity. It is often seen as the key document regarding sustainable development. The Convention was opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993.</p>
	Ramsar Convention on Wetlands of International Importance (1971 and amendments)	Objectives include protection and conservation of wetlands, particularly those of importance to waterfowl as Waterfowl Habitat.
	The Convention for the Protection of the marine Environment of the North-East Atlantic (OSPAR) (1992)	Objectives include international cooperation on the protection of the marine environment of the north-east Atlantic.
	Bern Convention (Convention on European Wildlife and Natural Habitats) 1982	The Bern Convention is a binding international legal instrument in the field of nature conservation, covering most of the natural heritage of the European continent and extending to some States of Africa.
Waste	Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) 1983	<p>The Bonn Convention focuses on preserving the habitats used by migratory species and aims to enhance the conservation of terrestrial, marine and avian species on a global scale throughout their range. Key actions/ provisions under the Convention include:</p> <ul style="list-style-type: none"> • Establishment of a legal foundation for internationally coordinated conservation measures throughout a migratory range; • Migratory species threatened with extinction are listed on Appendix I of the Convention. CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them; and • In Europe, legislation to ensure that the provisions of the Bonn Convention are applied includes the Birds Directive and the Habitats Directive.
	Basal Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	The Basel Convention regulates the transboundary movements of hazardous wastes and other wastes and obliges its parties to ensure that such wastes are managed and disposed of in an environmentally sound manner.

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Topic	Title	Summary of Objectives: International
Climate Change	Paris Agreement (UNFCCC, 2015)	<p>The Paris Agreement and the outcomes of the UN climate conference (COP21) cover all the crucial areas identified as essential for a landmark conclusion:</p> <ul style="list-style-type: none"> • Mitigation – reducing emissions fast enough to achieve the temperature goal; • A transparency system and global stock-take – accounting for climate action; • Adaptation – strengthening ability of countries to deal with climate impacts; • Loss and damage – strengthening ability to recover from climate impacts; and • Support – including finance, for nations to build clean, resilient futures.
	DOHA Climate Gateway (2012)	A UN climate change conference in Doha, Qatar, concluded in December 2012 with a new agreement called the “Doha Climate Gateway.” Its major achievements included the extension until 2020 of the 1997 Kyoto Protocol on reducing greenhouse gas emissions, as well as a work plan for negotiating a new global climate pact by 2015, to be implemented starting in 2020.
	Cancun Agreements (2010)	The Cancun Agreements are a set of significant decisions by the international community to address the long-term challenge of climate change collectively and comprehensively over time and to take concrete action now to speed up the global response. The agreements, reached on December 11 in Cancun, Mexico, at the 2010 United Nations Climate Change Conference represent key steps forward in capturing plans to reduce greenhouse gas emissions and to help developing nations protect themselves from climate impacts and build their own sustainable futures.
	Bali Road Map (2007)	The Bali Climate Change Conference in 2007 produced the Bali Road Map, which comprised a number of decisions to present various tracks essential to reaching a secure climate future.
	UN Kyoto Protocol, The United Nations Framework Convention on Climate Change (UNFCCC, 1997)	The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty negotiated at the Earth Summit in Rio de Janeiro from 3 to 14 June 1992, then entered into force on 21 March 1994. The UNFCCC objective is to “stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”. The framework set no binding limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the framework outlines how specific international treaties (called “protocols” or “Agreements”) may be negotiated to set binding limits on greenhouse gases.
Sustainability	UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) 1991	This convention entered into force in 1997. It sets out the obligations of parties to carry out, at an early stage, an EIA of certain activities. It sets out the general obligation of States to notify and consult with each other on major projects that are likely to have a significant adverse environmental impact across boundaries.
	United Nations Sustainable Development Goals	The United Nations Sustainable Development Goals (SDGs) frame national agendas and policies to 2030. The SDGs build on the UN Millennium Development Goals and have a broader agenda that applies to all countries.
Cultural Heritage	World Heritage Convention United Nations Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)	Objectives seek to ensure the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage and ensure that effective and active measures are taken for these.

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) ENVIRONMENTAL REPORT (ER)

Topic	Title	Summary of Objectives: International
Human Health/ Air Quality	Stockholm Convention on Persistent Organic Pollutants (POPs) (2004)	Global treaty with the objective of seeking to protect human health and the environment from persistent organic pollutants (POPs).
	World Health Organisation (WHO) Air Quality Guidelines (1999) and Guidelines for Europe (1987)	Objectives seek the elimination or minimisation of certain airborne pollutants for the protection of human health.
	The Gothenburg Protocol (1999)	The 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone (known as the Multi-effect Protocol or the Gothenburg Protocol) is a multi-pollutant protocol designed to reduce acidification, eutrophication and ground-level ozone by setting emissions ceilings for sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia to be met by 2010. As of August 2014, the Protocol had been ratified by 26 parties, which includes 25 states and the European Union.
	Minamata Convention on Mercury (2017)	Global treaty with the objective of protecting human health and the environment from the adverse effects of mercury.
	The 1979 Geneva Convention on Long-range Transboundary Air Pollution (LRTAP)	The LRTAP was the first international legally binding instrument to deal with problems of air pollution on a broad regional basis. It was signed in 1979 and entered into force in 1983. It has since been extended by eight specific protocols. The Convention is one of the central means for protecting our environment. It has substantially contributed to the development of international environmental law and has created the essential framework for controlling and reducing the damage to human health and the environment caused by transboundary air pollution. It is a successful example of what can be achieved through intergovernmental cooperation.
	UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) (1998)	The Aarhus Convention has the objective of guaranteeing the rights of access to information (first pillar), public participation in decision-making (PPDM) (second pillar), and access to justice (third pillar) in environmental matters in order to contribute to the protection of the right of every person of present and future generations to live in an environment adequate to his or her health and well-being.

Review of European Level Plans, Programmes and Policies

Topic	Title	Summary of Objectives: European
Biodiversity	EU Biodiversity Strategy to 2030	The biodiversity strategy aims to put Europe's biodiversity on the path to recovery by 2030 for the benefit of people, climate and the planet. In the context of the post-COVID-19 pandemic, it aims to build resilience to future threats, including climate change, security of food supplies, forest fires, outbreaks of disease and combating the illegal trade in wildlife. It aims to increase the Natura 2000 network, and will launch an EU restoration plan by the end of 2021. To enable implementation, it also aims to allow better tracking of progress, improving knowledge transfer and emphasising 'respect for nature' in decision making (public and business).
	EC 8 th Environmental Action Programme (EAP) to 2030	In October 2020, the EC published a proposal for the 8th EAP. Its aim would be to support and build on the environmental aspects of the Green Deal to 2050. Its six priority objectives are to:

Topic	Title	Summary of Objectives: European
		<ul style="list-style-type: none"> • Achieve greenhouse gas reduction targets and for the EU to be climate neutral by 2050. • Enhance adaptiveness and increase resiliency to the effects of climate change. • To decouple economic growth from resource use and therefore degradation of the environment, while transitioning to a circular economy. • Aiming for a zero-pollution environment and to protect the health and wellbeing of all Europeans. • Restoring biodiversity and enhancing natural capital/ecosystems. • To reduce pressures on the environment and the climate from consumption/production, namely industry, energy, buildings, infrastructure, mobility and food systems.
	EU 7 th Environmental Action Programme to 2020	<p>Objectives seek to make the future development of the EU more sustainable. It identifies three key objectives:</p> <ul style="list-style-type: none"> • To protect, conserve and enhance the Union's natural capital; • To turn the Union into a resource-efficient, green, and competitive low-carbon economy; and • To safeguard the Union's citizens from environment-related pressures and risks to health and wellbeing. <p>Two additional horizontal priority objectives complete the programme:</p> <ul style="list-style-type: none"> • To make the Union's cities more sustainable; and • To help the Union address international environmental and climate challenges more effectively.
	Freshwater Fish Directive (2006/44/EC)	<p>Objectives seek to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations.</p>
	Conservation of Natural Habitats and of Wild Flora and Fauna (Habitats) Directive (92/43/EEC)	<p>The Habitats Directive (92/43/EEC) provides legal protection for habitats and species of wild plants and animals of European importance. The Directive protects around 1200 European species, other than birds, which are considered to be endangered, vulnerable, rare and/or endemic. Included in the Directive are mammals, reptiles, fish, crustaceans, insects, molluscs, bivalves and plants. Together with the Birds Directive, it underpins a European network of protected areas known as Natura 2000: Special Protection Areas (SPAs, classified under the Birds Directive) and Special Areas of Conservation (SACs, classified under the Habitats Directive).</p> <p>Objectives of the Habitats Directive include:</p> <ul style="list-style-type: none"> • Propose and protect sites of importance to habitats, plant and animal species; • Establish a network of Natura 2000 sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II, to enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range; • Carry out comprehensive assessment of habitat types and species present; and • Establish a system of strict protection for the animal species and plant species listed in Annex IV.
	Conservation of Wild Birds (Birds) Directive (2009/147/EC)	<ul style="list-style-type: none"> • The Birds Directive protects all wild birds, their nests, eggs and habitats within the European Community. It gives EU member states the power and responsibility to classify Special Protection Areas (SPAs) to protect birds which are rare or vulnerable in Europe, as well as all migratory birds which are regular visitors. • Objectives seek to prevent and eliminate the causes of bird species loss and maintain and enhance current levels of biodiversity:

Topic	Title	Summary of Objectives: European
		<ul style="list-style-type: none"> • Preserve, maintain or re-establish a sufficient diversity and area of habitats for all the species of birds referred to in Annex I; • Preserve, maintain and establish biotopes and habitats to include the creation of protected areas (Special Protection Areas); • Ensure the upkeep and management in accordance with the ecological needs of habitats inside and outside the protected zones, re-establish destroyed biotopes and creation of biotopes; and • Measures for regularly occurring migratory species not listed in Annex I is required as regards their breeding, moulting and wintering areas and staging posts along their migration routes; and • Ensuring the protection of wetlands and particularly wetlands of international importance.
	Prioritised Action Framework for Natura 2000 (2014-2020)	This plan identifies the range of actions needed to help improve the status of Ireland's habitats and wildlife.
Air Quality/ Noise	EU Clean Air Package (2013) & A Clean Air Programme for Europe (COM(2013) 918)	The clean air package aims to substantially reduce air pollution across the EU. The proposed strategy sets out objectives for reducing the health and environmental impacts of air pollution by 2030, and contains legislative proposals to implement stricter standards for emissions and air pollution. The package was published by the Commission on 18 December 2013, and consists of a communication on the 'clean air programme for Europe', plus three legislative proposals on emissions and air pollution.
	Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) and Fourth Daughter Directive (2004/107/EC)	<p>The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) was published in May 2008. It replaced the Framework Directive and the first, second and third Daughter Directives.</p> <p>The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999.</p> <p>The fourth Daughter Directive was transposed into Irish legislation by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58 of 2009).</p>
	Industrial Emissions Directive (IED) (2010/75/EU)	The IED is the successor of the IPPC Directive. Objectives seek the reduction and control of emissions to the atmosphere arising from industrial activities through established permit procedures and the requirements for discharges (integrated pollution prevention and control (IPPC)). The Directive was transposed onto Irish law under the Industrial Emissions Regulations S.I. 138/2013.
	National Emissions Ceiling Directive (NECD) (2016/2284/EU)	<p>The Convention on Long-Range Transboundary Air Pollution (CLRTAP) and aims to control and reduce local and long-range air pollution. The protocol is enacted in Directive (EU) 2016/2284 of the European Parliament of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing the previous National Emissions Ceiling Directive (NECD) (2001/81/EC).</p> <p>The Directive sets national reduction commitments for the five pollutants (sulphur dioxide, nitrogen oxides, volatile organic compounds, ammonia and fine particulate matter) The NECD sets national emission ceilings for four main pollutants, namely that of sulphur dioxide (SO₂), nitrogen oxides (NO_x), volatile organic compounds (VOCs) and ammonia (NH₃). These pollutants are responsible for long-range transboundary air pollution such as acidification, eutrophication and ground-level ozone pollution. Data on these four pollutants are reported to the European Commission under the National Emissions Ceiling Directive on an annual basis.</p>

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Topic	Title	Summary of Objectives: European
Sustainable Development	European Green Deal (EC, December 2019)	<p>The green deal is the strategy to make the EU more sustainable by 2050, recognising climate change and degradation of the natural environment as critical threats. It has an action plan which sets out a roadmap and actions. The actions areas cover the following:</p> <ul style="list-style-type: none"> • Biodiversity: measures to protect ecosystems • From Farm to Fork: Looking at more sustainable food production systems • Sustainable agriculture: across the EU in both agriculture and in rural areas, driven by the CAP • Clean energy • Sustainable industry: Sustainable and more environmentally-friendly production cycles • Building and renovating: The need for a cleaner construction sector • Sustainable mobility: Promoting more sustainable means of transport • Eliminating pollution: Measures to cut pollution rapidly and efficiently, aiming for zero pollution, and supported by the EU Chemicals Strategy • Climate action: Aiming to make the EU climate-neutral by 2050
	EU Action Plan: Towards a Zero Pollution for Air, Water and Soil (and annexes) (EC, May 2021)	<p>The Zero Pollution Action Plan is a key deliverable of the European Green Deal. The vision for 2050 is for air, water and soil pollution to be reduced to levels no longer considered harmful to health and natural ecosystems, that respect the boundaries with which our planet can cope, thereby creating a toxic-free environment. The action plan aims to strengthen the EU green, digital and economic leadership, whilst creating a healthier, socially fairer Europe and planet. It provides a compass to mainstream pollution prevention in all relevant EU policies, to step up implementation of the relevant EU legislation and to identify possible gaps.</p>
	EU Chemicals Strategy for Sustainability Towards a Toxic-Free Environment (EC, October 2021)	<p>Global chemical use is projected to double by 2030, and while essential for life, chemicals can also have hazardous properties and can be toxic to human health and the environment. As such, the EU has prepared this strategy which also ties into the Green Deal and the Circular Economy Action Plan. It aims for zero pollution, including reducing hazardous waste streams, and to protect human and environmental health. It aims to streamline the coherence between waste, chemicals and products legislation, aiming to close gaps in how hazardous substances may be handled differently under different legislation.</p>
	The Common Agricultural Policy (CAP)	<p>Aims to provide farmers with a reasonable standard of living, consumers with quality food at fair prices and to preserve rural heritage. With increased development pressure from urban areas, protection of rural communities and agricultural enterprise must be considered.</p>
	Horizon Europe	<p>Horizon Europe is the EU's key funding programme for research and innovation with a budget of €95.5 billion. It supports European partnerships and operates across five 'mission areas' as follows:</p> <ul style="list-style-type: none"> • Adaptation to climate change including societal transformation • Healthy oceans, seas, coastal and inland waters • Cancer • Soil health and food • Climate-neutral and smart cities

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Topic	Title	Summary of Objectives: European
	EC LIFE Programme (2021-2027)	This programme will succeed Horizon 2020 and the EC has indicated it will be the only European funding programme exclusively aimed at the areas of environment, energy and climate. The key priorities will be to halt biodiversity loss, protection and improvement of the environment, and enabling the transition to a circular economy.
	EUROPE 2020 A Strategy for Smart, Sustainable and Inclusive Growth (COM/2010/2020)	Europe 2020 is a 10-year strategy proposed by the European Commission on 3 March 2010 for advancement of the economy of the European Union. It aims at "smart, sustainable, inclusive growth" with greater coordination of national and European policy. It follows the Lisbon Strategy for the period 2000–2010.
	Horizon 2020: the EU Framework Programme for Research and Innovation (2014-2020)	<p>Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market. Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness.</p> <p>Seen as a means to drive economic growth and create jobs, Horizon 2020 has the political backing of Europe's leaders and the Members of the European Parliament. They agreed that research is an investment in our future and so put it at the heart of the EU's blueprint for smart, sustainable and inclusive growth and jobs.</p>
	SEA Directive (2001/42/EC)	This Directive requires that Plans & Programmes must take into account protection of the environment and integration of the Plan into the sustainable planning of the country as a whole. Eleven sectors are specified in the Directive and Competent Authorities (Plan/ Programme makers) must subject specific Plans and Programmes for these sectors to an environmental assessment where they are likely to have significant effects on the environment. The SEA Directive was transposed into Irish law under S.I. 435/2004, as amended in 2011.
	EIA Directive (85/337/EEC), as amended by Directive 97/11/EC & Directive 2014/52/EU	The Directive's objective is to require Environmental Impact Assessment of the environmental effects of those public and private projects, which are likely to have significant effects on the environment. The EIA Directive was transposed into Irish law under S.I. 349/1989 (as amended).
	EU Sustainable Development Strategy (EU SDS)	The overarching sustainable development policy document in the EU. During the 2009 review the EU noted a number of unsustainable trends that require urgent action including a decrease in high energy consumption in the transport sector in line with the 2020 Strategy.
	Indirect Land Use Change Directive (2015/1513)	<p>Directive 2015/1513 amends the Renewable Energy Directive and the Fuel Quality Directive to address indirect land-use change (ILUC). Member States are obliged to transpose the Directive into national legislation by 10 September 2017 and should establish the level of their national indicative sub-targets for advanced biofuels by 6 April 2017.</p> <p>While biofuels are important in helping the EU meet its greenhouse gas reductions targets, biofuel production typically takes place on cropland which was previously used for other agriculture such as growing food or feed. Since this agricultural production is still necessary, it may be partly displaced to previously non-cropland such as grasslands and forests. This process is known as indirect land use change (ILUC).</p>
	Ecodesign Framework Directive (2009/125/EC)	This Directive establishes a framework for the setting of Community eco design requirements for energy-related products with the aim of ensuring the free movement of such products within the internal market. This Directive provides for the setting of requirements which the energy-related products covered by implementing measures must fulfil in order to be placed on the market and/or put into service. It contributes to sustainable development by increasing energy efficiency and the level of protection of the environment, while at the same time increasing the security of the energy supply.

Topic	Title	Summary of Objectives: European
Water	Water Framework Directive (WFD) (2000/60/EC) (as amended by Decision 2455/2001/EC and Directives 2008/32/EC, 2008/105/EC and 2009/31/EC)	<p>WFD objectives overall seek to maintain and enhance the quality and quantity of all surface waters, i.e. rivers, estuaries, coasts and aquifers, in the EU and to prevent the deterioration of aquatic ecosystems and associated wetlands by setting out a timetable until 2027 to achieve good ecological status or potential. Member States are required to manage the effects on the ecological quality of water which result from changes to the physical characteristics of water bodies. Action is required in those cases where these “hydro-morphological” pressures are having an ecological impact which will interfere with the ability to achieve WFD objectives. The assessment of potential impacts on water quality needs to be considered in the context of the WFD and the River Basin Management Plan and Programme of Measures for the River Basin districts which lays out the objectives for all waters within the individual district. It is noted the next cycle of River Basin Management Plans is due in 2022. Key objectives of the WFD include:</p> <ul style="list-style-type: none"> • Identification and establishment of individual river basin districts; • Preparation of individual river basin management plans for each of the catchments. These contain the main issues for the water environment and the actions needed to deal with them; • Establishment of a programme of monitoring water quality in each RBD; and • Establishment of a Register of Protected Areas (includes areas previously designated under the Freshwater Fish and Shellfish Directives which have become sites designated for the protection of economically significant aquatic species under WFD and placed on the Protected Areas register). <p>Promotion of sustainable management of the water environment by carefully considering current land use and future climate scenarios, minimising the effects of flooding and drought events and facilitating long term improvements in water quality, including the protection of groundwater near landfill sites, as well as minimising agricultural runoff.</p> <p>The following Directives have been subsumed into the Water Framework Directive:</p> <ul style="list-style-type: none"> • The Drinking Water Abstraction Directive; • The Sampling Drinking Water Directive; • The Exchange of Information on Quality of Surface Freshwater Directive; • The Groundwater (Dangerous Substances) Directive; and • The Dangerous Substances Directive.
	Marine Strategy Framework Directive (MSFD) (2008/56/EC)	The aims of the MSFD are to protect the marine environment across Europe through achieving and maintaining good environmental status of marine waters by 2020, and acts as complimentary legislation to the WFD. To achieve this goal the directive has set out marine regions; Ireland falls within the North-east Atlantic Ocean Region and for the purposes of the MSFD Ireland is required to produce a Maritime Spatial Plan (MSP). Ireland’s draft “National Marine Planning Framework” (i.e. first MSP) was launched for public consultation in November 2019 and the final version is due soon.
	Floods Directive (2007/60/EC)	The Floods Directive applies to river basins and coastal areas at risk of flooding. It basically prescribes a three-step procedure for the assessment and management of flood risks: First step: Preliminary Flood Risk Assessment; Second step: Risk Assessment; and Third step: Flood Risk Management Plans.
	Bathing Water Directive (2006/7/EC)	The overall objective of the revised directive remains the protection of public health whilst bathing, but it also offers an opportunity to improve management practices at bathing waters and to standardise the information provided to bathers across Europe. Bathing waters are an important resource and it is therefore essential that the standards within the

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Topic	Title	Summary of Objectives: European
		Bathing Water Directive are adhered to. The Directive was transposed onto Irish law under the Bathing Water (Amendment) Regulations S.I. 79/2008.
	Groundwater Directive (2006/118/EC)	Objectives seek to maintain and enhance the quality of all groundwaters in the EU. The Environmental Objectives (Groundwater) Regulations S.I. 9/2010 was transposed into Irish Law and gives effect to the Groundwater Directive
	Drinking Water Directive (80/778/EEC) as amended by Directive 98/83/EC and new Directive (EU) 2020/2184 (recast)	The primary objective is to protect the health of the consumers in the European Union and to make sure drinking water is wholesome and clean. Following a review of fitness, the recast directive will enter in force from January 2021. The revised directive goes beyond the WHO's recommendations and applies more stringent quality standards and introduces a risk-based approach.
	Urban Wastewater Treatment Directive (91/271/EEC), as amended by Directive 98/15/EEC	The primary objective is to protect the environment from the adverse effects of discharges of urban wastewater, by the provision of urban wastewater collecting systems (sewerage) and treatment plants for urban centres. The Directive also provides general rules for the sustainable disposal of sludge arising from wastewater treatment.
	Sewage Sludge Directive (86/278/EEC)	The objective of the directive is to encourage the use of sewage sludge in agriculture and to regulate its use in such a way as to prevent harmful effects on soil, vegetation, animals and man. To this end, it prohibits the use of untreated sludge on agricultural land unless it is injected or incorporated into the soil. The Directive is given effect in Irish law by the Waste Management (Use of Sewage Sludge in Agriculture) (Amendment) Regulations (S.I. 267/2001).
	Nitrates Directive (91/676/EEC)	The directive has the objective of reducing water pollution caused or induced by nitrates from agricultural sources. Under the regulations, sewage sludge is considered a fertiliser under the definitions of the regulations: "fertiliser" means any substance containing nitrogen or phosphorus or a nitrogen compound or phosphorus compound utilised on land to enhance growth of vegetation and may include livestock manure, the residues from fish farms and sewage sludge. The Nitrates Regulations provide for the mandatory implementation of agricultural measures for protecting surface and groundwater quality by all Irish farmers. The measures include limits on storage and land spreading of nutrients, including no-spread zones adjacent to drinking water abstraction points, and uncultivated buffer/riparian strips, to prevent nutrients and sediment from entering water.
	Priority Substances Directive (2013/39/EU)	This directive amends Directives 2000/60/EC and 2008/105/EC regarding priority substances and water policy. Directive 2000/60/EC set out a strategy against water pollution, including the identification of priority substances pose a significant risk to, or through, the aquatic environment.
	Environmental Liabilities Directive (2004/35/EC)	The Directive was transposed onto Irish law under S.I. 547/2008. The objective is the 'polluter pays' principle wherein those whose activities have caused environmental damage are held financially liable for remedying that damage; the legislation is particularly aimed at impacts to water quality status under the Water Framework Directive.
	A Blueprint to Safeguard Europe's Water Resource (COM(2012)673)	This Communication outlines actions that relate to better implementation of current water legislation, integration of water policy objectives into other policies and filling gaps particularly in relation to water quantity and efficiency. These actions are to ensure that water of sufficient quantity and good quality is available to service the needs of people as well as the environment and the EU's economy. The Blueprint's time horizon is closely related to the EU 2020 Strategy particularly the Resource Efficiency Roadmap, of which the Blueprint is the water milestone. However, the Blueprint covers a longer time span, up to 2050, and is expected to be the driver of long-term EU water policy.
Waste	Waste Framework Directive (2008/98/EC)	The directive sets out the definitions of waste and basic management principles for waste in order to ensure waste is managed so as to not impact the environment or human health. The Directive lays down some basic waste

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Topic	Title	Summary of Objectives: European
		management principles: it requires that waste be managed without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odours, and without adversely affecting the countryside or places of special interest. The Directive requires that waste legislation and policy of EU Member States is applied according to a waste management hierarchy.
	EU Circular Economy Action Plan (2020)	In response to the challenges faced regarding the sustainable use of resources linking issues such as the extraction of raw materials, the production and use of products and how we handle waste, the EU signed up to a Circular Economy (CE) Package in December 2015. The EU's first Circular Economy Action Plan was completed in 2019, with much progress made on its 54 actions. The new Circular Economy Action Plan was published in March 2020 and forms one of the pillars of the EU Green Deal – the strategy to make the EU more sustainable by 2050. As part of this Action Plan, the Waste Framework Directive was amended in 2018 by Amending Directive (EU) 2018/851. The revised directive places responsibility on EU Member States to improve their waste management systems, to improve the efficiency of resource use, and to ensure that waste is valued as a resource.
	Amendment to the EU Waste Framework Directive, 2018	The new Directive places responsibility on EU Member States to improve their waste management systems, to improve the efficiency of resource use, and to ensure that waste is valued as a resource.
	Landfill Directive (99/31/EC)	The Landfill Directive sets targets to reduce landfilling of biodegradable municipal waste.
	Use and Disposal of Animal By-products (2011/EU/142)	Commission Regulation (EU) No 142/2011 of 25 February 2011 implementing Regulation (EC) No 1069/2009 of the European Parliament and of the Council laying down health rules as regards animal by-products not intended for human consumption and implementing Council Directive 97/78/EC as regards certain samples and items exempt from veterinary checks at the border under that Directive.
	EU Health Rules Regarding Animal By-products Not Intended for Human Consumption Directive (2002/1774/EC)	This Directive lays down animal and public health rules for: <ul style="list-style-type: none"> the collection, transport, storage, handling, processing and use or disposal of animal by-products, to prevent these products from presenting a risk to animal or public health; the placing on the market and, in certain specific cases, the export and transit of animal by-products and those products derived therefrom referred to in Annexes VII and VIII.
Population/ Human Health	Seveso III Directive (2012/18/EU)	The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances or 'COMAH') Regulations 2015 (S.I. 209/2015) implement the Seveso III Directive in Ireland and seeks to reduce the risk and to limit the consequences to both man and the environment, of accidents at manufacturing and storage facilities involving dangerous substances that present a major accident hazard.
	Biocidal Products (98/8/EC and 2007/107/EC)	A biocide is classified as a substance (whether chemical or biological) designed to destroy or render harmless a harmful organism (e.g. disinfectants, preservatives etc.). These products have a high degree of regulation owing to the potential effects on human health and the environment. The directive is regularly updated as new products are manufactured and authorised. The new Biocidal Products Regulation (Regulation EU 528/2012) has been transposed by the European Union (Biocidal Products) Regulations S.I. 427/2013.
	Environmental Noise Directive (END) (2002/49/EC)	Objectives seek to limit the harmful effects to human health from environmental noise.

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Topic	Title	Summary of Objectives: European
Climate/ Energy	The European Climate Law (Regulation (EU) 2021/1119)	In March 2020, the European Commission proposed the first European Climate Law which aims to write into law the goal set out in the European Green Deal; for Europe's economy and society to become climate-neutral by 2050. This sets out a legally binding target of net zero greenhouse gas emissions for EU countries as a whole, by cutting emissions, investing in green technologies and protecting the natural environment. The law was formally adopted in July 2021.
	The EU Policy Framework for Climate and Energy in the period from 2020 to 2030	A Policy Framework for Climate and Energy in the Period 2020-2030 (EU (COM),2014) sets out the EU's 2030 framework for climate and energy, including EU-wide targets and policy objectives for the period between 2020 and 2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet its long-term 2050 greenhouse gas reductions target. This Communication develops a framework for future EU energy and climate policies and launches a process to arrive at a shared understanding of how to take these policies forward in the future. This framework sets targets for the period 2020 to 2030: <ul style="list-style-type: none"> • At least 40% cut in greenhouse gas emissions (from 1990 levels); • At least 32% share for renewable energy; and • At least 32.5% improvement in energy efficiency.
	Effort Sharing Decision 2009 (Decision No. 406/2009/EU)	The 2009 Effort Sharing Decision (Decision No. 406/2009/EU) set individual Member State targets for reductions in non-ETS GHG emissions. The target agreed for Ireland for the year 2020 is that non-ETS emissions should be 20% below their level in 2005 compared to an EU average reduction of 10%. The non-ETS target is legally binding on the State.
	EU Effort Sharing Regulation for 2030 (EU/2018/842)	This legislation establishes binding annual GHG targets for Member States for the periods 2013–2020 and 2021–2030. The targets cover most sectors not included in the EU ETS, such as transport, buildings, agriculture and waste. If national targets are met, this will lead to a collective 10% reduction by 2020 in total EU emissions from the covered sectors, and a 30% reduction by 2030 (compared to 2005 levels). To achieve EU climate neutrality by 2050, the EC is proposing to revise this Regulation and has published an inception impact assessment and is conducting public consultation on the revision.
	The EU 20-20-20 Climate and Energy Package Agreement (2007)	The climate and energy package are a set of binding legislation which aims to ensure the European Union meets its ambitious climate and energy targets for 2020. The targets were set by EU leaders in March 2007, when they committed Europe to become a highly energy-efficient, low carbon economy, and were enacted through the climate and energy package in 2009. These targets, known as the '20-20-20' targets, set three key objectives for 2020: <ul style="list-style-type: none"> • A 20% reduction in EU greenhouse gas emissions from 1990 levels; • Raising the share of EU energy consumption produced from renewable resources to 20%; and • A 20% improvement in the EU's energy efficiency. These targets represent an important first step towards building a low-carbon economy. They are also headline targets of the Europe 2020 strategy for smart, sustainable and inclusive growth. This recognises that tackling climate and energy challenge contributes to the creation of jobs, the generation of 'green' growth and a strengthening of Europe's competitiveness. In relation to reductions in GHG emissions, the 2009 Effort Sharing Decision (Decision No. 406/2009/EU) set individual Member State targets for reductions in non-ETS GHG emissions. The two main directives

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Topic	Title	Summary of Objectives: European
		which set about achieving this target are the Energy Efficiency Directive (2012/27/EC, transposed into Irish law by the Energy Efficiency Obligation Scheme Regulations 2014 S.I. 131/2014) and the Renewable Energy Sources (RES) Directive (2009/28/EC, transposed into Irish law by the Renewable Energy Regulations S.I. 147/2011).
	EU Clean Energy Package (2016)	8 proposed Regulations and Directives, half of which were finalised and published in 2018 and the other half published in 2019. The Energy package includes an ambitious new target of at least 32% in renewable energy by 2030. Provides a new energy rulebook under which each Member State drafts National Energy and Climate Plans (NECPs) for 2021-2030 setting out how to achieve their energy union targets, and in particular the 2030 targets on energy efficiency and renewable energy.
	Renewable Energy Directive (2009/28/EC)	The Renewable Energy Directive establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020. A national target of 16% renewable energy by 2020 was set for Ireland.
	Recast Renewable Energy Directive (2018/2001/EU)	The recast directive moves the legal framework to 2030 and sets a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023, and comprises measures for the different sectors to make it happen.
	EU Strategy on Adaptation to Climate Change (2013)	The strategy was adopted by the EC in April 2013. It outlines the measures for taking climate change preparedness to a new level. The strategy has three main objectives: <ul style="list-style-type: none"> • Promote climate action in Member States through encouraging the adoption of adaptation strategies; • The promotion of informed decision-making through addressing knowledge gaps and the development of the European Climate Adaptation Platform for better knowledge dissemination; and • Promoting adaptation in key vulnerable sectors.
	2030 Energy Strategy and A Policy Framework for Climate and Energy in the Period 2020-2030 (EU (COM),2014)	EU countries have agreed on a new 2030 Framework for climate and energy, including EU-wide targets and policy objectives for the period between 2020 and 2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet its long-term 2050 greenhouse gas reductions target. This Communication develops a framework for future EU energy and climate policies and launches a process to arrive at a shared understanding of how to take these policies forward in the future.
	Energy Roadmap 2050	The ultimate goal is to cut EU-wide emissions by 90% of 1990 levels by 2050. The EC analysed the implications of this goal as part of its communication “A Roadmap for moving to a competitive low carbon economy in 2050”. This 2050 Roadmap explores the challenges of this decarbonisation objective while maintaining competitiveness as well as security of supply.
	European Framework Policy’s Seventh Action Programme and Roadmap to a Resource Efficient Europe	Both focus on encouraging a resource efficient, low carbon economy. Both have energy and climate targets. The Roadmap to a Resource Efficient Europe’s main aim is to “to decouple economic growth from resource use and its environmental impacts, and proposed a long-term vision, 2020 milestones and a number of short-term actions to start the transition”.
	EU Emissions Trading Directive (2003/87/EC)	Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (Text with

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Topic	Title	Summary of Objectives: European
		EEA relevance). This Directive establishes a scheme for greenhouse gas emission allowance trading within the Community (hereinafter referred to as the "Community scheme") in order to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner.
	Energy Efficiency Directive (2012/27/EC) as amended	Under the Energy Efficiency Directive: <ul style="list-style-type: none"> • EU countries make energy efficient renovations to at least 3% of buildings owned and occupied by central government; • EU governments should only purchase buildings which are highly energy efficient; and • EU countries must draw-up long-term national building renovation strategies which can be included in their National Energy Efficiency Action Plans.
	EU Energy Performance of Buildings Directive (2002/91/EC) and updated Directive (2010/31/EU)	The 2010 Energy Performance of Buildings Directive and the 2012 Energy Efficiency Directive are the EU's main legislation when it comes to reducing the energy consumption of buildings. Under the Energy Performance of Buildings Directive: <ul style="list-style-type: none"> • Energy performance certificates are to be included in all advertisements for the sale or rental of buildings; • EU countries must establish inspection schemes for heating and air conditioning systems or put in place measures with equivalent effect; and • All new buildings must be nearly zero energy buildings by 31 December 2020 (public buildings by 31 December 2018). <p>EU countries must set minimum energy performance requirements for new buildings, for the major renovation of buildings and for the replacement or retrofit of building elements (heating and cooling systems, roofs, walls, etc.) EU countries have to draw up lists of national financial measures to improve the energy efficiency of buildings.</p>
	Second European Climate Change Programme (ECCP II) 2005	The objectives seek to develop the necessary elements of a strategy to implement the Kyoto Protocol.
	EU Fuel Quality Directive (2009/30/EC)	This Directive amends Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions and amending Council Directive 1999/32/EC as regards the specification of fuel used by inland waterway vessels and repealing Directive 93/12/EEC.
	Medium Combustion Plant Directive (MCPD) Directive (EU) 2015/2193	This Directive concerns the limitation of emissions of certain pollutants into the air from medium combustion plants (Medium Combustion Plant (MCP) Directive) and regulates pollutant emissions from the combustion of fuels in plants with a rated thermal input equal to or greater than 1 megawatt (MWth) and less than 50 MWth.
	Directive (UE) 2015/1513 amending Directives 98/70/CE and 2009/28/CE - Regarding the promotion of renewable energy usage	The Directive (EU) 2015/1513 of the European Parliament and of the Council of September 9th, 2015 was issued, amending Directive 98/70/EC relating to the quality of petrol and diesel fuels and amending Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 10 September 2017.
	A Sustainable Bioenergy Policy for the period after 2020 (under consultation)	EU Member States have agreed on a new policy framework for climate and energy. In January 2014, in its Communication on a policy framework for climate and energy in the period from 2020 to 2030, the Commission stated that 'an improved biomass policy will also be necessary to maximise the resource-efficient use of biomass in order to deliver robust and verifiable greenhouse gas savings and to allow for fair competition between the various uses of

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Topic	Title	Summary of Objectives: European
		biomass resources in the construction sector, paper and pulp industries and biochemical and energy production. This should also encompass the sustainable use of land, the sustainable management of forests and address indirect land-use effects as with biofuels'.
	A Roadmap for moving to a competitive low carbon economy in 2050 (EC (COM), 2011/0112))	A Roadmap for Moving to a Competitive Low Carbon Economy in 2050 is a fifteen-page document produced by the European Commission in 2011 as a communication to other European Union (EU) institutions. As part of the Europe 2020 flagship initiative for a resource-efficient Europe, it outlines a long-term policy framework for actions to be taken across the EU region to ensure that 2050 greenhouse gas reduction targets are met.
	Transport White Paper 2011 (Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system) (COM/2011/0144 final)	The European Commission adopted a roadmap of 40 concrete initiatives for the next decade to build a competitive transport system that will increase mobility, remove major barriers in key areas and fuel growth and employment. At the same time, the proposals will dramatically reduce Europe's dependence on imported oil and cut carbon emissions in transport by 60% by 2050. The roadmap confirms that our low-carbon goal is economically feasible. All the scenarios reach it with no major differences in overall costs or security of supply implications.
	EU Biofuels Directive (2003/30/EC)	The Directive on the Promotion of the use of biofuels and other renewable fuels for transport, officially 2003/30/EC and popularly better known as the biofuels directive is a European Union directive for promoting the use of biofuels for EU transport. The directive entered into force in May 2003, and stipulates that national measures must be taken by countries across the EU aiming at replacing 5.75% of all transport fossil fuels (petrol and diesel) with biofuels by 2010. The directive also called for an intermediate target of 2% by 31 December 2005. The target of 5.75% is to be met by 31 December 2010. The percentages are calculated on the basis of energy content of the fuel and apply to petrol and diesel fuel for transport purposes placed on the markets of member states. Member states are encouraged to take on national "indicative" targets in conformity with the overall target.
	Alternative Fuels Infrastructure Directive (2014/94/EU) (<i>Still to be transposed into Irish Law</i>)	This Directive establishes a common framework of measures for the deployment of alternative fuels infrastructure in the Union in order to minimise dependence on oil and to mitigate the environmental impact of transport. This Directive sets out minimum requirements for the building-up of alternative fuels infrastructure, including recharging points for electric vehicles and refuelling points for natural gas (LNG and CNG) and hydrogen, to be implemented by means of Member States' national policy frameworks, as well as common technical specifications for such recharging and refuelling points, and user information requirements.
	Roadmap to a Resource Efficient Europe (Roadmap 2050)	The mission of Roadmap 2050 is to provide a practical, independent and objective analysis of pathways to achieve a low-carbon economy in Europe, in line with the energy security, environmental and economic goals of the European Union. The Roadmap focuses on establishing EU policy to cut total greenhouse gas emissions by 80-95% (compared to 1990 levels) by 2050. The National Low-Carbon Roadmap will be coordinated by the Department of the Environment, Community and Local Government with substantial input from other relevant Departments. The sectoral roadmap for the transport sector will be developed by the Department of Transport, Tourism and Sport.
	Governance of the Energy Union and Climate Action Regulation (2018/1999)	The EU Governance of the Energy Union and Climate Action Regulation sets the overall framework for the achievement of the EU climate and energy 2030 targets.
Landscape	European Landscape Convention, (Florence, 2000)	The Convention's purpose is to promote landscape protection, management and planning of European landscapes and to organise European co-operation on landscape issues. It is the first international treaty to be exclusively concerned with protection, management and enhancement of European landscape. It is extremely wide in scope: The Convention

Topic	Title	Summary of Objectives: European
		<p>applies to the Parties' entire territory and covers natural, rural, urban and rural-urban transitional areas, also including land, inland water and marine areas. The Convention covers every-day or degraded landscapes as well as those that can be considered outstanding i.e. recognition of the importance of all landscape types.</p> <p>The Convention incorporates a number of measures which are to be undertaken to put into effect at national level General Measures, including:</p> <ul style="list-style-type: none"> • To recognise landscapes in law as being an essential component of people's surroundings; • The establishment and implementation of policies which aim to protect landscapes, and to inform landscape management and planning considerations; • To better incorporate the public, local and regional authorities as well as other organisations in defining and implementing landscape policies; and • The integration of landscape into local and regional planning policies that have possible direct or indirect impacts on the landscape.
Cultural Heritage	Convention for the Protection of the Archaeological Heritage of Europe (revised) (Valletta, 1992)	Objective is to protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study.
	Convention for the Protection of the Architectural Heritage of Europe (Granada, 1985)	Objectives seek to provide a basis for protection of architectural heritage and are a means for proclaiming conservation principles, including a definition of what is meant by architectural heritage, such as monuments, groups of buildings and sites. The Convention also seeks to define a European standard of protection for architectural heritage and to create legal obligations that the signatories undertake to implement.

Review of National Level Plans, Programmes and Policies

Topic	Title	Summary of Objectives: National
Biodiversity	National Biodiversity Action Plan 2017 – 2021	In response to the requirements set out in Article 6 of the UN Convention of Biological Diversity 1992, the first Biodiversity Action Plan (BAP) was prepared by the Department of Arts, Heritage and the Gaeltacht, subsequently revised in 2011. The aims are to achieve Ireland's Vision for Biodiversity through addressing issues ranging from improving the management of protected areas to increasing awareness and appreciation of biodiversity and ecosystem services. Ireland's third iteration of the BAP for conserving and restoring Ireland's biodiversity covers the period 2017 to 2021.
	Wildlife Acts 1976 – 2012 (as amended)	The purpose of the Wildlife Acts 1976-2012 is to provide for the protection of wildlife (both flora and fauna) and the control of activities, which may impact adversely on the conservation of wildlife.
	Flora Protection Order 2015	Objectives are to protect listed flora and their habitats from alteration, damage or interference in any way. This protection applies wherever the plants are found and is not confined to sites designated for nature conservation.
	European Communities (Natural Habitats) Regulations, SI 94/1997,	These Regulations give effect to Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and the Minister to designate special areas of conservation (endangered species and habitats of

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Topic	Title	Summary of Objectives: National
	as amended S.I. 233/1998 and S.I. 378/2005	endangered species) as a contribution to an EU Community network to be known as NATURA 2000. See EU Habitats Directive.
	All Ireland Pollinator Plan 2015-2020	Ireland has developed a strategy to address pollinator decline and protect pollinator service. A total of 81 actions have been identified in order to achieve this. It is about raising awareness about pollinators and how to protect them.
	Quality of Salmonid Waters Regulations 1988 (S.I. 293/1988)	Prescribe quality standards for salmonid waters and designate the waters to which they apply, together with the sampling programmes and the methods of analysis and inspection to be used by local authorities to determine compliance with the standards. Also, give effect to Council Directive No. 78/659/EEC on the quality of fresh waters needing protection or improvement in order to support fish life. See EU Water Framework Directive.
	NPWS Conservation Plans for SACs and SPAs and NHAs	The NPWS produces a draft conservation plan for each SAC, SPA and NHA. Each plan lists the wildlife resources of the area, the current human uses, any conflicts between the two, and strategies for retaining the conservation value. These documents are made available on the NPWS website and to interested parties for a consultation period, following which the final version of the conservation plan is completed. It is intended that plans will be reviewed every 5 years. It is expected that these plans will be consulted/referenced during the preparation of farm management plans for holdings within and nearby the nature conservation site.
	National Peatland Strategy (DAHG, 2015) and National Peatlands Strategy Progress Report 2017 (DCHG, 2018)	In April 2011 the Government made a number of key decisions relating to the conservation and management of Ireland's peatlands, particularly those sites nominated for designation as Special Areas of Conservation and Natural Heritage Areas. A commitment was made to draw up a national strategy on peatlands conservation and management, in consultation with bog owners and other stakeholders, to deal with long-term issues such as land management & development, restoration, conservation, tourism potential, carbon accounting and community participation in managing this resource. In order to ensure that actions are implemented, the Peatlands Strategy Implementation Group (PSIG) was established, which comprises a cross-departmental group to monitor the strategy's implementation. The group publish annual National Progress Reports.
	National Raised Bog SAC Management Plan 2022-2027 (2017)	In 2014, following approval by Government, the Minister for Arts, Heritage and the Gaeltacht, published three documents, a draft National Peatlands Strategy, a draft National Raised Bog Special Areas of Conservation (SAC) Management Plan and a Review of Raised Bog Natural Heritage Areas (NHAs). The Raised Bog Management Plan sets out a roadmap for the long-term management, restoration and conservation of protected raised bogs in Ireland. This Plan was published on 21 December 2017. Together these documents set out a strategic, long term vision for the future use and management of Ireland's peatlands including specific measures for the protection of sites designated for the protection of endangered bog habitats.
	Peatland Restoration Plan (Bord na Móna, 2020)	This plan involves an investment of €115 million and intends to secure a store of over 100m tonnes of carbon and capture millions of tonnes more in the coming years.
	Brown to Green Strategy (Bord na Móna)	The strategy moves the company away from traditional peat business into renewables and resource recovery. The strategy, driven by climate change and decarbonisation initiatives has resulted in a cessation of peat harvesting in 2020 and a shift toward bog rehabilitation in the medium to long term.
	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011)	The Birds Directive was transposed into Irish law under the Birds and Habitats Regulations S.I. 477/2011 (as amended).

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Topic	Title	Summary of Objectives: National
	Fisheries Natura Plans & Declarations made under European Union (Birds and Natural Habitats) (Se-fisheries) Regulations 2013, as amended	<p>Sea-fisheries are in Natura 2000 areas are regulated in accordance with:</p> <ul style="list-style-type: none"> • The European Communities (Birds and natural Habitats) Regulations 2011 (S.I. 477/2011); and • The European Union (Birds and Natural Habitats) (Sea-fisheries) Regulations 2013 (S.I. 290/2013). <p>These two sets of Regulations transpose into Irish law the obligations on the Minister with regard to sea-fisheries arising from the EU Habitats and Birds Directives. Regulation 27 of SI 477 of 2011 places legal obligations on the Minister for Agriculture Food and the Marine in relation to his functions. These obligations transpose article 6.2 of the Habitats Directive and in short require the Minister to manage sea-fisheries to ensure that significant impacts on designated habitats and species are avoided.</p> <p>Regulation 42 of S.I. 477/2011 places legal obligations on the Minister for Agriculture Food and the Marine in consenting to or adopting a plan or project that may have significant impacts on a Natura 2000 site. These obligations transpose article 6.3 of the Habitats Directive. In short, the Minister is required to conduct a screening for appropriate assessment before consenting to or adopting the plan or project. On the basis of that screening assessment, the Minister must determine if an appropriate assessment is required. He must conclude that it is required where he cannot exclude significant impacts based on objective scientific information. The Minister may only consent to a plan or project or adopt or implement the plan or project where he has determined that it will not affect the integrity of the Natura 2000 site.</p>
	Classified Shellfish Production Areas under Regulation (EC) No. 854/2004	Shellfish areas which are classified by the Sea-Fisheries Protection Authority for food safety and consumer protection purposes
Population/ Human Health	Healthy Ireland – a Framework for Improved Health and Wellbeing 2015-2025	The main aims of Healthy Ireland are: to increase the numbers of people experiencing good health (mental and physical) at all life stages; reduce health inequalities with a focus on social factors; protect the public and increase preparedness for threats to public health; and to encourage every individual and society as a whole to collaboratively engage with its own health and wellbeing. The current Implementation Plan published covers 2018-2022
	Ireland's National Action Plan for Antimicrobial Resistance 2017-2020 (iNAP)	iNAP aims to implement policies and actions and to prevent, monitor and combat AMR across the health, agricultural and environmental sector by reducing the inappropriate use of antimicrobial medicines, as well as preventing the transmission of infections and disease. In order to reduce the spread of infection and disease, iNAP identifies implementing the NHWMP priorities as part of its strategic objectives.
Climate/ Energy	Climate Action and Low Carbon Development (Amendment) Act 2021	Amend the Climate Action and Low Carbon Development Act 2015 in order to strengthen the governance framework on climate action by the State.
	Climate Action Plan (CAP) (DECC, 2021)	<p>The CAP sets out ambitious actions across all sectors of society to address climate breakdown. The plan was created in response to the accelerating impact of climate change, as well as other serious issues such as rapid biodiversity loss. A rapid response to reach decarbonisation targets and climate neutrality is emphasised, and sets out a trajectory to meet Ireland's climate targets by 2030, and towards the EU's goal of climate neutrality by 2050.</p> <p>From 2021, the former National Mitigation Plan process has been replaced by annual updates to the CAP. These annual revisions will focus on the short and medium term perspectives; will be aligned with the carbon budget programme; and are to provide a roadmap of actions needed to comply with said budgets and sectoral emission ceilings.</p> <p>An updated plan has been developed for 2021. There are a number of important revised targets, including:</p> <ul style="list-style-type: none"> • An increase in the proportion of renewable electricity to up to 80% by 2030;

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Topic	Title	Summary of Objectives: National
		<ul style="list-style-type: none"> • Commitment to retrofit 500,000 homes by 2030; • Installation of 680,000 renewable energy heat sources in both new and existing residential buildings; • 500,000 extra walking, cycling and public transport journeys per day by 2030; • Increasing the proportion of kilometres driven by passenger electric cars to 40-45% by 2030; • A reduction of 10% in kilometres driven by the remaining internal combustion engine cars; • Replacements for bus and commuter rail vehicles and carriages to be low or zero carbon by 2030; • Increased rollout of rural public transport through Connecting Ireland • For transport sector: 42-50% reduction in emissions by 2030; • For agriculture sector: 22-30% reduction in emissions by 2030; • For land use, land use change and forestry sectors: 37-58% reduction in emissions by 2030; • Circular Economy: reduce food waste by 50%, ensure that all plastic packaging is reusable or recyclable by 2030; increase capacity to recycle packaging waste by 70% and plastic package waste by 55%; • Public sector: reducing emissions by 51% by 2030; 20% remote home working; replacing all buses with electric vehicles by 2035 and tripling the length of electrified rail by 2030.
	National Energy and Climate Action Plan 2021-2030 (NECP) (DECC, 2019)	The 2019 NECP was prepared to incorporate all planned policies and measures that were identified up to the end of 2019. Under the Programme for Government, Our Shared Future, Ireland is committed to achieving a 7% annual average reduction in greenhouse gas emissions between 2021 and 2030. The NECP was drafted in line with the current EU effort-sharing approach, before the Government committed to this higher level of ambition, and therefore does not reflect this higher commitment. Ireland is currently developing those policies and measures and intends to integrate the revision of the NECP into the process which will be required for increasing the overall EU contribution under the Paris Agreement.
	Project Ireland 2040: Investing in the Transition to a Low-Carbon and Climate-Resilient Society 2018-2027 (Department of Expenditure and Reform, 2018)	<p>Project Ireland 2040 includes an investment strategy which outlines the Government's commitment to achieving a low carbon and climate resilient future by 2050. To achieve this, actions must be undertaken to reduce GHG emissions, and resilience entails reducing vulnerability to climate change impacts which are happening now, and what might occur in the future. Project Ireland has committed to an investment of €22 billion towards climate action over the coming decade, with the National Development Plan allocating a further €8.6 billion for investments in sustainable mobility. The Climate Action Fund was also launched in 2018, with €500 million supporting the delivery of projects necessary to achieve the low carbon, climate-resilient transition.</p> <p>The capital investment priorities within this plan represent a major change in Ireland's delivery of climate action objectives. This will provide a big reduction in carbon emissions during the period to 2030. Investment priorities include an additional 3,000-4,500 MW of renewable energy.</p>
	National Policy Position on Climate Action and Low-Carbon Development (2015)	The National Policy Position establishes the fundamental national objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally economy by 2050. It sets out the context for the objective, clarifies the level of GHG mitigation ambition envisaged and establishes the process to pursue and achieve the overall objective.
	Ireland's Transition to a Low Carbon Energy Future 2015-2030 (DCENR White Paper, 2015)	The White Paper is a complete energy policy update, which sets out a framework to guide policy and the actions that Government intends to take in the energy sector from now up to 2030. The paper takes into account European and International climate change objectives and agreements, as well as Irish social, economic and employment priorities. As

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Topic	Title	Summary of Objectives: National
		we progress towards a low carbon energy system, this policy update will ensure secure supplies of competitive and affordable energy to our citizens and businesses.
	Climate Action and Low Carbon Development Act 2015	An Act to provide for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy; to establish a body to be known in the Irish language as <i>An Chomhairle Chomhairleach um Athrú Aeráide</i> or, in the English language, as the Climate Change Advisory Council; and to provide for matters connected therewith.
	National Climate Change Adaptation Framework (DECLG, 2012) and National Adaptation Framework (DCCAE, 2018)	<p>Sets out how Ireland is to meet its adaptation objectives under the Kyoto Protocol. The Strategy sits within the National Climate Change Adaptation Framework which provides the policy context for the national response to achieving the objectives in a strategic manner. The Framework also requires Local Authorities, relevant agencies and Government Departments to prepare and publish draft adaptation plans.</p> <p>With the establishment of the Climate Action and Low Carbon Development Act 2015, there is now a statutory basis on which National Climate Change Adaptation Frameworks and Sectoral Adaptation Plans are to be established. The National Climate Change Adaptation Framework was published in 2018. Under this, a suite of sectoral adaptation plans have been published.</p> <p>The National Adaptation Framework builds on the work already carried out under the National Climate Change Adaptation Framework (NCCAF, 2012). The National Adaptation Framework outlines a whole of government and society approach to climate adaptation in Ireland. It also aims to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector, and the research community.</p>
	Renewable Energy Regulations (S.I. No. 365 of 2020)	On 21 September 2020, these regulations were transposed into Irish law by the Renewable Energy Regulations 2020. The regulations set the parameters for the establishment of future renewable electricity support scheme. The Government pledged that the next competition under the Renewable Electricity Support Scheme will support offshore wind energy and take place in 2021. Investors have reassurance in that the legislation prohibits changes to all renewable energy support schemes.
	Energy Efficiency Regulations (S.I. 426/2014)	These regulations set out several obligations on public bodies with respect to their “exemplary role” for energy efficiency. These include obligations with regard to: Energy efficient procurement; Exemplar energy management practices; Energy audits; Energy services; Use of energy efficient buildings – public bodies may only purchase or lease buildings with Building Energy Ratings of A3 or higher; Maintenance and construction of energy efficient buildings; & Reporting data.
	Strategy for Renewable Energy: 2012-2020 (DCENR, 2012)	This Government policy document covers Ireland's renewable energy policy up to 2020. It contains 36 actions for the country to maximise the economic potential of renewable sources, including the increase of both onshore and offshore wind farm developments, encouraging research and development in wave and tidal power, rolling out smart energy networks and building a sustainable bioenergy sector.
	National Climate Change Strategy 2007-2012	In 2007, the Government published the National Climate Change Strategy 2007-2012, which set out a range of measures, building on those already in place under the 2000 Strategy, to meet Ireland's commitments under the Kyoto Protocol. The Strategy projected a reduction in emissions from the agricultural sector through a number of measures including Common Agricultural Policy Reforms, participation in REPS, AEOS and Organic Schemes, supports for management of manure in line with the EU Nitrates Directive, supports for afforestation, and through development of renewable energy resources.

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Topic	Title	Summary of Objectives: National
	National Energy Efficiency Action Plan (NEEAP) for Ireland #4 2017 - 2020 (DECC, 2017)	Ireland's third National Energy Efficiency Action Plan (NEEAP 3) reaffirmed Ireland's commitment to delivering a 20% reduction in energy demand across the whole of the economy by 2020, along with a 33% reduction in public sector energy use. Each NEEAP outlines the energy efficiency measures that will be implemented to reach the national energy saving targets as well as the progress towards this target. NEEAPs also include information on the exemplary role of the public sector and on provision of information and advice to final customers. The fourth NEEAP was produced in 2017. This report states that just under 12% of the national target of 20% reduction in emissions was achieved by the end of 2016.
	Renewable Energy Feed-In Tariff (REFIT) Schemes 1, 2 and 3	The Renewable Energy Feed in Tariff (REFIT) schemes/supports are funded by the Public Service Obligation (PSO) which is paid for by all electricity consumers. The REFIT schemes have been designed to incentivise the development of renewable electricity generation in order to ensure Ireland meets its goal of 40% of electricity coming from renewable sources by 2020. The last REFIT schemes closed in December 2015. In 2020 REFIT was replaced by the Renewable Electricity Support Scheme (RESS).
	Renewable Electricity Support Scheme (RESS) (DCCAE, 2019)	RESS is the new Renewable Electricity Support Scheme in Ireland (replacing REFIT). RESS will provide financial support to renewable electricity projects in the Republic of Ireland. It is a pivotal component of the National Energy and Climate Plan and is essential for achieving Ireland's 70% renewable electricity target by 2030.
	Renewable Electricity Policy and Development Framework (<i>under development</i>)	To ensure Ireland meets its future needs for renewable electricity in a sustainable manner, the Renewable Electricity Policy and Development Framework will guide the development of renewable electricity projects which are key objectives of Irish energy policy.
	National Renewable Energy Action Plan (NREAP) (2010)	Ireland's NREAP (a requirement of the Renewable Energy Directive) commits to achievement of the 16% RES target for 2020 to be met by 40% from electricity (RES-E), 12% from heat (RES-H), and 10% from transport (RES-T).
	Towards a Sustainable Energy Future for Ireland (SEAI, 2007)	Energy growth in Ireland is predicted to grow by 2-3% annually to 2020, still relying heavily on imported fossil fuels. This policy paper outlines the energy options for Ireland, the government's core goals including sustainability of development, security of energy supply as well as economically and technologic efficiencies.
	European Union (Renewable Energy) Regulations 2014 S.I. No. 483/2014	These regulations pertain to the implementation of Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Elements of the directive are transposed including the provisions relating to access to and operation of the grid; guarantees of origin and the exemplary role of public bodies regarding public buildings.
	Delivering a Sustainable Energy Future for Ireland - The Energy Policy Framework 2007 – 2020 (White Paper, DCMNR, 2007)	This White Paper sets out the Government's Energy Policy Framework 2007-2020 to deliver a sustainable energy future for Ireland. It is set firmly in the global and European context which has put energy security and climate change among the most urgent international challenges. In charting the course for Irish energy policy, the Government is taking full account of global and EU developments. Ireland faces similar energy challenges to those being confronted worldwide. Our situation is made more acute by our small energy market, peripherality and limited indigenous fuel resources. Sustained economic growth and population growth also add to the challenges for Irish energy policy. We have however major opportunities to be realised in harnessing the full potential of our renewable and bioenergy resources. As committed members of the European Union, with specific energy policy objectives, Ireland supports the development of a European Energy Policy which delivers a sustainable energy future for Europe through measures to tackle climate change ensure energy security and enhance competitiveness.
	Offshore Renewable Energy Development Plan (OREDPP)	The OREDPP recognises the opportunity for developing, in a sustainable manner, Ireland's offshore renewable energy resources and sets out the principles, policy actions and enablers for realising this potential. This would lead to an increase in the production of renewable electricity indigenously, which would contribute to greenhouse gas reductions and improve

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Topic	Title	Summary of Objectives: National
	(DCENR, 2014) and Interim Review May 2018	security of energy supply. The Sustainable Energy Authority of Ireland (SEAI) is providing financial support for wave and tidal ocean research, development and demonstration projects.
	Ireland Long Term Renovation Strategy 2017 – 2020 (DECC, 2017)	The Long-Term Renovation Strategy 2020 includes the policies and measures currently in place or in development to encourage and support the renovation of the national building stock to ensure Ireland has a highly energy-efficient and decarbonised building stock by 2050.
	Green Paper on Energy Policy in Ireland (DCENR, 2014)	The Green Paper on Energy Policy in Ireland was launched on 12th May 2014 commencing a public consultation process on the future of energy policy in Ireland for the medium to long-term. That process concluded on 31st July and the Department of Communications, Energy and Natural Resources (DCENR) worked on the analysis of the 1,200 submissions received. On the 24th September 2014 a further Stakeholder Engagement process was launched. This included six special topic seminars on each of the six priority areas and a seventh seminar on energy prices and costs. There were also four regional seminars in Moate, Cork, Sligo and Wexford to facilitate wider engagement of stakeholders.
	National Policy Position on Climate Action and Low Carbon Development - Climate Action and Low Carbon Development Act (2015) and Climate Action and Low Carbon Development (Climate Reporting) Bill 2020 and Climate Action and Low Carbon Development (Emissions Targets) Bill 2020	The National Policy Position establishes the fundamental national objective of achieving transition to a competitive, low carbon, climate-resilient and environmentally economy by 2050. It sets out the context for the objective, clarifies the level of GHG mitigation ambition envisaged and establishes the process to pursue and achieve the overall objective. The Climate Reporting bill is intended to expand the responsibilities of the Government's climate change advisory council to publish guidance to companies on measuring and reporting their exposure to the risks of climate change and their impacts on climate. The Emissions Targets bill intends to specify emissions reduction targets to be achieved and to include these targets in the NMP and NAF.
	Sectoral Adaptation Plans (various, 2015-2018)	Included in the Climate Action Plan are climate adaptation measures to ensure that the State is ready to protect people from the negative effects of climate change in Ireland and steps to limit any damage caused. 12 Sectoral Adaptation Plans including Agriculture, Forestry and Seafood, Transport infrastructure and Electricity and Gas Networks. Each Plan identifies the key risks faced across the sector and the approach being taken to address these risks and build climate resilience for the future.
	Ireland's Greenhouse Gas Emissions Projections for 2019-2040 (EPA, 2020)	The Report on projected Greenhouse Gas Emissions compared two scenarios, one based on current measures and one with additional measures. Although Ireland is set to miss the 2020 EU's effort sharing decision (Decision No 406/2009/EU), projections including the measures adopted by the 2019 Ireland Climate Action Plan are more optimistic for the 2030 targets. Focus is drawn on specific sectors: Energy, Agriculture and Transport as Ireland's main greenhouse gas emission sectors.
	Renewable Electricity Policy & Development Framework (REPDF) (DCCAE) [in development]	To ensure Ireland meets its future needs for renewable electricity in a sustainable manner, the Renewable Electricity Policy and Development Framework will guide the development of renewable electricity projects which are key objectives of Irish energy policy.
	Draft National Bioenergy Plan (DCCAE, 2018)	Aims to develop cost-effective harnessing of sustainable, indigenous, renewable energy resources. Also aims to reduce harmful emissions from traditional fuels. This plan will underpin the development of the sector in the period up to 2020 and lay foundations for its longer term growth and in contributing to renewable energy targets.

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Topic	Title	Summary of Objectives: National
	Bioenergy Roadmap (SEAI, 2010)	Bioenergy demand to 2050 has been forecast using specialist in-house modelling, with the impact of technology development considered to determine the primary bioenergy demand. The main goal of the 2050 model is to indicate the challenges, and the need for action, if we are to achieve the internationally discussed 80% reduction in CO ₂ emissions to curb global warming. What is presented is just one possible scenario of how we can approach this challenge, and the contribution of bioenergy.
	Biofuel Obligation Scheme (BOS) (2010)	The BOS Scheme places an obligation on suppliers of mineral oil to ensure that 8.695% (by volume) of the motor fuels (generally Gasoline and Motor Diesel) they place on the market in Ireland is produced from renewable sources, e.g. Ethanol and Biodiesel. The obligation was increased from the 1st January 2017. It was previously 6.383%. Under the terms of the National Oil Reserves Agency Act 2007 (Returns and Biofuel Levy) Regulations 2010, a Biofuel Levy of 2.00 cent per litre is payable on the sales of all Biofuels into the market with effect from 1st July 2010.
	National Policy Framework for Alternative Fuels in Transport in Ireland 2017-2030 (DTTAS, 2017)	The Department of Transport, Tourism and Sport is tasked with transposing the Alternative Fuels Infrastructure Directive (2014/94/EU). Given the close relationship between transport and energy in this area, the Department is working closely with the Department of Communications, Climate Action and Environment (DCCAE). Ireland's National Policy Framework was published in March 2017 and addresses such infrastructure requirements as Electric Vehicles charging points and natural gas refuelling stations.
	National Oil Reserves Agency Act 2007	This Act provides for the establishment of the National Oil Reserves Agency Limited and sets out its functions, including those in relation to oil stockholding obligations and to impose a levy on relevant disposals of petroleum products.
	Towards Nearly Zero Energy Buildings in Ireland – Planning for 2020 and Beyond (DHLGH, 2012)	Proposed approach to Irish compliance with the EPBD commitments, prepared by the DECLG in November 2012. By 2020 all new dwellings in Ireland will have a Maximum Permitted Energy Performance Coefficient (MPEPC) and Maximum Permitted Carbon Performance Coefficient (MPCPC) of 0.30 and 0.35 in accordance with the common general framework set out in Annex I of EPBD.
	Climate Change Adaptation Plan for the Electricity and Gas Networks Sector (DCCAE, 2018)	A high-level plan which outlines the initial research and analysis on the likely effects of climate change on these sectors and sets out possible actions to develop resilience.
	Code of Practice for Wind Energy Development in Ireland - Guidelines for Community Engagement (DCCAE, 2016)	This Code of Good Practice is intended to ensure that wind energy development in Ireland is undertaken in observance with the best industry practices, and with the full engagement of communities around the country.
	Wind Energy Development Guidelines 2006 (DEHLG) and Draft Revised Wind Energy Guidelines (DHPLG, 2019)	Draft Revised Wind Energy Development Guidelines, replacing the previous Guidelines which were in place since 2006. The guidelines which were out to public consultation until February 19 th , 2020, set out how wind energy is to be delivered in accordance with best practice and in particular, in partnership with people living in areas local to proposed developments. The guidelines, together with the Climate Action Plan, provide a roadmap as to how Ireland's 2030 climate commitments can be met and ultimately move the country towards a position of net zero emissions by 2050.
Planning	Project Ireland 2040 (Department of Finance and Public Expenditure and Reform, 2017)	Project Ireland 2040 is the government's long-term overarching strategy to make Ireland a better country for all of its people. The National Development Plan and the National Planning Framework combine to form Project Ireland 2040. The National Planning Framework (NPF) sets the vision and strategy for the development of our country to 2040 and the National Development Plan (NDP) provides enabling investment to implement the strategy.

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Topic	Title	Summary of Objectives: National
	Ireland 2040 Our Plan: The National Planning Framework (Department of Housing, Local Government and Heritage, 2017)	The new framework document will be the successor to the National Spatial Strategy 2002 (NSS) and will be known as the National Planning Framework (NPF). The National Planning Framework will be the long-term, 20 year strategy for the spatial development of Ireland that will promote a better quality of life for all, with sustainable economic growth and an environment of the highest quality as key underlying principles.
	Project Ireland 2040: National Development Plan 2018 – 2027 (Department of Finance and Public Expenditure and Reform, 2017)	The Plan sets out the investment priorities that will underpin the implementation of the National Planning Framework, through a total investment of approximately €116 billion. Major national infrastructure projects for appraisal and delivery under the umbrella of “Transition to a Low-Carbon and Climate-Resilient Society” include Climate Action Fund, New Renewable Electricity Support Scheme and Conversion of Moneypoint electricity generation plant to end the burning of coal.
	Capital Investment Plan 2016-2021 (DPER, 2015)	On 29 September 2015 the Government announced its capital spending plan which is a high level budgetary and finance document worth an estimated €27 billion in direct investment by the Exchequer over 6 years. This amounts to an average of €4.5 billion per year and is expected to create in the region of 45,000 jobs during the construction phase. Following public consultation, a review of the plan is expected to be published in 2017 and a new ten year plan to be published before end of 2017.
	Planning and Development Act (as amended) and the Planning and Development Regulations (S.I. 600/2001)	Revised and consolidated law relating to planning and development by repealing and re-enacting with amendments the Local Government (Planning and Development) Acts, 1963 to 1999; to provide, in the interests of the common good, for proper planning and sustainable development including the provision of housing; to provide for the licensing of events and control of funfairs; to amend the Environmental Protection Agency Act 1992, the Roads Act 1993, the Waste Management Act 1996 (as amended), and certain other enactments.
	Planning and Development (Strategic Infrastructure) Act 2006	An act to provide for the making directly to An Bord Pleanála of applications for planning permission in respect of developments of strategic importance to the State.
	Rural Development Programme 2014-2020 (DAFM, 2015)	The Rural Development Programme (RDP) is part of the Common Agricultural Policy (CAP), a common set of objectives, principles and rules through which the European Union (EU) co-ordinates support for European agriculture. The CAP framework is comprised of two complementary pillars; Pillar 1 deals with direct payments to farmers and market measures while Pillar 2 covers multi-annual rural development measures which include those that are beneficial for the environment and climate change.
	The Planning System and Flood Risk Management Guidelines (DHPCLG, 2009)	The flood risk guidelines were issued under Section 28 of the Planning and Development Act 2000 (as amended), and sets out that development plans and local area plans, must establish the flood risk assessment requirements for their functional area. Flood risk assessment is required by planning authorities to be an integral and leading element of their development planning functions. The guidelines are specifically aimed at linking planning and development with flood protection and flood risk assessment and recommend a clear and transparent assessment of flood risk at all stages in the planning process. It is a requirement of the guidelines that Plans and all future planning decisions have regard to the guidelines.
	Environmental Protection Agency Act 1992	An Act to make further and better provision for the protection of the environment and the control of pollution, to establish an Environmental Protection Agency, for these and other purposes to increase certain existing monetary penalties and to provide for other matters connected with the matters aforesaid.
	Planning for Watercourses in the Urban Environment - Guidelines (IFI, 2020)	This guideline document outlines an integrated watercourse protection strategy, developed by Inland Fisheries Ireland through consultation with a wide range of experts in the area. It sets out guidelines for the protection of watercourses

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Topic	Title	Summary of Objectives: National
		through the use of buffer zones, sustainable drainage systems, instream rehabilitation, climate and flood risk and recreational planning.
	Planning and Development Guidance Recommendations for Utility Scale Solar Photovoltaic Schemes in Ireland (Future Analytics, funded by the SEAI, October 2016)	This report contains a set of planning policy and development guidance recommendations for utility scale solar photovoltaic schemes in Ireland.
	Interim Guidelines for Planning Authorities on Statutory Plans, Renewable Energy and Climate Change (DPCLG, 2017)	These Guidelines focus on administrative procedures which should be carried out by planning authorities in the context of any review or variation to a development plan that may arise in the interim.
	National Marine Planning Framework (NMPF) (Department of Housing Local Government and Heritage, 2020)	A marine spatial plan which sets out over a 20 year horizon, how we want to use, protect and enjoy our seas. The NMPF sets out planning objectives and policies relating to 16 different sectors / activities including offshore renewable energy. For offshore renewables a preference will be given to offshore wind farms, including enabling projects and infrastructure, in areas identified as designated zones for offshore wind under the zoning process to be set out in the much-anticipated Marine Planning and Development Management Bill.
Sustainable Development	The Protection of the Environment Act 2003	Act implementing Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control and certain other Acts adopted by the institutions of the European Communities. Amends the Environmental Protection Agency Act 1992, Waste Management Act 1996, and Litter Pollution Act 1997.
	Environmental Liability Regulations, S.I. 547/2008	These Regulations (SI 547 of 2008) transpose EU Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage.
	Green Procurement Guidance for the Public Sector (EPA, 2014)	The EPA produced guidance to help inform public bodies by giving a practical overview across eight priority sectors of green procurement issues. It includes best practice and examples, along with the key environmental impacts to be considered in procurement and how the guidance criteria can address these.
	State of the Environment Report (EPA, 2020)	This report is the latest in the EPA State of the Environment series, which is published every 4 years. The report outlines at a strategic level the current state of Ireland's environment. It provides an update on environmental challenges that we face both nationally and globally. The report adds to the range of thematic and research reports available from the EPA that cover many of the issues reported on in further detail. To complement this report the EPA has developed the "Ireland's Environment" section on the EPA website which provides up-to-date online information that includes environmental indicator data.
	National Sustainable Development Policy	Under the terms of "Towards 2016", the current Social Partnership Agreement, the Government is committed to publishing a renewed National Sustainable Development Strategy in 2007. The Sustainable Development Unit is co-ordinating the preparation of this Strategy. The renewed Strategy will replace the first National Sustainable Development Strategy, "Sustainable Development – A Strategy for Ireland", published in 1997, and "Making Ireland's Development Sustainable", published in 2002.

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Topic	Title	Summary of Objectives: National
	Food Vision 2030 Strategy (DAFM, Aug. 2021)	This strategy is the successor to Food Wise 2025. It has 22 goals grouped under four missions: <ol style="list-style-type: none"> 1. A Climate Smart, Environmentally Sustainable Agri-Food Sector 2. Viable and Resilient Primary Producers with Enhanced Well-Being 3. Food Which is Safe, Nutritious And Appealing, Trusted And Valued at Home and Abroad 4. An Innovative, Competitive and Resilient Agri-Food Sector, Driven by Technology And Talent
	Food Wise 2025	Food Wise sets out the strategic plan for the development of the Irish agri-food sector over the next decade. Growth projections include increasing the value added in the agri-food, fisheries and wood products sector by 70% to in excess of €13 billion. Sustainable production at its core setting out a range of specific recommendations aimed at managing the projected growth in a sustainable way. There is a strong commitment to the measurement and monitoring of the sustainability credentials of the sector as the strategy rolls out.
	Forest Policy Review - Forests, products and people - Ireland's forest policy (a renewed vision) (DAFM)	The forerunner to this document was <i>Growing for the Future</i> (1996). Substantial changes in the forest sector have occurred since then leading to a revision and the publication of a 'Renewed Vision'. The strategic goal of this vision is stated as: " <i>To develop an internationally competitive and sustainable forest sector that provides a full range of economic, environmental and social benefits to society and which accords with the Forest Europe definition of sustainable forest management</i> ". The document sets out a summary of recommended policies and actions.
	Forestry Programme 2014-2020 (DAFM, 2015)	The document sets out the state aid funding programme for forestry for the period 2014-2020. Four needs were identified in preparing the proposal, namely: to increase forest cover in Ireland in order to capture carbon, produce wood and help mitigation; to increase in a sustainable way enough biomass to help in meeting renewable energy targets; support to forest holders in the management of their plantations; and to optimise the benefits, environmental and social, of forest. A number of schemes and measures are proposed in order to meet these needs, such as the Neighbour Wood Scheme and Native Woodland Conservation. The total cost of the programme is estimated at €666m for the period 2015 – 2020 (2014 is covered under the previous programme).
	Afforestation Grant and Premium Scheme (DAFM, 2015)	The Afforestation Grant and Premium Scheme aims to increase the area under forest in Ireland from its current low base of 11% (EU average is 38%). This will be undertaken in a sustainable manner contributing towards the EU's priority for "Restoring, preserving and enhancing ecosystems related to agriculture and forestry".
	European Communities (Environmental Assessment of Certain Plans and Programmes Regulations 2004, (S.I. 435 of 2004) as amended by S.I. 200 of 2011	These regulations transpose the SEA Directive into Irish law, covering 'Other Plans and Programmes.'
	Environmental Impact Assessment Regulations (S.I. 349/1989) (as amended)	The Regulations modify the provisions of the Local Government (Planning and Development) Acts, 1963 to 1983 so as to provide a framework for the application of Environmental Impact Assessment (EIA) to the planning control procedures under those Acts, and for the application of EIA to relevant development by local authorities. They also modify development consent procedures under 9 other enactments in light of the Directive's requirements, and they establish an EIA procedure for relevant development by State authorities. The Regulations specify, in the First and Second Schedules respectively, the development for which EIA will be required and the information which must be furnished in an environmental impact statement prepared in connection with proposed development

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Topic	Title	Summary of Objectives: National
	Programme for Government - Our Shared Future (department of the Taoiseach, 2020)	Contains a number of key policy commitments on climate change, including a legal target of an average of a 7% reduction in carbon emissions per annum from 2021 to 2030. A future proposal for a target of net zero emissions by 2050. It reports taking advantage of a potential of at least 30GW of offshore floating wind power in our deeper waters in the Atlantic. There will be no new issuing of licenses for gas exploration and extraction, and a ban on the import of fuels derived from fracking.
	National Policy Statement on the Bioeconomy (May 2018)	The first National Policy Statement on the Bioeconomy recognises the bioeconomy as crucial for decarbonisation, sustainability and circularity while also providing an impetus to competitiveness and rural and regional development and employment.
	Our Sustainable Future: A Framework for Sustainable Development in Ireland (2012)	This framework takes account of developments at international and EU level designed to deliver an effective transition to an innovative, low carbon and resource efficient future. It has followed the model used in the EU Sustainable Development Strategy, which focuses on identifying key gaps where progress has been limited since the 1997 National Sustainable Development Strategy and it aims to set out a range of measures to address the outstanding challenges.
	Building Ireland's Smart Economy – a framework for sustainable economic renewal (Department of the Taoiseach, 2008)	This Framework for Sustainable Economic Renewal sets out the Government's vision for the next phase of Ireland's economic development. This document sets out an ambitious set of actions to develop Ireland's Smart Economy.
Transport	National Investment Framework for Transport in Ireland (NIFTI)	<p>The NIFTI is the Department's high-level strategic framework for prioritising future investment in the land transport network, and establishes high-level investment priorities to address key transport challenges. The public consultation commenced in March 2021 and concluded in May 2021.</p> <p>It represents the department's contribution to Project Ireland 2040 and has been developed to ensure that sectoral transport strategy is underpinned by and supports the achievement of the objectives set out in the National Planning Framework.</p>
	National Transport Authority Integrated Implementation Plan 2013-2018	In accordance with Section 13 (1) of the Dublin Transport Authority Act 2008, an Integrated Implementation Plan has been prepared for the Greater Dublin Area. The Plan sets out the NTA's programme of investment and development in the Greater Dublin Area for the period 2013-2018. The Plan provides the framework for a capital and operational investment amounting to almost €900 million and is comprised of: an infrastructure investment programme; identification of the key objectives and outputs to be pursued by the NTA; relevant actions to be taken to ensure effective integration of public transport; and an integrated services plan.
	Smarter Travel – A Sustainable Transport Future, 'A New Transport Policy for Ireland' 2009-2020	<p>Smarter Travel aims to encourage consideration of travel choices and sets out the strategic vision of achieving sustainable travel and transport system. The Smarter Travel programme also provides funding to provide information and improve facilities for cyclists, p and public transport users.</p> <p>As an Action Plan developed by the Government, it has been designed to show how we can reverse current unsustainable transport and travel patterns and reduce the health and environmental impacts of current trends and improve our quality of life. It sets out five key goals: to reduce overall travel demand; to maximise the efficiency of the transport network; to reduce reliance on fossil fuels; to reduce transport emissions; and to improve accessibility to transport. In order to achieve these goals the policy establishes targets, outlines the forty nine actions to be undertaken and details the funding which must be secured. It will be the role of the Framework to secure the funding necessary to continue to implement key remaining actions.</p>

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Topic	Title	Summary of Objectives: National
	Investing in our Transport Future: A Strategic Framework for Integrated Land Transport	Investing in our Transport Future is an integrated, evidence-based framework which establishes the overall principles guiding expenditure decisions in transport. It outlines the business case for investment in transport infrastructure including road, heavy and light rail, pedestrian and cycle facilities. This land transport funding framework is required for delivering projects based on policy in the context of exchequer funds. The Framework will guide key land transport investment decisions based on a number of identified priorities, however, it does not set out a list or identify specific projects to be prioritised.
Water/ Wastewater	River Basin Management Plan (RBMP)	A key development in meeting the requirements of the Water Framework Directive has been the publication of River Basin Management Plans. The plans implement the objectives of the Water Framework Directive. The aim is to achieve good water quality status in all waterbodies by 2015, through the implementation of a programme of Measures (POM). The Minister for the Environment, Community and Local Government has put in place new governance structures and administrative arrangements for the implementation of a second cycle of River Basin Management Plans and this will change the context for future reporting on water quality in Ireland. The existing seven River Basin Districts are to be reconfigured into three RBDs. The second cycle of RBM plans cover the period 2017-2021. The third cycle plan is in development and will cover the period to 2027.
	Water Services Strategic Plan (Irish Water, 2015)	Irish Water has prepared a Water Services Strategic Plan (WSSP, 2015), under Section 33 of the Water Service No. 2 Act of 2013 to address the delivery of strategic objectives which will contribute towards improved water quality and WFD requirements. The WSSP forms the highest tier of asset management plans (Tier 1) which Irish Water prepare and it sets the overarching framework for subsequent detailed implementation plans (Tier 2) and water services projects (Tier 3). The WSSP sets out the challenges we face as a country in relation to the provision of water services and identifies strategic national priorities. It includes Irish Water's short, medium and long term objectives and identifies strategies to achieve these objectives. As such, the plan provides the context for subsequent detailed implementation plans (Tier 2) which will document the approach to be used for key water service areas such as water resource management, wastewater compliance and sludge management. The WSSP also sets out the strategic objectives against which the Irish Water Capital Investment Programme is developed. The current version of the CIP outlines the proposals for capital expenditure in terms of upgrades and new builds within the Irish Water owned asset.
	Water Services Policy Statement 2018–2025 (Irish Water, 2018)	<p>The statement clarifies the government's expectations for the delivery and development of water and wastewater services for the coming years, and will also inform decisions on rural water services. It represents the first Policy Statement prepared under the Water Services Act 2017. It outlines four principles:</p> <ul style="list-style-type: none"> • A single, publicly-owned, national water services authority; • Fair and efficient delivery with a customer focus; • Priority health and environmental quality outcomes across the sector; and • Ways of working to support partnership and excellent stakeholder engagement. <p>It also sets out three themes of high-level objectives comprising:</p> <ul style="list-style-type: none"> • Quality; • Conservation; and • Future-proofing.

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Topic	Title	Summary of Objectives: National
	Irish Water Strategic Funding Plan (2019–2024)	Under the Water Services Act 2017, Irish Water must prepare a Strategic Funding Plan (SFP) to the Minister within three months of the publication of the WSPS. This SFP covers the principles, themes and policy objectives identified in the WSPS and the strategic objectives outlined in the Water Services Strategic Plan. It outlines the operational and capital costs associated with the arrangements that Irish Water proposes to make and measures that it intends to take to implement the objectives of the WSSP. The strategic funding requirement is €11bn to 2024, comprised of a €6.1bn investment in infrastructure and assets and €4.9bn in operating costs. The funding model for Irish Water is set in context of
	Water Services Strategic Plan (Irish Water, 2015)	Irish Water has prepared a Water Services Strategic Plan (WSSP), under Section 33 of the Water Service No. 2 Act of 2013 to address the delivery of strategic objectives which will contribute towards improved water quality and WFD requirements. The WSSP forms the highest tier of asset management plans (Tier 1) which Irish Water prepare and it sets the overarching framework for subsequent detailed implementation plans (Tier 2) and water services projects (Tier 3).
	National Strategy to Reduce Exposure to Lead in Drinking Water – Irish Water Lead in Drinking Water Mitigation Plan	Irish Water has developed and implemented a Lead Strategy which aims to reduce the potential for dissolved lead from pipework to enter drinking water to and to replace public lead water mains over a ten year period. This will involve dosing public water supplies with orthophosphate. Orthophosphate works as a corrosion inhibitor by converting some of the lead carbonate to lead phosphate, forming a protective coating inside lead pipes, reducing corrosion which is a contributor of lead to the water supply.
	National Wastewater Sludge Management Plan (Irish Water)	The National Wastewater Sludge Management Plan (NWSMP) is a national plan for the management of sludges arising primarily from facilities under the control of Irish Water. As such the assessment is focussed at a national strategic level.
	Wastewater Compliance Strategy (<i>to be prepared</i>)	Irish Water is proposing to prepare and implement a Wastewater Compliance Strategy which would aim to improve management of the wastewater systems. This will seek to address unacceptable discharges through improvements to treatment and remediate problems associated with combined sewers, where feasible.
	Waste Water Discharge (Authorisation) Regulations (S.I. 684/2007)	This has been derived from the Dangerous Substances Directive 2006/11/EC, to address pollution caused by certain toxic substances that are discharged to the aquatic environment and to establish a framework for Community action in the field of water policy.
	Urban Wastewater Treatment Regulations (S.I. 254/2001)	The Urban Wastewater Treatment Directive was transposed into Irish law by the Urban Wastewater Treatment Regulations (S.I. 254/2001).
	National Water Sludge Management Plan (Irish Water)	A national water sludge management plan developed by Irish Water as a national plan for the management of sludges arising primarily from facilities under the control of Irish Water. As such the assessment is focussed at a national strategic level.
	Assessment and Management of Flood Risks Regulations (S.I. 122/2010)	The directive was transposed into Irish law by the European Communities (Assessment and Management of Flood Risks) Regulations (S.I. 122/2010). The Regulations set out the responsibilities of the OPW and other public bodies in the implementation of the Directive. With trends such as climate change and increased domestic and economic development in flood risk zones, this poses a threat of flooding in coastal and river basin areas.
	Freshwater Pearl Mussel Catchment Management Plans for Forestry (in preparation)	The development of procedures is currently underway to ensure that forestry activities undertaken within all 27 freshwater pearl mussel catchments (including the Priority 8 catchments) are compatible with the conservation of the species.

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Topic	Title	Summary of Objectives: National
	European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2014 (S.I. 31/2014)	<p>These Regulations give effect to Ireland's Nitrates Action Programme, provide statutory support for good agricultural practice to protect waters against pollution from agricultural sources and include measures such as-</p> <ul style="list-style-type: none"> • Periods when land application of fertilisers is prohibited; • Limits on the land application of fertilisers; • Storage requirements for livestock manure; and • Monitoring of the effectiveness of the measures in terms of agricultural practice and impact on water quality. • The Regulations give further effect to several EU Directives including Directives in relation to protection of waters against pollution from agricultural sources ("the Nitrates Directive"), dangerous substances in water, waste management, protection of groundwater, public participation in policy development and water policy (the Water Framework Directive).
	Ireland's Nitrates Action Programme (NAP)	<p>Ireland's first Nitrates Action Programme (NAP) came into operation in 2006 and gave effect to the Nitrates Directive. The NAP was given effect through a series of regulations, most recently the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2014 (S.I. No. 31 of 2014), known as the Nitrates Regulations.</p> <p>The aim of the NAP is to prevent pollution of surface waters and groundwater from agricultural sources and to protect and improve water quality. In accordance with the Nitrates Directive and Article 28 of the Good Agricultural Practice Regulations, the Minister for Housing, Planning and Local Government, in consultation with the Minister for Agriculture, Food and the Marine reviewed the NAP for the first time in 2010. Article 28 of the Nitrates Regulations, in line with the Nitrates Directive, requires a review of the NAP every four years. Ireland's fourth NAP will run until the end of 2021.</p>
	Drinking Water Regulations (S.I. 122/2014)	The Drinking Water Regulations S.I. 122/2014 provides the EPA with supervisory powers for public water supplies.
	Water Policy Regulations (S.I. 350/2014)	These Regulations provide for the establishment and composition of a Water Policy Advisory Committee and related procedural and ancillary matters. The Regulations also transfer certain local authority responsibilities provided for in the European Communities (Water Policy) Regulations 2003 to the Environmental Protection Agency and to the Minister for the Environment, Community and Local Government.
	The Water Policy Regulations (S.I. 722/2003), Environmental Objectives (Surface Water) Regulations (S.I. 272/2009) and Groundwater Regulations (S.I. 9/2010)	<p>The Water Policy Regulations (S.I. 722/2003), Environmental Objectives (Surface Water) Regulations (S.I. 272/2009) and Groundwater Regulations (S.I. 9/2010) govern the shape of the WFD characterisation, monitoring and status assessment programmes in terms of assigning responsibilities for the monitoring of different water categories, determining the quality elements and undertaking the characterisation and classification assessments.</p> <p>The Surface Water Regulations institute a wide-ranging set of environmental standards for Irish surface waters. The Groundwater Regulations establish environmental objectives to be achieved in groundwater bodies and include groundwater quality standards and threshold values for the classification of groundwater and the protection of groundwater against pollution and deterioration in groundwater quality.</p>
	European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 (S.I. 296/2009)	The Regulations require the EPA, when classifying surface waters in accordance with the ecological objectives approach of the Water Framework Directive, to assign a status of "less than good ecological status" where Margaritifera is found to be in unfavourable conservation status. This will trigger further actions as waters classified as less than good must be restored to at least good status within a prescribed timeframe.

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Topic	Title	Summary of Objectives: National
	Foreshore Act (as amended) 1933-2011	The foreshore is classed as the land and seabed between the high water of ordinary or medium tides and the twelve nautical mile limit. Under the Foreshore Act, a lease/licence must be obtained from the Minister for Agriculture, Food and the Marine for certain works undertaken on the foreshore which are deemed to be in relation to a fishery harbour centre or any function relating to: the use, development or support of aquaculture; or an activity involved in the use, development or support of sea-fishing including the processing and sale of sea-fish and manufacture of products derived from sea-fish.
	Quality of Bathing Waters Regulations 1988 (S.I. 84/1988) as amended	These Regulations prescribe bathing water quality standards and the bathing areas to which they apply, together with the sampling programmes and the methods of analysis and inspection to be used by local authorities to determine compliance with the standards. The Regulations give effect to Council Directive No. 76/160/EEC of 8 December, 1975 (O.J. No. L31/1,5 February, 1976) concerning the quality of bathing water.
	European Communities (Quality of Shellfish Waters) Regulations 2006 (S.I. 268/2006)	The Shellfish Waters Directive was transposed into legislation in Ireland by the European Communities (Quality of Shellfish Waters) Regulations 2006 (S.I. 268/2006), which were subsequently amended by the European Communities (Quality of Shellfish Waters) (Amendment) Regulations 2009 (S.I. 55/2009).
	Local Government (Water Pollution) Act, 1977 (Water Quality Standards for Phosphorus) Regulations 1998 (S.I. 258/1998)	These Regulations provide for specified improvements in water quality conditions in rivers and lakes based on phosphorus concentrations or related water quality classifications. The Regulations also provide for periodic reporting in relation to progress in implementing the requirements of the Regulations. These Regulations give effect to certain requirements arising under Council Directive 76/46/EC on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community.
	Marine Strategy Framework Regulations S.I. 249/2011	The Marine Strategy Framework Directive (MSFD) was transposed onto Irish law under the Marine Strategy Framework Regulations S.I. 249/2011.
	Irish Coastal Protection Strategy Study	The Irish Coastal Protection Strategy Study (ICPSS) was commissioned as a national study in 2003 with the aim of providing information to aid decision-making at a strategic level regarding the issues of coastal flooding and coastal erosion, and to inform planning and development in and around coastal areas. Phase 1 of the study was completed in 2013 and contains strategic coastal erosion maps and flood hazard maps for the present scenario and looking forward to the future (to 2100). Phases 2, 3, 4 and 5 have now been completed covering the South East Coast, North East & South Coast, South West & West Coast, and North West Coast.
	Irish Water's Capital Investment Programme 2020-2024 (Irish Water, 2019)	In 2019, Irish Water published its Investment Programme covering the period 2020-2024. Investment priorities are set out for where improvements are needed urgently, and cover drinking water quality, leak reduction, water availability and wastewater compliance, efficiencies and customer service.
	Blue Dot Catchments Programme	This programme was established as one of the key measures of the RBMP 2018-2021, to achieve the objectives of the EU Water Framework Directive. The programme specifically targets the maintenance and restoration of high status water bodies and aims to address their decline in Ireland.
	Harnessing Our Ocean Wealth - An Integrated Marine Plan for Ireland (Inter-Departmental Marine Coordination Group, 2012)	Ireland aims to have the ocean become a key component for economic recovery and sustainable growth. As a national asset the potential of the Irish Sea is seen as something to be harnessed as outlined in Harnessing our Ocean Wealth an Integrated Marine Plan for Ireland 2012. Three high-level goals have been developed: Ireland will utilise market opportunities to improve the maritime economy and create sustainable growth; Improve the health of the sea ecosystems for economic benefit, and goods and services such as food, climate, health and well-being; and Encourage engagement with the sea to increase awareness of its value. There are two key targets: Double the value of our ocean wealth to 2.4% of GDP by 2030; and increase the turnover from our ocean economy to exceed €6.4bn by 2020.

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Topic	Title	Summary of Objectives: National
Air	Industrial Emissions Regulations (S.I. 138/2013)	These Regulations primarily amend the Environmental Protection Agency Act 1992 and the Waste Management Act 1996 to transpose Chapters II and VI of Directive 2010/75/EC of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast). The Regulations apply to the industrial emissions directive activities specified in the First Schedule to the Environmental Protection Agency Act 1992, as amended by these Regulations.
	Air Quality Standards Regulations 2011 (S.I. 180/2011)	These Regulations transpose the Directive on ambient air quality and cleaner air for Europe (CAFE) into Irish law. They introduce a limit value to PM _{2.5} in addition to the existing limit values for PM ₁₀ , nitrogen dioxide and oxides of nitrogen, sulphur dioxide, lead, ozone, carbon monoxide and benzene.
	Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58 of 2009).	The Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) was published in May 2008. It replaced the Framework Directive and the first, second and third Daughter Directives. The fourth Daughter Directive (2004/107/EC) will be included in CAFE at a later stage. The limit and target values for both Directives are outlined below. The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. 180/2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. 53/2004) and S.I. 33/1999. The fourth Daughter Directive was transposed into Irish legislation by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. 58/2009).
	Mercury Regulations 2018 (S.I. 533/2018)	These regulations transpose the EU Regulation 2017/852 on mercury into Irish Law. These regulations seek to protect human health and the environment by laying down measures and conditions concerning the use and storage of and trade in mercury, mercury compounds and mixtures of mercury, and the manufacture and use of and trade in mercury-added products, and the management of mercury waste, in order to ensure a high level of protection of human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds.
	National Clean Air Strategy (DCCAE) (<i>in prep</i>)	With improvement in the scientific knowledge of the threats posed to people's health and the environment by air pollutants, it is now clear that air pollution causes more damage than previously understood. The DCCAE are therefore currently developing a national Clean Air Strategy. Establishing a National Strategy will provide a policy framework by which Ireland can develop the necessary policies and measures to comply with new and emerging EU legislation, as well helping to tackle climate change. The Strategy will also necessarily consider a wider range of national policies that are relevant to clean air policy such as transport, energy, home heating and agriculture. In any discussion relating to clean air policy, the issue of people's health is paramount and this will be a strong theme of the Strategy.
	Persistent Organic Pollutant Regulations 2020 (S.I. 146/2020)	These Regulations give statutory effect in Ireland to Regulation (EU) 2019/1021 on persistent organic pollutants (the EU POPs Regulation). The EC Regulation is intended to ensure coherent and effective implementation of the European Community's obligations under the 2001 Stockholm Convention on Persistent Organic Pollutants and the 1998 Protocol on Persistent Organic Pollutants to the 1979 UNECE Convention on Long-Range Transboundary Air Pollution.
Waste	Waste Management (Amendment) Act 2001	Objectives include (amongst others) the more effective and environmentally sensitive management of wastes in Ireland.
	The National Strategy on Biodegradable Waste (DEHLG, 2006)	The National Strategy on Biodegradable Waste was published in April 2006 and set out measures to progressively divert biodegradable municipal waste from landfill in accordance with the agreed targets in EU Directive 1999/31/EC on the landfill of waste.

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Topic	Title	Summary of Objectives: National
	Waste Management Act 1996 (as amended) and the European Communities (Waste Directive) Regulations 2011 (S.I. 323 of 2011 & S.I. 126 of 2011)	The Waste Framework Directive sets out the approach for the sustainable management of waste in the Member States of the European Community and this has been transposed into Irish law by the Waste Management Act 1996 and the European Communities (Waste Directive) Regulations 2011. This legislation requires the preparation of a regional waste management plan for all regions within the state.
	Draft Whole of Government Circular Economy Strategy 2021-2022	This was published in April 2021. This strategy acknowledges that climate action requires reducing consumption of natural resources which also has benefits for better sustainability and reduction of environmental pressures associated with extraction, manufacturing, and disposal of products and waste.
	Waste Action Plan for a Circular Economy (DECC, 2020)	This new Waste Action Plan was published as a key action under the Programme for Government. It builds on A Resource Opportunity as the previous waste management policy for Ireland, and takes on board the changes in waste management and legislation that have occurred since. It aligns with the EU Green Deal and the EU Circular Economy Action Plan, on the need to drive transition to a circular economy, as well as embedding climate action. Ireland's Action Plan contains over 200 actions across the different areas of waste and waste management.
	National Waste Management Plan for a Circular Economy [in prep.]	The preparation of Regional Waste Management Plans (RWMPs) are a requirement of the Waste Management Act, as amended. The three RWMPs for the Eastern-Midlands Regional, Southern Region and Connaught-Ulster Region were published in 2015 and cover the period to 2021. As part of the next review cycle, the three RWMPs will be consolidated into one national plan which is due for preparation starting in 2021, and will continue to be supported and implemented by the three Regional Waste Management Authorities.
	National Waste Prevention Programme NWPP (EPA)	The NWPP is a government initiative which is led by the EPA. It supports national programmes and aims to encourage sustainability and circularity, and targets funding at programmes that support these aspects. Reports are published annually. The NWPP is preparing Sectoral Sustainability Factsheets and Case Studies for businesses and enterprises. The NWPP will link up with the Circular Economy Programme, published as a consultation draft in 2021.
	Fourth National Hazardous Waste Management Plan 2021-2027 (EPA) [in draft]	The EPA has published the draft Fourth National Hazardous Waste Management Plan which sets out priorities to improve the management of hazardous waste in Ireland. Their priority actions include in the first instance the prevention of hazardous waste. In addition, the plan seeks to improve Ireland's self-sufficiency for the management hazardous waste and continued identification and regulation of legacy issues, such as the remediation of historic unregulated waste disposal sites. A key aspect of the plan is the continuation of prevention projects to reduce the generation of hazardous waste in certain priority sectors, led by the EPA through the National Waste Prevention Programme including coordination with other authorities and agencies.
	European Union (Household Food Waste & Bio-Waste) Regulations 2015 (S.I. 430 of 2015)	These Regulations are designed to promote the segregation and recovery of household food waste. They will, in particular, contribute to the achievement of the targets set out in article 5 of EU Directive 99/31/EC on the landfill of waste for the diversion of biodegradable municipal waste from landfill sites to composting and biogas plants and to other forms of authorised treatment. They will also increase the amount of food waste that is recovered.
	Waste Management (Landfill Levy) Regulations 2015 (S.I. 189 of 2015)	These Regulations replace the Waste Management (Landfill Levy) Regulations 2011. They make provision for the continued operation of the landfill levy provided for under section 73 of the Waste Management Act 1996 and make some amendments to application of the levy.

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) ENVIRONMENTAL REPORT (ER)

Topic	Title	Summary of Objectives: National
	Waste Management (Food Waste) Amendment Regulations 2015 (S.I. 190 of 2015)	These Regulations amend the Waste Management (Food Waste) Regulations 2009 (S.I. 508/2009) and are designed to promote the segregation and recovery of food waste arising in the commercial sector and to take account of the advent of "Type 8" plants in Ireland providing for the successful coexistence of these and composting plants within the overall waste treatment infrastructure in Ireland.
	Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009)	These Regulations are designed to promote the segregation and recovery of food waste arising in the commercial sector. They will facilitate in particular the achievement of the targets set out in Directive 99/31/EC on the landfill of waste for the diversion of biodegradable municipal waste from landfill sites to composting and to other forms of authorised treatment. They will also increase the amount of food waste that is recovered.
	The Environment (Miscellaneous Provisions Act 2015 (No. 29 of 2015))	An Act to make provision for transfer of certain functions under the Bourn Vincent Memorial Park Act 1932 to the Minister for Arts, Heritage and the Gaeltacht; to amend and extend the Finance (Excise Duties) (Vehicles) Act 1952, the Air Pollution Act 1987, the Environmental Protection Agency Act 1992, the Waste Management Act 1996, section 6 of the Local Government Act 1998; to amend the Water Services Act 2007, the Water Services (No. 2) Act 2013 and the Water Services Act 2014; to amend other Acts and to provide for related matters.
	Waste Management (Use of Sewage Sludge in Agriculture) (Amendment) Regulations (S.I. 267/2001).	These Regulations amend the Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 (S.I. 148/1998) by replacing the two tonne per hectare per year limit on the amount of dry matter to be added to soil, with limits based on absolute quantities of specified heavy metals which may be introduced into soil per hectare per year subject to the carrying out of nutrient management plans. The regulations also require that sludge is used in accordance with a nutrient management plan and provide for the inclusion of additional technical parameters to be entered in the sludge register provided for in the 1998 Regulations.
	Waste Statistics Regulation (2150/2002/EC, as amended)	The EU has created a framework for the production of statistics on the generation, recovery and disposal of waste. This regulation permits the gathering of regular and comparable data in EU countries and their transmission to Eurostat. The statistics collected allow the EU waste policy implementation to be monitored and evaluated.
Landscape	National Landscape Strategy 2015-2025	<p>Objectives are to provide a cross-sector approach at government level to plan and manage the landscape (rural and urban) alongside communities and stakeholders. An implementation programme is included in the Landscape Strategy and will take place over the duration of the strategy period. The key objectives of the strategy are:</p> <ul style="list-style-type: none"> • To recognise landscapes in law; • The provision of a policy framework to put measures in place for the management and protection of landscape; • To develop a National Landscape Character Assessment through data-gathering and an evidence-based description of character assessment; • To develop landscape policies; • To increase awareness of the landscape and public consultation; and • To identify education and training needs.
Cultural Heritage	Heritage 2030 (DHLGH, 2020)	Heritage Ireland 2030 is Ireland's new national heritage plan. It is to be a coherent, comprehensive and inspiring framework of values, principles, strategic priorities and actions to guide and inform the heritage sector over the next decade.
	Culture 2025	Culture 2025 is a Framework Policy to 2025 which sets the vision for the future of culture and the arts in Ireland and prioritises actions. It recognises the diverse and multi-faceted nature of culture in Ireland and the contribution of 'culture' to sense of self, national identity and the arts.

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) ENVIRONMENTAL REPORT (ER)

Topic	Title	Summary of Objectives: National
	Government Policy on Architecture 2009-2015	This paper addresses issues that have arisen in the years since the publication of the first policy on architecture by setting out a number of goals: emphasising sustainable development of the environment and urban design; the encouragement and support of high quality modern architecture; the incorporation of architectural heritage in a more holistic and integrated manner; and developing actions which respond to and promote awareness in these areas. This Policy in tandem with the government's policy "Building Ireland's Smart Economy: A Framework for Sustainable Economic Renewal" sets out a number of priorities and actions that the Government will be taking in the short and medium term. Key elements include investment in research and development, a focus on co-ordinated "forward planning" and investment in renewable energy together with the promotion of the green enterprise sector and the creation of jobs.
	Historic Towns Initiative	The Historic Towns Initiative and the Living City Initiative (2015) apply to the six large urban areas as developed by the Department of Finance. As well as the European Regional Development Fund-supported Designated Urban Centres Grants Scheme 2014 – 2020, the aims of these are to encourage urban regeneration and facilitate consolidation of towns and cities.
	Living City Initiative (2015)	
	Designated Urban Centres Grants Scheme 2014 – 2020	
	Framework and Principles for the Protection of Archaeological Heritage (1999)	The document sets out the basic principles of national policy regarding the protection of archaeological heritage. The document focuses particularly on the principles which should apply in respect of development and archaeological heritage.
	The National Monuments Acts (1930 to 2004)	Objectives seek to protect monuments of national importance by virtue of the historical, architectural, traditional, artistic or archaeological interest attaching to them and includes the site of the monument, the means of access to it and any land required to preserve the monument from injury or to preserve its amenities.
	The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999	Provides for the establishment of a National Inventory of Architectural Heritage (NIAH). The objective of the NIAH is to aid in the protection and conservation of the built heritage, especially by advising planning authorities on the inclusion of particular structures in the Record of Protected Structures (RPS).
	Guidelines for Planning Authorities: Architectural Heritage Protection, 2004	The Planning and Development Act 2000, required additional development objectives relating to the protection of structures which are deemed to be of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest and to preserve the character of architectural conservation areas.
	The Planning and Development Act 2000, as amended	Under this Act the County Councils are required to compile and maintain a Record of Protected Structures (RPS) in their Development Plans. Sites included in the RPS are awarded automatic protection and may not be demolished or materially altered without grant of permission under the Planning Acts.
	Grid 25 Implementation Programme 2017-2022 and Ireland's Grid Development Strategy, 'Your Grid Your Tomorrow' (EirGrid)	The Grid Implementation Plan is a high-level Plan which outlines how EirGrid envisages undertaking the development of the electricity transmission grid in the short, medium (over the five-year cycle of the Plan), and in the longer-term to support a sustainable and reliable electricity supply. The Grid Implementation Plan brings together the high-level strategies outlined in EirGrid's Ireland's Grid Development Strategy; Your Grid, Your Tomorrow (2017) and the approved Transmission Development Plan 2016-2026, and details how electricity transmission infrastructure will be developed over the next five years.
	Shaping our Electricity Future (EirGrid, 2021)	Report details innovative approaches to developing the grid in order to meet ambitious 2030 renewable energy targets. Specifically, it must redevelop the grid to manage 70% of Ireland's electricity coming from renewable sources by 2030.

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) ENVIRONMENTAL REPORT (ER)

Topic	Title	Summary of Objectives: National
	Delivering a Secure, Sustainable Electricity System (DS3) Programme	The aim of the DS3 programme is to meet Ireland's 2020 electricity targets by increasing the amount of renewable energy on the Irish power system in a safe and secure manner.
	Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure, (DCENR, 2012)	A Government policy document which reaffirms, the imperative need for development and renewal of our energy networks, in order to meet both economic and social policy goals.
	Tomorrow's Energy Scenarios 2019 - System Needs Assessment - Planning Our Energy Future (EirGrid, July 2019)	Tomorrow's Energy Scenarios 2019 is the updated version and the document outlines scenarios for the future development of Ireland's electricity future, over a 20 year timeframe. It maps out three scenarios intended to outline a range of credible pathways to the renewable energy transition, and what these would mean for the transmission system in Ireland. The three forecast scenarios replace the four used in Tomorrow's Energy Scenarios 2017.
	All-Island Ten Year Transmission Forecast Statement 2019 (EirGrid & SONI, 2018)	The publication notes that in order to meet targets set by the government's Climate Action Plan 2019, investment will be needed in new renewable generation capacity and electricity networks. The transition to low-carbon and renewable energy will have widespread consequences, requiring a significant transformation of the electricity system.
	Draft Grid Implementation Plan 2017-2022 (EirGrid, 2018)	This second Grid IP (2017-2022) is primarily directed towards the manner in which projects are developed and implemented by EirGrid and builds upon the strategic actions developed in the earlier Grid 25 IP (2011–2016).
	All-Island Generation Capacity Statement 2019-2028 (EirGrid)	This annual statement outlines the expected electricity demand and the level of generation capacity that will be required on the island over the next ten years.
	National Policy Statement on Electricity Interconnection (DCCAE, 2018)	Consideration of interconnectors will be important in terms of increasing import and export capacity, and increased connectivity with the UK (Greenlink) and the continent (Celtic Interconnector).
	Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (Department of Business, Enterprise and Innovation, 2018)	As large consumers of electricity, data centres pose particular challenges to the future planning and operation of a sustainable power system. This statement notes the potential that renewable splay in facilitating the development of data centres outside Dublin.
	A Study of the Economic Benefits of Data Centre Investment in Ireland (Grant Thornton for IDA Ireland, May 2018)	Data centres and investment in them are recognised as having significant benefit to Ireland's economy and employment. Ireland has an abundance of renewable energy sources including wind energy, to meet energy demands of data centres which are increasingly looking to renewable energy sources for their operations.
	National Ports Policy (DTTAS, 2013)	The national Ports Policy outlines the organisational and ownership structure of ports in Ireland. This policy document covers: the Trans European Network – Transport (TEN-T), Ports of National Significance (Tier 1 and Tier 2) and Ports of Regional Significance; corporate governance; how ports policy relates to the planning and development system; and environmental and foreshore issues. The policy document also sets out key actions and timelines up to 2018.
	A National Aviation Policy for Ireland (DTTAS, 2015)	This policy document sets out the international context for aviation policy in Ireland. The document covers: safety, security and sustainability; connectivity and aviation services; airports; regulation and governance; aircraft leasing, financing and MRO; general aviation, education and training.

Review of Regional and County Level Plans, Programmes and Policies

Topic	Title	Summary of Objectives: Regional
Biodiversity	Hen Harrier Threat Response Plan (see also Hen Harrier Conservation and the Forestry Sector in Ireland (2015))	Under regulation 39 of the European Communities (Birds and Natural Habitats) Regulations 2011 provision is made to develop and implement appropriate threat response plans. The purpose of such a plan would be to cease, avoid, reduce or prevent threats, pressures or hazards that may be having an adverse effect on the conservation status of a species of bird referred to in Article 1 of the Birds Directive and/or causing the deterioration of the habitats of species for which a European Site has been classified pursuant to the Birds Directive.
Planning	Regional Spatial and Economic Strategies 2016-2022 (RSES)	Regional Spatial and Economic Strategies (RSES) are intended to replace the current Regional Planning Guidelines. The RSESs are expected to cover the period 2016-2022. Three Regional Assemblies to produce a RSES. In addition to formulating RSESs, the main functions of the Regional Assemblies will also include strategic functions under relevant legislation, functions that relate to EU funding programmes as well as oversight of local authority performance and the implementation of national policy.
	County Development Plans (including Landscape Character Assessments where available)	This Development Plan is the county's principle strategic planning policy document. Detailed land-use zoning maps for the main settlements of the county are contained in the Electoral Area Local Area Plans and the Special Local Area Plans. It is a six year development plan for the County that attempts to set out, as concisely as possible the County Council's current thinking on planning policy. The plan also sets out the overall planning and sustainable development strategy for the county which must be consistent with the National Planning Framework and the RSES.
	County Tourism Strategies	The purpose of these Strategies is to provide an agreed framework to guide the actions of the many interests involved in the tourism sector. They normally include priorities and recommended actions to achieve the tourism vision for a County.
Transport	Greater Dublin Area Transport Strategy 2016-2035	Objective of this long-term strategy is to inform transport planning in the Greater Dublin Area and how it should evolve. The strategy emphasises sustainable land use planning, public transport modes and the integration of land use planning with transport planning.
	Draft Transport Strategy for the Greater Dublin Area 2016 – 2035 (NTA)	This strategy provides a framework for the planning and delivery of transport infrastructure and services in the Greater Dublin Area (GDA) over the next two decades. It also provides a transport planning policy around which other agencies involved in land use planning, environmental protection, and delivery of other infrastructure such as housing, water and power, can align their investment priorities.
	A Platform for Change: An integrated transportation strategy for the Greater Dublin Area 2000 to 2016 (DTO, 2001)	The Greater Dublin Area comprises the local authority areas of Dublin Corporation and the counties of Fingal, South Dublin and Dún Laoghaire-Rathdown (the Dublin Region), and the counties of Kildare, Meath and Wicklow (the Mid-East Region). The Dublin Transport Office published its 'Platform for Change' document in 2000, in which it outlined the transportation strategy for the Greater Dublin Area (GDA) from 2000 to 2016. The document produced a practicable set of recommendations for new transport infrastructure and complimentary measures to manage projected growth in the demand for travel from all sections of the community over twenty years.
Cultural Heritage	Heritage Plans	The Heritage Plans identify objectives and actions to achieve those objectives as well as providing a mechanism to measure progress.

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Topic	Title	Summary of Objectives: Regional
Water and Wastewater	Catchment Flood Risk and Management Studies (CFRAMS)	The Office of Public Works (OPW) is responsible for the implementation of the Floods Directive 2007/60/EC which was carried out through a Catchment-based Flood Risk Assessment and Management (CFRAM) Programme. As part of the directive Ireland was required to undertake a Preliminary Flood Risk Assessment (PFRA), to identify areas of existing or potentially significant future flood risk and to prepare flood hazard and risk maps for these areas. Following this, Flood Risk Management Plans (FRMPs) were developed for these areas setting objectives for managing the flood risk and setting out a prioritised set of measures to achieve the objectives. The OPW has produced an individual Flood Risk Management Plan ((FRMP) for each of the 29 River Basins.
	River Basin Management Plan (RBMP)	A key development in meeting the requirements of the Water Framework Directive has been the publication of River Basin Management Plans. The plans implement the objectives of the Water Framework Directive. The aim is to achieve good water quality status in all waterbodies by 2015, through the implementation of a programme of Measures (POM). The Minister for the Environment, Community and Local Government has put in place new governance structures and administrative arrangements for the implementation of a second cycle of River Basin Management Plans and this will change the context for future reporting on water quality in Ireland. The existing seven River Basin Districts are to be reconfigured into three RBDs. The second cycle of RBM plans cover the period 2017-2021.
	Water Services Strategic Plan	The Water Services Act 2014 provides that the water services authority makes a Water Services Strategic Plan (WSSP) with regard to the provision of water services. As such, Irish Water, as the national water service utility for Ireland, has developed a Water Services Strategic Plan for the next 25 years. The priorities for Irish Water under the WSSP are the delivery of improved and affordable water services, remediation of existing water quality problems (e.g. boil notices), complying with the Urban Wastewater Treatment Directive, reduction of leaks in the water system and the capture of water infrastructure information in databases. The WSSP's objectives also have regard to flood risk management.
	Groundwater Protection Schemes	Groundwater protection schemes are undertaken jointly between the Geological Survey of Ireland and the local authorities. The objectives of such schemes are to preserve groundwater quality, in particular having regard to extraction for drinking water purposes. The schemes do not have any statutory authority but do set out a framework to help inform decision-making and provide guidelines for the local authorities in carrying out their functions. The Plan should have regard to any such groundwater protection schemes.
	Shellfish Pollution Reduction Programmes	The aim of the Shellfish Waters Directive is to protect or improve shellfish waters (see Shellfish Waters Directive, 2006/113/EC). The Directive requires Member States to designate waters that need protection in order to support shellfish life and growth. The Directive also provides for the establishment of pollution reduction programmes for the designated waters, of which there are 63 nationally.
	Freshwater Pearl Mussel Sub-basin Management Plans (Draft)	The draft Sub-basin Management Plans identify issues relevant to mussel conservation and propose realistic solutions.
	Forestry and Freshwater Pearl Mussel Plan (DAFM, in preparation)	As the consenting authority for key forestry activities, the Department of Agriculture, Food & the Marine (DAFM), through the Forest Service (FS-DAFM), has direct responsibilities under the Habitats Directive in relation to the protection of Freshwater Pearl Mussel (FPM) and its habitat. These responsibilities provide the underlying basis for the These responsibilities provide the underlying basis for the development of procedures to ensure that forestry activity undertaken with in all 27 FWPM catchments (including the Priority 8 catchments) are compatible with the conservation of the species.

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) ENVIRONMENTAL REPORT (ER)

Topic	Title	Summary of Objectives: Regional
Waste	Water Quality Management Plans	Water Quality Management Plans are a requirement under The Water Pollution Acts, 1977 and 1990 and regulations made thereunder. The aim of the plans is to manage and protect water at catchment-based level.
	Shannon Integrated Framework Plan (SIFP) (Clare County Council, 2017)	The Strategic Integrated Framework Plan (SIFP) for the Shannon Estuary is an inter-jurisdictional land and marine based framework plan to guide the future development and management of the Shannon Estuary.
	Regional Waste Management Plans 2015-2021	Ireland is divided into 3 regions for the purposes of waste management – Eastern-Midlands, Southern and Connacht-Ulster Regions. The plans set out the framework for the management of waste in a sustainable way, with overall targets to reduce the quantity of household waste generated per capita per year on year, to eliminate the disposal of residual waste to landfill and to aim for a reuse and recycle target of 50% of municipal waste by 2020.
	Waste Management – Changing our Ways (1998)	This was the first in a series of comprehensive government policy documents on the management of waste in Ireland. It endorsed the integrated waste management approach, based on the internationally adopted hierarchy of options which places greatest emphasis on waste prevention, followed by minimisation, re-use, recycling, energy recovery and finally, the environmentally sustainable disposal of residual waste.
	Preventing and Recycling Waste – Delivering Change (2002)	This government policy document built on Changing Our Ways moving to concrete proposals to give authorities more power to tackle the problem of waste. The document also announced the establishment of a National Waste Prevention Programme in the Environmental Protection Agency.
	Waste Management – Taking Stock and Moving Forward (2004)	This document (published April 2004) reviews progress and the continuing challenges in dealing with waste. It envisages the near-term introduction of thermal waste treatment as an alternative to landfill.
Sustainable Development/ Energy	A Resource Opportunity: Waste Management Policy in Ireland (DECLG, 2012)	National policy on waste management is set out in A Resource Opportunity, published in July 2012, and which sets out the measures through which Ireland will make the further progress necessary to become a recycling society, with a clear focus on resource efficiency and the virtual elimination of landfilling of municipal waste.
	Sustainable Rural Housing – Guidelines for Planning Authorities, Circular PL 2/2017 (April, 2005)	The guidelines set out in detail how the Government's policies on rural housing are to be implemented by planning authorities in making their development plans and in the operation of the development control system.
	Clare County Wind Energy Strategies	Prepared to respond to commercial demands for wind energy developments. The Strategy facilitates the development of onshore wind farms by maximizing the wind resource of the County while minimizing any environmental and visual impacts. The WES identifies sites of strategic regional and national importance that have the potential to accommodate wind energy development.

Appendix B

Clare CDP 2023-2029 Strategic Environmental Objectives

Parameter	Strategic Environmental Objective	SEO Code
Climate Change	<p>CC – Mitigation Measures</p> <p>CC1 - Reduce the need to travel/increased use of public transportation and achieve modal shift in transport across the county.</p> <p>CC2 – Decrease the usage of fossil fuels and increase both renewable resource usage and protection together with a move towards more low carbon energy sources.</p> <p>CC3 – Integrate Climate Change mitigation measures into every fabric of spatial planning through the restriction of inappropriate development/land-use zoning in flood risk zones, inclusion of green infrastructure as the status quo and the incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all developments</p> <p>CC4- Maintain and protect our natural carbon sinks (bogs/marshes/forests/fens) as decarbonising areas which can serve a dual purpose in terms of enhancement of biodiversity and mitigation against Climate Change.</p> <p>CC- Adaptation Measures</p> <p>CC5- Encourage and support the utilisation of energy-efficient and water-efficient building design to better equip homes and businesses to cope during times of shortage and service interruption, such as grey-water recycling, the use of solar PVs, passive houses etc.</p> <p>CC6 – Encourage the retrofitting of buildings with a particular focus on the existing council housing stock ensuring a Just Transition for all.</p> <p>CC7 – In preparing the spatial plan for our county that we develop ecologically resilient and varied landscapes through the establishment and preservation of ecological networks and stepping-stones as part of our settlement zonings and objectives and foster adaptive management practices in the face of uncertainty, favouring flexible adaptation options and allowing for alterations of the Plan as monitoring and evaluation data become available during its implementation.</p>	CC
Population & Human Health (inc. Quality of Life)	<p>P1 – Protect, enhance and improve people’s quality of life based on high quality residential, community, educational, working and recreational environments and on sustainable travel patterns.</p> <p>P2 - To protect human health</p>	PHH
Biodiversity, Flora and Fauna	<p>B1 – Protect, conserve, enhance where possible and avoid loss of diversity and integrity of the broad range of habitats, species, wildlife corridors, ecosystems and geological features.</p> <p>B2 – To achieve the conservation objectives of European Sites (SACs and SPAs) and other sites of nature conservation.</p> <p>B3 - Conserve and protect other sites of nature conservation including NHAs, pNHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries as well as protected species outside these areas as covered by the Wildlife Act.</p>	BFF

Parameter	Strategic Environmental Objective	SEO Code
	B4 - Meet the requirements of the Water Framework Directive and the River Basin Management Plan.	
	B5 – To minimise and, where possible, eliminate threats to biodiversity including invasive species.	
	B6 - Promote green infrastructure networks, including riparian zones and wildlife corridors.	
Soil & Geology	S1 – To maximise the sustainable re-use of the existing built environment, derelict, disused and infill sites (brownfield sites), rather than greenfield sites. <i>(This is in line with the Active Land Management Strategy RPO34 – Regeneration, Brownfield, Infill Development)</i>	SG
	S2 – Minimise the excavation and movement of soils within site works	
	S3 – Minimise the consumption of non-renewable deposits on site.	
Water	W1 – Implement appropriate Sustainable urban Drainage Systems (SuDS) in the County with a focus on Nature Based Solutions. (Attenuate, innovate, reuse, reimagine & utilise water in a different way)	Type equation here.W
	W2 – Reduce the impact of polluting substances to all waters and prevent pollution and contamination of ground water by adhering to aquifer protection plans and to maintain and improve the quality of drinking water supplies.	
	W3 - Promote sustainable water use and water conservation in the plan area and to maintain and improve the quality of drinking water supplies.	
	W4 –Protect flood plains and areas of flood risk from development through avoidance, mitigation and adaptation measures.	
	W5 – To promote a responsible attitude to recreation and amenity use of water in relation to water quality and disturbance to species and to prevent pollution and contamination of designated bathing waters.	
Air and Noise	C1 – Minimise all forms of air pollution and maintain/improve ambient air quality.	AN
	C2 - Minimise emissions of greenhouse gases and contribute to a reduction and avoidance of human-induced global climate change.	
Material Assets		
Transport	T1 – Maximise sustainable modes of transport and encourage use of walkways/cycle paths as alternative routes to school, work, and shops.	MA
	T2 - Provide for ease of movement for all road users and to promote development patterns that protect and enhance road safety.	
Waste	WA1 – Implement the waste pyramid and encourage reuse/recycling of material wherever possible.	
	WS1 - To ensure adequate and clean drinking water supplies.	

Parameter	Strategic Environmental Objective	SEO Code
Water Supply	WS2 - Improve efficiency in distribution of potable water to the population through pipe rehabilitation and to promote water conservation and sustainable water usage for long-term protection of available water resources.	
Waste Water	WW1 - To ensure that all zoned lands (existing and proposed) are connected to the public sewer network ensuring treatment of wastewater which meets EU requirements prior to discharge.	
	WW2 - Reduce the dependency on individual proprietary wastewater treatment facilities and ensure the highest standards possible in existing and future wastewater treatment facilities.	
Renewable Energy	RE1 - Reduce waste of energy, promote use of renewable energy sources and support energy conservation initiatives across all sectors including the development of low carbon business practices and buildings.	
Cultural Heritage	CH1 – Protect and conserve the cultural heritage including the built environment and settings; archaeological (recorded and unrecorded monuments), architectural (Protected Structures, Architectural Conservation Areas, vernacular buildings, materials and urban fabric) and manmade landscape features (e.g. field walls, footpaths, gate piers etc.) of the county.	CH
	CH2 – To protect, conserve and enhance local folklore, traditions and placenames within the Plan area.	
	CH3 – To ensure the restoration and re-use of existing uninhabited and derelict structures where possible opposed to demolition and new build (to promote sustainability and reduce landfill).	
Landscape	L1 – Conserve, protect and enhance valued natural, cultural and built landscapes, views of local value and features including those of geological and aesthetic value.	L
	L2 - Maintain and enhance landscape quality within the plan area by minimising visual impacts through appropriate design, assessment and siting.	

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1 INTRODUCTION

Clare County Council (CCC) has prepared a new Clare County Development Plan 2023-2029 (hereafter referred to as the 'Clare CDP 2023-2029'). In tandem to the preparation of the new CDP, a new Clare Renewable Energy Strategy 2030 has been prepared (hereafter referred to as 'the Clare RES' or 'the RES') which is included as Volume 5 to the Clare CDP. It outlines the renewable energy resource that is deliverable in County Clare. The Clare RES looks beyond the lifetime of the CDP, with a horizon year of 2030.

This Strategic Environmental Assessment (SEA) Statement has been prepared in accordance with Article 8 (Decision Making) of EU Directive 2001/42/EC on Strategic Environmental Assessment; and the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435/2004), as amended by S.I. 200/2011.

This document provides information on the decision-making process and documents how environmental considerations, the views of consultees and the recommendations of the Environmental Report and the assessment carried out under Article 6 of the Habitats Directive have been taken into account by, and influenced, the final Clare RES.

The content of the SEA Statement is as follows:

1. Introduction
2. Summary of Key Facts
3. Summary of the SEA Process
4. Influence of the SEA Process on the Clare RES
5. How consultation feedback has influenced the Clare RES
6. Preferred Scenario and Reasons for Choosing
7. Measures to Monitor Significant Environmental Effects of the Implementation of the Adopted RES
8. Conclusions and Next Steps
9. Addendum to the Environmental Report

In addition to the SEA of the Clare RES, Appropriate Assessment (AA) has also been undertaken on the RES. Where relevant, this process is referred to in the SEA Statement to facilitate a rounded understanding of how environmental issues have been integrated in the final RES. Separate documentation recording these assessments is available on the CCC website <https://clarecdp2023-2029.clarecoco.ie/>.

2 SUMMARY OF KEY FACTS

Title of Strategy:	Clare County Renewable Energy Strategy 2030 (Clare RES)
Purpose of Strategy:	The Strategy outlines the renewable energy resource that is deliverable in County Clare. Its vision is consistent with an objective of the CDP, and the Vision of the RES is: <i>A County Clare that is national leader in renewable energy generation which supports energy efficiency and conservation, and which achieves balanced social and economic development throughout the County and assists in achieving Ireland's Green Energy target.</i>
Competent Authority:	Clare County Council
Period Covered:	2023 – 2030
Area Covered:	The strategy covers the whole of County Clare.
Nature and Content of the Strategy:	<p>The strategic aims of this Strategy are:</p> <ul style="list-style-type: none"> <i>a. To support the attainment of and to exceed in County Clare, where possible, the National targets and commitments to renewable energy.</i> <i>b. To identify/highlight the opportunities for various renewable energy technologies and resources and identify broad areas suitable for their development in full compliance with the requirements of all environmental legislation including the requirements of the Strategic Environmental Assessment Directive, Habitats Directive, Birds Directive and Water Framework Directive.</i> <i>c. To provide an evidence-based strategy founded on understanding the local feasibility and potential for renewable and low carbon technology, predicated upon optimising the County's natural and socio economic, advantages and key assets, core skills, and nearby research institutes.</i> <i>d. To maximise the opportunities for renewable energy development whilst safeguarding the environment and existing residential amenities.</i> <i>e. To safeguard, where appropriate, areas with potential for renewable energy projects and to guide renewable energy development to preferred locations.</i> <i>f. To set out policies and objectives for the main renewable sectors subject to Strategic Environmental Assessment (SEA) and Appropriate Assessment requirements.</i> <i>g. To provide guidance on energy efficiency and conservation.</i> <i>h. To promote research and development, and to foster a supportive environment for innovation and demonstration of new and emerging renewable energy systems and technologies in County Clare; to encourage collaboration between private companies, public sector, education sector and communities.</i> <i>i. To provide a clear development management framework.</i>
Date Strategy Came into Effect:	The final Clare CDP 2023-2029 (which includes the Clare RES 2030) was adopted on 9 March 2023 and will come into effect from 20 April 2023.
Main Contact:	Clare County Council, Áras Contae an Chláir, New Road, Ennis, Co. Clare, V95 DXP2

3 SUMMARY OF THE SEA PROCESS

The Clare RES has been subject to a process of Strategic Environmental Assessment (SEA), as required under the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435/2004), as amended by S.I. 200/2011. This has included the key steps described in the following sections.

3.1 Key Stages in the Clare RES 2030 Process

In order to provide a detailed summary of the influence of the SEA process on the Clare RES, an overview of the key stages for the CDP as a whole (which includes the RES) is illustrated in **Figure 3.1**.

Clare County Development Plan 2023-2029	Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA)	Strategic Flood Risk Assessment (SFRA)
Commence preparation of Draft Plan Pre-Draft Consultation Period 18th September 2020 – 16th November 2020	Commence review and preparation of SEA Scoping Process Pre-Draft Consultation Period 18th September 2020 – 16th November 2020	Commence review and preparation of flood maps Pre-Draft Consultation Period 18th September 2020 – 16th November 2020
Commencement of public display and invitation of submissions on Draft Plan, Environmental Report, Natura Impact Report and Stage 2 Flood Risk Assessment December 2021 Closing date for public submissions on Draft Plan March 2022		
Chief Executives Report on Submissions received to Draft Plan, Environmental Report, Natura Impact Report and Stage 2 Flood Risk Assessment (for Elected Members) March – July 2022		
Consideration of Chief Executive's Report by Elected Members (resolve to alter or make, amend or revoke Draft Plan, Environmental Report, Natura Impact Report and Strategic Flood Risk Assessment) July – October 2022		
	Determination of Requirement for SEA/AA in accordance with S.12 of the Planning & Development Act (within 2 weeks of resolution) ¹	
Public Display of Amendments to Draft Plan and consultation period November 2022 – January 2023	Public Display of Amendments to Environmental Reports and consultation period November 2022 – January 2023	Public Display of Amendments to Strategic Flood Risk Assessment and consultation period November 2022 – January 2023
Submission of Chief Executive's Report to Members on submissions on the proposed material alterations to the Draft Plan, Environmental Report Addendum, Natura Impact Report and Strategic Flood Risk Assessment January 2023		
Consideration of Chief Executives Report by Elected Members (resolve to make, amend or revoke Draft Plan, Environmental Report, Natura Impact Report and strategic Flood risk Assessment) January – March 2023		
Clare County Development Plan 2023-2029 comes into effect 4 weeks after adoption, accompanied by the Environmental Report and SEA Statement and the Natura Impact Report April 2023		

Figure 3.1: The integrated processes of preparation and consultation for the Clare CDP 2023-2029 and Environmental Processes

3.2 Screening

The SEA Directive requires that certain plans and programmes, prepared by statutory bodies, which are likely to have a significant impact on the environment, be subject to the SEA process. An SEA screening of the CDP (including the RES) was undertaken by Clare County Council in 2020 after which it was concluded that SEA would be required.

3.3 Scoping and Statutory Process

Under Article 6 of the SEA Directive, the competent authority preparing the plan or programme is required to consult with specific ‘environmental authorities’ (statutory consultees) on the scope and level of detail of the information to be included in the ER. A Draft SEA Scoping Report was circulated to the statutory consultees as listed in **Table 3-1** in April 2021 for four weeks (with 4 May 2021 as the deadline for submissions on scoping).

Table 3-1: Environmental Authorities for SEA¹

SEA Environmental Authority
Environmental Protection Agency
Department of Housing, Local Government and Heritage
Minister for the Department of Communications, Climate Action and Environment
Minister for the Department of Agriculture, Food and the Marine (DAFM)

In addition to the above the following adjoining Local Authorities were also notified:

- Limerick City and County Council;
- Galway City and County Council;
- Kerry County Council; and
- Tipperary County Council

A copy of the scoping report was also issued to the Southern Regional Assembly.

All submissions received from statutory and non-statutory consultation were considered in preparation of the Environmental Report. All of the environmental topics listed in the SEA Directive were considered and all were scoped in for the purposes of the assessment.

3.4 Environmental Assessment and Environmental Report

The preparation of an Environmental Report on the likely significant effects on the environment of implementation of the draft RES included consideration of:

- The contents and main objectives of the RES;
- The current state of the environment and evolution of the environment in the absence of the RES;
- Links between the RES and other relevant strategies, policies, plans, programmes and environmental protection objectives;
- Environmental characteristics of the area to be affected by the RES and key environmental problems;
- The likely significant effects on the environment of implementing the RES (both positive and negative);
- Measures envisaged for the prevention, reduction and as fully as possible offset any significant adverse effects;
- An outline of the reasons for selecting the alternatives chosen; and

¹ Note – the table reflects the naming of department at the time of consultation.

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- Measures envisaged concerning monitoring of the significant environmental effects of implementation of the RES.

3.4.1 Summary of Assessment

The approach used for the assessment in the SEA Environmental Report was an ‘objectives-led assessment’. In this case, each of the draft RES policies were tested against defined SEA Strategic Environmental Objectives (SEOs), which covered all SEA environmental topics under the relevant SEA legislation; refer to **Table 3-2**. The SEOs were based on the current understanding of the key environmental issues having regard to the environmental protection objectives outlined in the main Environmental Report

A set of questions for each SEA topic was also outlined in the Environmental Report to help guide the assessment. A matrix format was used for the assessment, which also permitted a systematic approach and comparison of alternatives (refer to **Chapter 6** of this SEA Statement).

Table 3-2: Strategic Environmental Objectives

SEA Topic	Strategic Environmental Objective	To what degree will the draft RES ensure...
Population and Human Health (PHH)	PHH1: Ensure that renewable energy (RE) developments are planned, constructed and operated in a manner that avoids or minimises adverse impacts on local residents/ communities (including their quality of life) and maximises the community benefit of such developments.	<ul style="list-style-type: none"> No significant deterioration in human health as a result of environmental factors. Compliance with requirements for set-back distances from wind energy developments (Revised Wind Energy Development Guidelines (to be published)). Provision of security of energy supply to residents in County Clare. Provision of community gain through RE developments Encourage improved energy efficiency.
	PHH2: To protect human health from hazards or nuisances arising from incompatible RE-related land uses/developments.	<ul style="list-style-type: none"> No significant deterioration in human health as a result of changes to environmental factors. Protection of drinking water from indirect impacts associated with developing RE projects Reduce population exposure to high levels of noise from RE development. Compliance with requirements for set-back distances from wind energy developments (Revised Wind Energy Development Guidelines (to be published)).
Biodiversity, Flora and Fauna (BFF)	B1: Protect, conserve, enhance where possible and avoid loss of diversity and integrity of the broad range of habitats, species and wildlife corridors in line with the Birds and Habitats Directives in line with the Birds and Habitats Directive.	<ul style="list-style-type: none"> Provide effective protection of designated sites for habitats and species.
	B2: Conserve and protect other sites of nature conservation including NHAs, pNHAs, National Parks, Nature Reserves, Wildfowl Sanctuaries as well as protected species outside these areas as covered by the Wildlife Act.	<ul style="list-style-type: none"> Provision of effective protection and conservation to NHAs, pNHAs, Nature Reserves, Wildlife Sanctuaries and Habitats Directive Article 10 sites. Provision of effective protection and conservation to species protected under the Wildlife Act. Protection of habitats from unnecessary disruption from RE development.
	B3: To minimise and, where possible, eliminate threats to bio-diversity including invasive species.	<ul style="list-style-type: none"> Avoidance of spread or introduction of invasive species as a result of RE projects. Contribution towards the protection of habitats from invasive species.

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SEA Topic	Strategic Environmental Objective	To what degree will the draft RES ensure...
Water (W)	B4: Promote green infrastructure networks, including riparian zones and wildlife corridors as part of RE developments.	<ul style="list-style-type: none"> Promotion of green infrastructure within RE applications
	W1: Protect and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystem (quality, level, flow).	<ul style="list-style-type: none"> Protection of habitats and species by ensuring RE development does not alter their water needs in terms of water quality, flow rates, levels etc
	W2: Maintain or improve the quality of all surface waters and groundwater (including estuarine and marine water) in line with the requirements of the Water Framework Directive, the National Marine Planning Framework and the objectives of the National River Basin Management Plan with particular emphasis on restoring high status waters through the Blue Dot Catchment Programme.	<ul style="list-style-type: none"> Achieve or maintain at least Good Status, and no deterioration of existing status, for surface and groundwater bodies in line with the requirements of the WFD and the National River Basin Management Plan by 2027. Contribute to achieving and maintaining Good Environmental Status for marine waters in line with the requirements of the MSFD, and under the National Marine Planning Framework.
	W3: Implement appropriate sustainable drainage systems (SuDS) in the various renewable energy projects.	<ul style="list-style-type: none"> New drainage systems for any renewable energy projects to be compliant with SuDs.
	W4: Avoid the impact of polluting substances from any RE developments to all waters and prevent pollution and contamination of groundwater by adhering to aquifer protection plans and to maintain and improve the quality.	<ul style="list-style-type: none"> Achieve or maintain at least Good Status, and no deterioration of existing status, for surface and groundwater bodies in line with the requirements of the WFD and the National River Basin Management Plan by 2027.
	W5: Protect flood plains and areas of flood risk from RE development through avoidance, mitigation and adaptation measures.	<ul style="list-style-type: none"> In accordance with OPW and the Flood risk and Management Guidelines 2009, ensure RE developments do not contribute to flood risk.
Land and Soils (Geology) (LS)	S1: To maximise the sustainable re-use of the existing built environment, derelict, disused and infill sites (brownfield sites), rather than greenfield sites for RE development. (<i>This is in line with the Active Land Management Strategy RPO34 – Regeneration, Brownfield, Infill Development</i>)	<ul style="list-style-type: none"> Preference for development on brownfield site over green field. Limited and controlled development of greenfield sites. Avoid incidences of soil contamination.
	S2: Minimise the excavation and movement of soils within site works associated with RE developments.	<ul style="list-style-type: none"> Soils is reused on site where possible. Limit the amount of excavation in sensitive locations for example peat excavation in wind farm sites. Ensure sustainable extraction of non-renewable sand, gravel and rock deposits and the reuse and recycling of construction and demolition waste.
	S3: Minimise the consumption of non-renewable deposits on site.	<ul style="list-style-type: none"> Re-use of soils from redeveloped sites where possible
	S4: Minimise the amount of waste to landfill from RE development in line with the waste management hierarchy.	<ul style="list-style-type: none"> Reduction in the quantities of waste sent to landfill. Increase in the quantities of waste sent for recycling and recovery. Compliance with national and regional waste planning and Ireland's National Waste Policy 2020-2025.
	S5: Conserve, protect and avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites.	<ul style="list-style-type: none"> Avoid loss of diversity and integrity of designated habitats, geological features, species or their sustaining resources in designated ecological sites
	S6: No contribution to landslide or slope instability from renewable energy development.	<ul style="list-style-type: none"> Minimise potential for disruption to, and loss of, sensitive soil and land resources. Avoid topographically unsuitable areas.

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SEA Topic	Strategic Environmental Objective	To what degree will the draft RES ensure...
	S7: Protect against the displacement of agricultural food crops.	<ul style="list-style-type: none"> Protection of agricultural food crop area.
Climatic Factors (including air quality) (CF)	C1: Meet relevant air and noise standards and support initiatives to reduce air and noise pollution.	<ul style="list-style-type: none"> Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030 and Climate Action Plan (2019). Facilitate the introduction and construction of infrastructure to support the renewable energy sector. Achieve transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050 in line with the Climate Action Plan (2019)
	C2: Contribute towards a reduction of Greenhouse Gas Emissions in line with relevant targets.	<ul style="list-style-type: none"> Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030
	C3: Contribute to mitigation of, and adaption to climate change.	<ul style="list-style-type: none"> Contribute to reducing GHG emissions Maximise the use of renewable energy resources and reduce the dependency on fossil fuels Contribute to meeting the targets set out in the National Energy and Climate Plan 2021-2030 No increase in flood risk from RE development Protection of biodiversity from potential impacts from climate change
Climate Change – Mitigation Measures (CCM)	CC2: Decrease the usage of fossil fuels and increase both renewable resource usage and protection together with a move towards more low carbon energy sources.	<ul style="list-style-type: none"> Facilitate implementation of sustainable modes of transport (i.e. provision of charging points) Increase in renewable energy developments Reduction on use of fossil fuels Promote the use of renewable and sustainable resources (i.e. biomass, AD, offshore wind, hydro and geothermal energies) Improve efficiency of energy infrastructure
	CC3: Integrate Climate Change mitigation measures into every fabric of spatial planning through the restriction of inappropriate development/land-use zoning in flood risk zones, inclusion of green infrastructure as the status quo and the incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all developments.	<ul style="list-style-type: none"> Avoidance of inappropriate development of RE infrastructure in sensitive areas i.e. flood risk zones Incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all RE developments
	CC4: Maintain and protect our natural carbon sinks (bogs/marshes/forests/fens) as decarbonising areas which can serve a dual purpose in terms of enhancement of biodiversity and mitigation against Climate Change.	<ul style="list-style-type: none"> Protection of carbon sinks
Climate Change – Adaptation Measures (CCA)	CC5: Encourage and support the utilisation of energy-efficient and water-efficient building design to better equip homes and businesses to cope during times of shortage and service interruption, such as grey-water recycling, the use of solar PVs, passive houses etc.	<ul style="list-style-type: none"> Promote the use of renewable and sustainable resources in building design (i.e. solar, passive houses) Improve energy efficiency of infrastructure
	CC6: Encourage the retrofitting of buildings with a particular focus on the existing council housing stock ensuring a Just Transition for all.	<ul style="list-style-type: none"> Improve energy efficiency of existing infrastructure
Cultural Heritage (CH)	CH1: Protect and conserve the cultural heritage including the built environment and settings; archaeological (recorded and unrecorded monuments), architectural (Protected Structures, Architectural Conservation Areas, vernacular	<ul style="list-style-type: none"> No permitted renewable energy developments which involves loss of cultural heritage, including protected structures, archaeological

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SEA Topic	Strategic Environmental Objective	To what degree will the draft RES ensure...
	buildings, materials and urban fabric) and manmade landscape features (e.g. field walls, footpaths, gate piers etc.) of the county.	sites, Architectural Conservations Areas and landscape features
	CH2: To ensure the restoration and re-use of existing uninhabited and derelict structures where possible opposed to demolition and new build (to promote sustainability and reduce landfill).	<ul style="list-style-type: none"> Re-use of existing buildings as opposed to demolition or new buildings
Landscape (LandS)	L1: Ensure no significant disruption of historic/cultural landscapes and features, through objectives of the RES.	<ul style="list-style-type: none"> Ensure no significant disruption of historic/cultural landscapes, seascapes and features through objectives of the RES.
	L2: Ensure there is no significant visual impact from RE development on both landscapes and seascapes.	<ul style="list-style-type: none"> No significant visual impact from development.
Material Assets (MA) – Transport	T1: Maximise sustainable modes of transport and encourage use of renewable transport technologies.	<ul style="list-style-type: none"> Facilitation in the implementation of sustainable modes of transport (i.e. provision of charging points) Uptake of renewable transport technologies
Material Assets (MA) – Waste	WA1: Implement the waste pyramid and encourage reuse/recycling of material wherever possible.	<ul style="list-style-type: none"> Reduction in the quantities of waste sent to landfill from Renewable energy projects Increase in the quantities of waste sent for recycling from renewable energy projects. Compliance with the Southern Region Waste Management Plan and Irelands National Waste Policy 2020-2025.
Material Assets (MA) – Water	WS1: To ensure adequate and clean drinking water supplies.	<ul style="list-style-type: none"> Ensure RE infrastructure does not negatively impact on water supply
Material Assets (MA) – Renewable Energy	RE1: Reduce waste of energy, promote use of renewable energy sources and support energy conservation initiatives across all sectors including the development of low carbon business practices and buildings.	<ul style="list-style-type: none"> Increase in renewable energy developments. Contribute to improved energy efficiency.

The Draft RES outlined objectives in relation to a number of different technologies, such as Bioenergy (Biomass) and Anaerobic Digestion, Micro Renewables, Geothermal & Ground Source Heat Pump, Solar, Onshore Wind, Marine Renewables (Wave and Tidal Energy), Micro Hydroelectric and Pumped Hydro Energy Storage. The different technologies all have the potential for environmental impacts, both positive (in terms of increasing renewable energy, contributing to county and national targets, improved air quality depending on development type etc.) as well as negative impacts.

The energy efficiency policies within the draft RES are broadly positive through energy efficiency measures within existing building stock. However, there is potential for impacts on certain receptors through new RES infrastructure (e.g. protected structures), or effects on protected species through retrofitting e.g. bats.

The assessment of policies and related policy actions which are set out in the plan are summarised in **Table 3-3**.

Table 3-3: Summary of draft RES Measures and Assessment

Sections	Summary of Measures and Assessment	Mitigation?
Chapter 1 – Introduction and Vision		

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Sections	Summary of Measures and Assessment	Mitigation?
RES 1.1 Proposed SEA and NIR Mitigation Measures (apply to all renewable energy development)	The general mitigation measure proposed as part of the SEA ER following the assessment of Chapter 3 of the draft Clare RES have been incorporated into the draft Clare RES as RES 1.1 A-D . The three mitigation measures proposed by the NIR have been incorporated into the draft Clare RES as RES 1.1 E-G .	Ü
Chapter 2 – Legislation and Policy Context		
Chapter 2- Legislation and Policy Context	<i>No objectives included.</i>	N/A
Chapter 3 – Energy Profile of County Clare		
RES 3.1 Meeting the County's energy needs from 100% renewables	Use of indigenous renewable energy sources would result in positive impacts to PHH, AQ, CCM, CCA and MA as such sources would result in cleaner emissions and require less importation and reliance on non-renewable sources. Negative impacts to AQ could also occur during the construction phase e.g. from increased noise and dust. All of these technologies were noted could have potential neutral to negative impacts on W/ LS/ CH/LandS as a result of construction or inappropriate siting of RE infrastructure to achieve the targets.	Ü
Chapter 4 – Summary of Renewable Potential, Resource and Targets		
RES 4.1 Meeting the County's energy needs from 100% renewables	This objective is positive in relation to PHH, CF, CCM and CCA and MA for renewable energy. However, negative impacts to AQ could also occur during the construction phase from increased noise and dust. Additionally, all of these technologies could have potential neutral to negative impacts on BFF/ W/ LS/ CH/LandS as a result of construction or inappropriate siting of RE infrastructure. Overarching mitigation measures applicable to all renewable energy developments were recommended and integrated into the draft RES as Objectives RES 1.1 A-G.	Ü
Chapter 5 – Energy Conservation and Efficiency		
RES 5.1 Energy Efficiency and Conservation	<p>Objectives RES 5.1 A-F relate to energy efficiency/ energy conservation in relation to incorporation of measures into new developments and improving the environmental performance of existing building stock. These are positive in relation to PHH, AQ, CF, CMM, CMA and MA as they may result in increased employment opportunities, reduced GHG emissions and promotion of energy efficiency across public sector and various new developments. Objectives RES 5.1 C-E will also have neutral impacts on BFF, W, S, CH, MA as the focus is on the internal building efficiency, however there are potential impacts on LandS from solar panel installations.</p> <p>Objectives RES 5.1 G(a-c) relate to promoting energy efficiency and design, and promoting use of alternative energy vehicles in the county. These will likely have positive impacts on PHH, AQ/CF/ CCM, CCA and MA but may have negative impacts to AQ/BFF, W, SL, CH and LandS from construction or operational activities.</p> <p>Objective RES 5.1 G(d) provides a means for better informing developers/ owners/ occupiers of the benefits of renewable energy technologies, and is extremely positive on PHH, CF, CMM, CMA and MA as it aims to provide awareness to developers/owners and occupiers of the benefits of renewable energy.</p> <p>Objectives RES 5.1 G(e-f) are similar in that they both support education and research in energy efficiency. These are extremely positive on PHH, CF, CMM, CMA, AQ and MA as it is focussed on the development of sustainable communities and the promotion of sustainable energy practices in industry and commerce which will consequently result in the reduction in energy usage.</p> <p>Objectives RES 5.1 G(g) and G(j) support education and research in energy efficiency. Therefore, these are overall positive across all SEOs.</p> <p>Objective RES 5.1 G (h) aims to identify significant 'waste' energy sources for energy conversion and local consumption. This is positive for PHH, CF, CCM and CCA as identifying the significant waste heat sources can help determine alternative energy resource(s). Negative impacts may arise to BFF, W, LS, CH, AQ and LandS as a result of the</p>	Ü

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Sections	Summary of Measures and Assessment	Mitigation?
	<p>construction related impacts. However, it will also result in cleaner air quality which is positive.</p> <p>Objective RES 5.1 G (i) supports use of energy efficient storage systems, and has similar impacts to RES 5.1 G(a)-(c) above, as with any infrastructure development, there may be indirect negative impacts during the construction and or operation phase depending on the location of the infrastructure.</p>	
Chapter 6 – Onshore Wind		
Onshore Wind	<i>No objectives included in the RES – existing Clare Wind Energy Strategy applies and remains unchanged.</i>	N/A
Chapter 7 – Solar Energy		
RES 7.1 Increase the penetration of commercial scale solar energy projects	RES 7.1 (A-C) relate to increased penetration of solar projects, redevelopment of brownfield sites for large solar PV, and development of solar on agricultural land as part of farm diversification/ multi-purpose use. These objectives are broadly positive for PHH, CF, CCM, CCA and MA as some underlying objectives are focussed on evaluating incorporation of solar within new developments or existing development, brownfield sites and agricultural lands. However negative may arise for AQ, BFF, W, LandS, CH and LS where loss of biodiversity, water pollution may occur due to commercial development. Any development of large solar PV will have to assess the sensitivity of the surrounding landscape and the land use.	Ü
RES 7.2 Promote integration of solar energy	RES 7.1 (A-C) relate to promoting the use of solar power across the county, into existing and planned developments, and to encourage its uses as art of applications for new developments/ refurbishments. These are considered to have positive impacts on PHH, CF, CCM, CCA and MA however negative may arise for AQ, BFF, W, LandS, CH and LS as a result of commercial development. Any development of large solar PV will have to assess the sensitivity of the surrounding landscape and the landuse. All development must comply with environmental legislation and be sympathetic in relation to impacts on the landscape and existing buildings of architectural merit.	Ü
Chapter 8 – Bio-energy		
RES 8.1 Increase the penetration of bio-energy projects	<p>Objectives RES 8.1 (A-B) are broadly positive for PHH, CMM, CCA, MA and CF as they aim to increase the usage/ uptake of bioenergy. However, there is potential for negative impacts e.g. displacement of agricultural lands, construction/operation-related impacts, seepage or introduction of non-native species and non-native crops.</p> <p>Objective RES 8.1 (C-D) have been added as a result of SEA mitigation and are broadly positive as these aim to support energy research initiatives and application of GIS tools and best practice in relation to land use changes. However, without any location-specific information for the initiatives, there remains potential for impacts on BFF, W, and LS in relation to land use.</p>	Ü
RES 8.2 Support Bio-energy development	Objectives RES 8.2 (A-B) are largely positive (AQ, CF, CCM, CCA, MA) as these promote the development of bio-energy opportunities. Whilst the objectives have potential to impact negatively on BFF, LS, W, PHH, CH and LandS the objectives aim to reduce any negative impacts through the mitigation already incorporated into the objective.	Ü
RES 8.3 Brownfield and industrial bio-energy development	Objective RES 8.3 aims to utilise brownfield sites or lands zoned for industrial/ enterprise use for bio-energy plants is considered to have generally positive effects on the environment. It is acknowledged there remains potential for impacts on the environment from the construction and operation of such facilities, however the reduction in GHGs will have positive impacts on CF/CCM/CCA.	Ü
RES 8.4 Bio-energy promotion	Objectives RES 8.4 A focuses on increasing the percentage of sustainable energy crops throughout the County; this will have potential negative impacts on BFF/W/LS/LandS/CH, through for instance land use changes, introduction on non-native species/crops, eutrophication etc. There are some potential positive impacts also for PHH and MA through increased employment opportunities.	Ü

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Sections	Summary of Measures and Assessment	Mitigation?
	<p>Objective RES 8.4 B aims to promote the installation of district heating schemes. Whilst district heating will reduce fossil fuel consumption and leverage the heat generated from industrial processes for other heating uses (namely in the residential sector), it also has the potential for negative impacts on BFF, W, SL, CH and LandS, mainly through ground disturbance and proximity to sensitive sites.</p> <p>Objective RES 8.4 C focuses on the implementation of best practice in green public procurement, which will have overall positive impacts on all of the SEOs.</p> <p>Objective RES 8.4 D is positive for PHH, CF, CCM, CCA and MA as it aims to promote wood biomass boiler actively through technology demonstrations, which will outline its benefits to the public and developers.</p>	
RES 8.5 Transportation and Access	The objective relates to facilitation of upgrading to entrances and off-road turning for forestry plantations. This will have mainly neutral impacts on the environment but there is potential for minor environmental impacts if for instance new entrances are developed due to loss of hedgerows or cause surface run-off issues etc.	Ü
RES 8.6 Monitoring Land Use Change	This objective has been added as a result of the SEA mitigation. Data gathering will have direct positive impacts across all SEOs in the longer term as it will build the evidence base to monitor land use change.	Ü
Chapter 9 – Marine Renewables		
RES 9.1 Support the National Marine Planning Framework	Objectives RES 9.1 (A-B) are overall positive as they relate to contributing towards meeting energy targets and will subsequently result in employment opportunities (in particular, with positive implications for PHH and MA) and reduction in GHG emissions (positive effects for CF).	Ü
RES 9.2 Facilitate the development of Marine Renewables	<p>Objectives RES 9.2 (A-C) relate to facilitating the development of RE infrastructure via testing, construction of infrastructure in the marine environment or associated land requirements, including for example substations, grid connections or port development. The associated impacts are deemed positive for AQ, CF, CCM, CCA and MA as a result of reduction in GHG emissions and use of cleaner technologies. By developing the offshore renewables there is associated positive impacts to land use, terrestrial BFF and LandS due to reduced pressure from onshore development or land-based renewable technologies.</p> <p>However, as with any form of development there are potential short term negative impacts associated with construction phases to, for instance, PHH and AQ from traffic, BFF/ LS due to loss of seabed or habitats and to W from sediment or pollution via incidents or spillages, CH from indirect impacts to unknown archaeology in the seabed. Long-term negative impacts may also occur to BFF, LandS and W during the operational stage due to turbines impacting on flight paths or marine mammals, visual impacts to seascape or ongoing pollution due to maintenance and impact on wave and tidal patterns etc</p>	Ü
RES 9.3 Strategic Marine Energy Infrastructural Development	<p>Objective RES 9.3 A will have positive impacts in relation to PHH, CF, CMM, CMA but many of the impacts are unknown or could have negative impacts on BFF, PHH, W, S/L, CH and LandS as it aims to develop new ports, expand existing port and associated infrastructure. The development of a new port and/or associated infrastructure has the potential to have significant impacts on the environment. While there are positive impacts to AQ, CF, CCM, CCA and MA many of the impacts are unknown or could have negative impacts on BFF, PHH, W, LS, W, CH and LandS. Negative impacts to AQ could also occur during the construction phase from increased noise and dust.</p> <p>Objective RES 9.3 (B-C) support the development of the onshore grid to facilitate offshore marine renewables. Whilst these are positive in relation to PHH, CF, CMM, CMA and MA, they will also have short-term negative impacts to BFF, LS, W, CH and LandS during the construction phase.</p>	Ü
RES 9.4 Marine Energy Service and Port Infrastructure	Objectives RES 9.4 (A-B) support expansion of the Ports within County Clare and will likely be positive for PHH, CF, CMM, CMA and MA but many of the impacts are unknown or could have negative impacts on BFF, PHH, W, S/L, CH and LandS as it aims to develop new ports, expand existing port and associated infrastructure.	Ü

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Sections	Summary of Measures and Assessment	Mitigation?
RES 9.5 Marine Energy Research and Development	<p>Objective RES 9.5 A is the same objective as Objective 9.2A and therefore the impacts are similar and discussed above under RES 9.2 A.</p> <p>Objective RES 9.5 B supports innovation enterprise hubs and the supply chain for offshore renewable energy. The construction activities will have short and long term negative impacts to AQ, BFF, PHH W, LS, LandS and CH depending on the location of the hubs.</p>	Ü
RES 9.6 Forward Planning for Offshore Energy	Objective RES 9.6 aims to carry out feasibility studies to enable offshore renewable energy to develop and will have direct overall positive effects on the SEOs in the medium and longer-term. However, there is potential for knock-on impacts for BFF, W, LS, LandS and CH.	Ü
Chapter 10 – Micro Generation		
RES 10.1 Support the framework for microgeneration	Objectives RES 10.1 (A-B) broadly relate to administrative arrangements for facilitating micro generation technologies to domestic and commercial properties. This is positive for PHH, AQ/CF/CCM, CCA and MA. However, the development of these technologies have the potential to impact to a certain extent on the natural environment, BFF, W, SL, CH, AQ and LandS and therefore the planning applications will require an environmental appraisal.	Ü
RES 10.2 Facilitate micro-renewable energy installations	<p>Objectives RES 10.2 (A-B) which relate to retro-fitting of existing buildings with micro technologies is positive to P/HH, AQ/CF/CCM, CCA and MA but may have negative impacts to AQ/BFF, W, SL, CH and LandS.</p> <p>Objective RES 10.2 C has been added as a result of the SEA mitigation and is broadly positive for PHH, MA, CF and CC. There is a potential of negative impact on surrounding built heritage and therefore planning applications will require an environmental appraisal.</p>	Ü
Chapter 11 – Micro Hydroelectric Power		
RES 11.1 Facilitating Micro Hydro Power	This objective aims to facilitate the development of MHP on a case by case basis. The RES does identify six commercial sites with potential to harness micro-hydroelectric power (MHP). Four of these sites will have environmental constraints in relation to BFF, W, LS and CH.	Ü
RES 11.2 Environmental safeguards specific to Micro Hydro Power	This objective incorporates a number of environmental considerations as a result of iterative feedback from the SEA process and is therefore positive across all SEOs.	Ü
Chapter 12 – Renewable Heat		
RES 12.1 Support the framework for Renewable Heat	<p>Objective RES 12.1 A relates to the overall ambition for Clare to help meet or exceed the national renewable heat (RES-H) target of 24% by 2030. It will likely have direct short, medium and long-term positive impacts across CF/CCM/CCA, PHH and MA. There are positive and negative aspects to AQ where biofuels are used. The dominant source for RES-H is from bioenergy, and the objectives do not outline the location of the supply of biomass, but it is presumed that a large amount could be grown within County Clare. This would have potential negative impacts on BFF, W and LS through introduction of non-native species crop, monoculture planting, land use change (e.g. loss of agricultural land to bioenergy crop) and eutrophication.</p> <p>Objective 12.1 (B-D) are broadly positive as these objectives relates to supporting schemes and incentives, particularly for CF/CCM/CCA, PHH and MA.</p>	Ü
RES 12.2 Promotion of renewable heat technology	<p>Objective RES 12.2 A, B and D are broadly positive across the SEOs as these objectives support consideration of RES-H in new developments.</p> <p>Objective RES 12.2 C relates to the development of CHP for DH in industrially-zones areas and will have positive impacts for PHH and MA, as local populations can receive reduced energy bills and a security of supply, along with positive effects for CF and AQ. As with any development, there is potential for negative impacts across SEOs during the construction phase of a development.</p>	Ü

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Sections	Summary of Measures and Assessment	Mitigation?
RES 12.3 Development and dissemination of geothermal potential	Objective RES 12.3 A is broadly positive for all SEOs particularly for LS and PHH as it is supportive of utilising environmental data and mapping, as well as best practice guidance, in relation to geothermal installations.	Ü
RES 12.4 Facilitation of ground collection and heat pump energy installations	Objective RES 12.4 A is directly positive in relation to BFF, PHH, W and LS it will protect wells, aquifers and water courses in the development of shallow geothermal energy sources. As the objective focuses on shallow geothermal, there is potential for neutral to negative impacts on BFF, W, LS and CH, as there will be disturbance of the ground and subsurface. Objective RES 12.4 B relates to the installation of ground collectors, heat pumps and geothermal energy installations, which are all directly positive in relation to PHH, CF/CCM/CCA and MA. There is also potential for neutral to negative impacts on BFF, W, LS and CH, as there will be disturbance of the ground and subsurface, and there are potential for localised effects from changes to ground temperature.	Ü
Chapter 13 – Renewable Transport		
RES 13.1 Renewable transport targets	Objective RES 13.1 relates to the overall ambition for Clare to help meet or exceed the national renewable transport (RES-T) target of 13.4% by 2030. It will have direct short, medium and long-term positive impacts across CF/CCM/CCA, PHH and MA. There are potential positive impacts on AQ also, as atmospheric pollutants such as NO _x , non-methane volatile organic compounds and particulate matter are the main tailpipe emissions from internal combustion engines, which should reduce with greater penetration of RES-T e.g. from use of electric vehicles.	Ü
RES 13.2 Accelerate electrification of private car fleet	Objectives RES 13.2 A-C relate to the accessibility of public charging infrastructure and encouraging consumer change, which is positive for PHH, CF, CCM, CCA, AQ and MA as such infrastructure can facilitate positive modal transport shifts.	Ü
RES 13.3 Accelerate transition of commercial fleets to low carbon fuels	Objectives RES 13.3 A and C are broadly positive across all SEOs as these relate to transitioning to low-carbon fuels. Objectives RES 13.3 B supports measures for alternative fuels in transport. While this is broadly positive, depending on the source of renewable fuel utilised, there may be air emissions associated. There could be indirect effects on BFF, PHH, W, AQ and CF as a result of emissions to air, depending on the source of the electricity generation (peat/coal vs. renewable electricity). There may also be trade-offs in AQ, for instance CNG-fuelled vehicles emit lower amounts of NO _x and particulates, however emissions of carbon monoxide are higher. The use of biofuels is also a consideration in terms of LS, as unintended land use change may occur should biofuels become more widespread, with potential for impacts on LS, as well as BFF/W should habitats become fragmented/converted to fuel crop.	Ü
Chapter 14 – Waste Resources to Energy		
RES 14.1 Make a proportional contribution to national targets	Objective RES 14.1 is broadly positive as it supports the use of waste as a resource and will have direct positive impacts across PHH, CF/CCM/CCA and MA. There can be impacts to AQ however from management of waste streams in terms of emissions to air and also exhaust emissions from the transportation of waste.	Ü
RES 14.2 Facilitating the development of Anaerobic Digestion facilities	Objectives RES 14.2 supports the development of anaerobic digestion (AD) facilities and will have positive impacts for PHH, MA and CF/CCM/CCA. However, there could be indirect operational nuisances such as noise and odour which could lead to temporary or persistent issues for PHH and AQ and may reduce quality of life for proximal communities.	Ü
RES 14.3 Small scale Anaerobic Digestion	Objective RES 14.3 relates to small-scale AD facilities, which are broadly very positive as long as proper planning and relevant environmental regulations are adhered to. However, as for any development, there is potential for negative impacts on BFF, W, CH, LS and LandS, and there could be localised impacts from noise and/or odour from a facility.	Ü
RES 14.4 AD and wastewater treatment	Objective RES 14.4 aims to evaluate the feasibility of AD facilities being installed at waste and wastewater treatment plants which is overall	Ü

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Sections	Summary of Measures and Assessment	Mitigation?
	positive across all SEOs; utilising existing built infrastructure could potentially reduce the area needed from greenfield.	
RES 14.5 Waste Energy Resource Utilisation	Objective RES 14.5 relates to the feasibility of identifying significant waste energy streams, which will have generally long term direct positive impacts for PHH, CF/CCM/CCA and MA.	Ü
RES 14.6 Energy From Municipal Solid Waste	Objective RES 14.6 is generally positive for PHH, CF/CCM/CCA and MA in relation supporting regional waste management planning. There are neutral impacts on the environment as this objective relates only to investigation of the feasibility of energy recovery in the county.	Ü
RES 14.7 Biogas potential	Objective RES 14.7 relates to examining opportunities for producing biogas from various streams, and supports collaboration efforts with Gas Networks Ireland to establish connection points. Supporting projects that look for opportunities for producing biogas from various streams will have positive impacts, particularly for MA and CF/CC. There may be some indirect negative effects on receptors such as AQ and PHH depending on the development e.g. from unwanted odours, if not managed appropriately. All such plants would however be subject to relevant EPA licensing requirements and associated limit values/ controls on emissions.	Ü
Chapter 16 – Energy Storage		
RES 15.1 Facilitating energy storage systems	This objective does not provide much detail on the forms of energy storage and therefore the potential impacts are unknown. Negative impacts maybe encountered for PHH and AQ for example due to traffic and other construction-related impacts. Similarly, AQ will also experience both positive due to use of cleaner technologies and short term negative impacts due to potential dust during construction. As with any commercial development, potential negative impacts may also occur from loss of biodiversity, water pollution etc.	Ü
RES 15.2 PHES Proposals	The development of pumped hydroelectric energy storage (PHES) is positive in relation to MA and PHH through the provision of renewable energy and security of supply. Any large scale development such as PHES could have impacts on the natural environment as outlined in, including impacts to water courses via pollution, impacts to fish migration patterns, changes to hydromorphology, changes to hydrogeology, or changes to hydrology (including changes to flood patterns). Environmental assessments should be undertaken for the protection of the natural environment from such large scale developments as PHES.	Ü
RES 15.3 Sustainability of energy storage proposals	This objective is positive as it aims to protect the receiving environment through examining ways to ensuring energy storage systems are safely managed and recycled at the end of life phase.	Ü
Chapter 16 – Supporting Infrastructure		
RES 16.1 Renewable Energy and Supporting Infrastructure	<p>Objective RES 16.1 A regarding direct consultation with EirGrid is positive for MA as existing infrastructure needs protection and CCC should be aware of the studies and projects that EirGrid are currently undertaking.</p> <p>Objective RES 16.1 B targets the promotion of smart grid and will have a neutral impact on the SEOs.</p> <p>Objective RES 16.1 C aims to provide a competitive supply chain economy could lead to better prices for residents within County Clare, which is positive for MA.</p> <p>Objective RES 16.1 D will have positive impacts on PHH, CF, CCM, CCA and MA and will help to meet the renewable energy targets for County Clare.</p> <p>Objective RES 16.1 E focuses on infrastructure expansion or upgrades which is positive for MA, but there is a potential for short-term negative impacts on PHH, BFF, LS, W, AQ, LandS and CH related to construction activities.</p> <p>Objective RES 16.1 F is positive in relation to population through the potential for employment in the research and development recommended by the objective. The facilitation of research is also positive for CF, CCM, CCA and MA.</p>	Ü

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Sections	Summary of Measures and Assessment	Mitigation?
	Objective RES 16.1 G relates to provision of district heating infrastructure could have positive impacts on residents and CF/CCM/CCA and MA through potential for reduced heating costs.	
Chapter 17 – Environmental Considerations & Development Management Advice		
17.2 Environmental Considerations	This section sets out a number of environmental considerations to be considered during the stages of development of RES and therefore is considered positive. A number of developments both in proximity and across the county can have effects on different receptors. Consideration of cumulative impacts will be important.	Ü
17.3 Development Management for Renewable Energy Developments	This section outlines that development management advice is included within the draft CDP. With respect to the draft RES, this section summarises some of the key points when developers are considering renewable energy development.	Ü
17.4 Implementing Renewable Energy through the Planning Process	This section highlights opportunities in the development management process for boosting the implementation of renewable throughout the county. Various technologies are broadly positive across receptors, particularly PHH, MA and CC, however there is also potential for direct and indirect negative effects as well.	Ü
Chapter 18 – Community Energy		
RES 18.1 Community engagement in community energy initiatives throughout County Clare	<p>Objective RES 18.1 A is largely an administrative objective and is positive for PHH, CG, CCM, CCA and MA along with some indirect negative impacts may arise to the natural and built environment due construction or inappropriate siting of infrastructure.</p> <p>Objective RES 18.1 B focusing on increase in RE will have positive impacts on PHH, CF, CMM, CCA and MA through improved security of energy supply and reduction of GHG emissions. There is also potential for negative impacts to BFF, W, LS, AQ, Lands and CH during the construction stages.</p> <p>Objective RES 18.1 C is overall positive for local communities as it aims to provide grid connection to local communities.</p>	Ü
RES 18.2 Community energy projects	This objective will have potential for negative impacts to PHH, BFF, W, LS, AQ, Lands and CH during the construction stage related to infrastructure development. Increases in renewable energy however will have positive impacts on PHH, CF, CMM, CCA and MA through improved security of energy supply and reduction of GHG emissions.	Ü
RES 18.3 Community Consultation for energy projects, and community gain	This objective is positive for local populations so that they can gain a detailed understanding of the proposed renewable energy project and how it would affect local residents. It is noted that developers should seek guidance from Clare County Council on the level of consultation required for specific renewable energy projects.	Ü
RES 18.4 Community Gain from Renewable Energy	This objective will have positive impacts on human beings within County Clare. As there is no national guidance on community benefits, consultation on this matter is advised to be undertaken with Clare County Council.	Ü

3.5 SEA Statement

In accordance with Article 16 of S.I. 435/2004, as amended, the Competent Authority is required to prepare a statement summarising:

- How environmental considerations have been integrated into the plan or programmes, or modification to a plan or programme;
- How (i) the environmental report, prepared pursuant to article 12, (ii) submissions and observations made to the planning authority in response to a notice under article 13 and (iii) any consultations under article 14 have been taken into account during the preparation of the plan or programme;
- The reasons for choosing the plan or programme, in light of other reasonable alternatives dealt with; and

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- The measures decided upon to monitor, in accordance with article 17, the significant environmental effects of implementation of the plan or programme.

The main purpose of this SEA Statement is to provide information on the decision-making process for the RES in order to illustrate how decisions were taken, making the process more transparent. In so doing, the SEA Statement records how the recommendations of both the Environmental Report and the Natura Impact Report, as well as the views of the environmental authorities and other submissions received during consultation have influenced the preparation of the final RES. The SEA Statement also provides information on the arrangements put in place for monitoring and mitigation. The SEA Statement will be available to the public, along with the NIR and the adopted RES.

3.6 Appropriate Assessment

In addition to the SEA, there is a requirement under the EU Habitats Directive (92/43/EEC) (as transcribed into Irish law) to assess whether the CDP (which includes the RES), individually or in combination with other plans or projects, is likely to have significant effect on a European site, which includes Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), in view of the site's conservation objectives. The requirement for an assessment derives from Article 6 of the directive, and in particular Article 6(3) which requires that:

“Any plan or project not directly connected with or necessary to the conservation of a site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.”

In recognition of this, an Appropriate Assessment (AA) Screening was carried out, in parallel with the SEA processes on the CDP and the RES. From this it was determined that AA was required and a Natura Impact Report (NIR) was prepared to inform an AA.

The AA took a precautionary approach and assessed the general impacts that would be anticipated from the RES providing the necessary inclusion of mitigation measures.

The NIR and AA determination are available under separate cover.

3.7 Adoption of the Clare Renewable Energy Strategy

The Clare Renewable Energy Strategy 2030 was adopted by Clare County Council as a part of the Clare County Development Plan 2023-2029 on 9 March 2023 and will come into effect from 20 April 2023.

4 INFLUENCE OF THE SEA PROCESS ON THE CLARE RES

4.1 Integration of the SEA Process

The SEA and AA processes have been undertaken in parallel to the preparation of the RES. Thus, from the outset, considerations of the environmental consequences of the policy base have been taken into account. The iterative process ensured that the SEA/AA and the preparation of the RES were integrated in order to meet the environmental objectives and the objectives of the plan. The SEA and AA teams were involved in the:

- Iterative discussion and development of the alternatives;
- Advice and guidance on early versions of the proposed objectives to highlight environmental risks;
- Evolution of policy actions;
- Recommendation of mitigation measures to address the potential impacts arising; and
- Discussions on integration of stakeholder observations and issues raised through public consultation on the draft RES.

Table 4-1 shows how environmental considerations and the input of the SEA and AA have been taken into account in the final RES.

Table 4-1: How Environmental Considerations have been taken into account in the Clare RES 2030

Environmental Consideration	Integration into the Clare RES development Process
Early discussion on policy formation	The SEA/AA teams engaged directly with the RES team at an early stage to raise issues and create awareness on key environmental constraints relating to strategy alternatives and the objectives.
Identification of environmental constraints	The SEA team prepared baseline information on environmental conditions of relevance to the RES, with the focus on SEA environmental topics, including: population, human health, biodiversity, flora and fauna, water, climate, air, land and soil, landscape, cultural heritage, material assets and water. This information was used to focus the SEA objectives, inform the alternatives discussions and the assessment and assess positive and negative impacts associated with the implementation of the proposed RES. It also influenced the development of the SEA monitoring programme by flagging data gaps. GIS analysis was also undertaken to inform the baseline.
Assessment of alternatives	The environmental baseline and objectives were used to identify key sensitivities and inform development and assessment of the alternatives. The SEA team and the RES team liaised on possible alternatives during preparation of the SEA scoping document and subsequently through meetings and discussions.
Recommendation of mitigation measures to address impacts on the wider environment	Mitigation measures were proposed to address negative environmental impacts identified during the assessment process. These included amendments to the wording of objectives in the draft RES and recommendations for changes/ new objectives to reflect protection of the environment (see Section 4.2 which presents the mitigation measures from the SEA and AA processes and clarifies how they have influenced the final RES as adopted).
Required environmental monitoring programme	A monitoring programme was presented in the SEA Environmental Report. This has been amended following statutory public consultation and further discussion with the RES team and will help facilitate the ongoing monitoring of the implementation of the RES.
Consultation	Statutory consultation was undertaken with the environmental authorities for SEA in Ireland in relation to scoping of the SEA Environmental Report. Issues raised were used to inform the overall scope and context of the environmental assessment. Subsequently, the SEA Environmental Report, the Natura Impact Report (from the Appropriate Assessment process) and the draft RES were put on statutory public display by CCC from December 2021 to March 2022. All stakeholder feedback was reviewed and proposed changes arising from the feedback were then assessed under the SEA and AA processes to determine if they would result in any additional significant environmental effects or result in adverse effects to any European site(s) prior to their inclusion in the Plan. A further period of public consultation was undertaken on all changes to objectives and actions comprising material amendments to the RES, from November 2022 to January 2023. These material amendments have also been screened/assessed by the SEA and AA teams to determine if they would result in significant effects (see Section 4.2 and Chapter 5 of this SEA Statement) prior to finalisation of the RES.

4.2 Recommended Mitigation Measures and how they have been addressed in the Final RES

In addition to the influences outlined in **Section 4.1** above, the SEA Environmental Report and the NIR specifically suggested mitigation measures to offset negative impacts identified during the assessment process for the draft RES. These included general measures such as additional text clarifying obligations in relation to protection of European Sites, additional clarity on the definitions/ wording in policies, as well as specific recommendations and suggestions on how to improve the effectiveness of the RES going forward.

Table 4-2 presents the mitigation measures from the SEA and AA processes carried out on the draft RES to outline how they influenced the final RES as adopted. Proposed SEA mitigation is outlined in green text, and the NIR mitigation in blue text.

Table 4-2: SEA and AA Mitigation Measures for the Clare RES

Draft RES Reference	Mitigation Measures
Chapter 1 - Introduction	See mitigation proposed under Chapter 3 following the assessment of the Chapter 3 objective.
Chapter 2 – Legislation and Policy Context	No objectives included – N/A
Chapter 3 – Energy Profile of County Clare	<p>Note – – SEA mitigation is outlined in green, NIR mitigation in red. Where mitigation has been incorporated into the RES, this has been noted</p> <p>General Mitigation – New Objectives to be included in Chapter 1</p> <ul style="list-style-type: none"> Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2022-2028. Mitigation has been incorporated into the Chapter as Objective RES 1.1 A. Date for the CDP has been updated to state 2023-2029. The EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool should be applied to inform decision-making in terms of infrastructural/siting considerations as well as consideration of environmental sensitivities. Mitigation has been incorporated into the Chapter as Objective RES 1.1 B To ensure that RE development proposals support and enhance the connectivity and integrity of habitats in the RES area by incorporating natural features into the design of development proposals; and to work with infrastructure providers to co-develop infrastructural management plans to enhance biodiversity. Mitigation has been incorporated into the Chapter as Objective RES 1.1 C <p>NIR Mitigation</p> <ul style="list-style-type: none"> To require any Renewable Energy project to be in compliance with the objectives and requirements of the Habitats Directive, specifically Article 6(3) and where necessary 6(4), Birds, Water Framework (including the implementation of the 3rd Cycle RBMP), and all other relevant EU Directives and all relevant transposing national legislation. Mitigation has been incorporated into the Chapter as Objective RES 1.1 D To require project planning for any Renewable Energy project to be fully informed by ecological and environmental constraints at the earliest stage of project development and any necessary assessment to be undertaken, including assessments of disturbance to species and habitats, as required. Any ecological assessment shall also be required to consider ecological connectivity and potential supporting habitats to European Sites. Mitigation has been incorporated into the Chapter as Objective RES 1.1 E To require the preparation and assessment of all planning applications for Renewable Energy projects to have regard to the information, data and requirements of the Appropriate Assessment Natura Impact Report, SEA Environmental Report and Strategic Flood Risk Assessment Report of the County Clare CDP 2021- 2028 Development Plan and SEA of the Renewable Energy Strategy.

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Draft RES Reference	Mitigation Measures
	<p>Mitigation has been incorporated into the Chapter as Objective RES 1.1 F</p> <ul style="list-style-type: none"> • Ensure that no RE projects are permitted that give rise to significant cumulative, direct, indirect or secondary impacts on the integrity of European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects, (either individually or in combination with other plans, programmes, etc. or projects) (Except as provided for in Article 6(4) of the Habitats Directive, viz. There must be: a) no alternative solution available, b) imperative reasons of overriding public interest for the project to proceed; and c) Adequate compensatory measures in place). <p>Mitigation has been incorporated into the Chapter as Objective RES 1.1 G</p>
Chapter 4 – Summary of Renewable Potential, Resources and Targets	<p>General Mitigation As per Chapter 3 - new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p>
Chapter 5 – Energy Conservation and Efficiency	<p>General Mitigation As per Chapter 3 - new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendments to Objectives</p> <ul style="list-style-type: none"> • RES 5.1 A: To contribute towards the EU wide target of achieving at least 32.5 % improvement in energy efficiency in line with national policy, proper planning and sustainable development. • RES 5.1 F: To encourage a high standard of sustainable energy efficiency and conservation in the existing building stock by encouraging developers, owners, and occupiers to improve the environmental performance of buildings and to promote the uptake in incentives, schemes, grants or other available funding to improve energy efficiency in line with national policy, proper planning and sustainable development. • RES 5.1 G(b): Promoting retrofitting of existing buildings to achieve a high level of energy conservation, energy efficiency and use of renewable energy sources in line with national policy, proper planning and sustainable development. • RES 5.1 G(h): To identify significant ‘waste’ energy sources in County Clare and to promote and facilitate the capture and conversion of such energy to a usable resource for local consumption in line with national policy, proper planning and sustainable development. <p>Wording to policies not taken on board, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1 A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p>
Chapter 6 – Onshore Wind	No objectives included – N/A

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Draft RES Reference	Mitigation Measures
Chapter 7 – Solar	<p>General Mitigation</p> <p>As per Chapter 3 – new objectives to be included in Chapter 1. <i>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</i></p> <p>Proposed New Objective</p> <p>It is an objective to undertake a feasibility study/strategy in relation to solar farm development within County Clare. The study would outline all of the potential environmental and technical (grid connection) constraints and/or opportunities associated with solar development at the identified sites allowing CCC to plan ahead to ensure planned development of solar infrastructure across the county and avoiding potential for cumulative environmental impacts on landscape, landuse etc. and allowing for proper planning and sustainable development.</p> <p>Mitigation has been addressed via the SEA Monitoring Programmes for the CDP and RES, which now includes for better oversight of the trend between applications submitted and projects built out. The monitoring includes for tracking where decoupling is occurring between the two metrics, for solar in particular, and includes a remedial action for CCC to liaise with EirGrid/ESB and other stakeholders as relevant to identify bottlenecks in projects moving through the systems.</p> <p>Proposed Amendments to Objectives</p> <ul style="list-style-type: none"> • RES 7.1: <i>Increase the penetration of commercial scale solar energy projects in line with national policy, proper planning and sustainable development.</i> • RES 7.2: <i>Promote integration of solar energy in line with national policy, proper planning and sustainable development.</i> <p>Wording to policies not taken on board, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1 A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p>
Chapter 8 – Bio-energy	<p>General Mitigation</p> <p>As per Chapter 3 – new objectives to be included in Chapter 1. <i>All general mitigation measures have been included in draft RES Chapter 1 as part of RES 1.1</i></p> <p>Proposed New Objectives</p> <p>Suggest adding new objectives as follows:</p> <ul style="list-style-type: none"> • To support initiatives for energy research funding and to encourage the development of bioenergy opportunities, facilities and associated rural enterprises in the countryside in appropriate locations where such activities do not have a significant negative impact on the environment and where they assist in the diversification away from fossil fuels to green energy. <i>Mitigation has been incorporated into the RES 8.1 objective as RES 8.1 C</i> • Planning applications for biomass crops such as willow or miscanthus will consider potential environmental effects in relation to land use changes and in particular will assess potential for likely significant effects on European sites and other environmental sensitivities as identified by the EPA Environmental Sensitivity Mapping (ESM) Webtool and the Appropriate Assessment GeoTool. Sustainable best practice in the growing of biomass and in the associated forestry management shall be required: <ul style="list-style-type: none"> • The planning of biomass will be in accordance with the following guidance: Miscanthus Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011); and • Short Rotation Coppice Willow Best Practice Guidelines, Teagasc and Agric Food and Biosciences Institute (April 2011) <i>Mitigation has been incorporated into the RES 8.1 objective as RES 8.1 D</i>

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Draft RES Reference	Mitigation Measures
	<ul style="list-style-type: none"> It is an objective to monitor any land use change due to biomass/energy crops to ensure avoidance of impacts to the receiving environment including biodiversity and agriculture. Mitigation has been incorporated as new objective RES 8.6 <p>Proposed Amendment to Objective</p> <ul style="list-style-type: none"> RES 8.4 B: To promote the installation of district heating schemes <i>in line with national policy, proper planning and sustainable development.</i> <p>Wording to policy not taken on board, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1 A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p>
Chapter 9 – Marine Renewables	<p>General Mitigation</p> <p>As per Chapter 3 – new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed New Objective</p> <ul style="list-style-type: none"> To undertake a feasibility study of infrastructure (port, onshore grid, landfall locations etc) in relation to any new port development. The study would outline all of the potential environmental and technical (grid, depth of water) constraints and/or opportunities associated with port development at the identified sites allowing CCC to plan ahead to enable/facilitate offshore energy in line with national policy, proper planning and sustainable development. <p>Objective not added. Mitigation has been addressed by way of the supporting text in Chapter 9 – Marine Renewables, under Section 9.4 (Policy), which states the following: <i>Clare County Council will seek to plan ahead for offshore energy development. Early consideration of the following factors will be beneficial:</i></p> <ul style="list-style-type: none"> Opportunities to improve or expand port facilities to enable offshore investigation and construction processes, and for servicing future wind farms Identification of constraints and opportunities for landfall locations where renewable energy is brought ashore, harnessed, delivered to the domestic market, and integrated with the wider pan-European energy generation and transmission system Implications for the electricity grid, gas grid and transport infrastructure to enable good alignment with offshore energy resources to be considered Environmental sensitivities and constraints, to ensure that development does not come at an unacceptable cost to the environment and heritage of the county to be considered Enterprise and employment opportunities, and how to maximise local benefit from new offshore investment to be considered. The potential and negative impacts of development on the commercial activities and livelihoods of those in the fisheries industry will be recognised and evaluated through consistent engagement with fishing interests and communities throughout the planning and development consent process. <p><i>This forward planning will be carried out by means of feasibility studies, in partnership with government and relevant state agencies.</i></p> <p>Proposed Amendments to Objectives</p> <ul style="list-style-type: none"> RES 9.1 A, RES 9.2 B and C should also include the following at the end of the Objective: ...<i>and in line with national policy, proper planning and sustainable development.</i> <p>Wording not included, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1</p>

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Draft RES Reference	Mitigation Measures
	<p>A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p> <ul style="list-style-type: none"> • RES 9.3 A should be amended to state: To work in partnership with the marine renewable energy sector (wave, tidal and offshore), DECC, EirGrid and other relevant stakeholders to deliver the key actions recommended by the Ocean Renewable Energy Development Plan (ORED P) and DS3 Programme, ensuring that electricity generated off the coast of County Clare can be exported to the demand market subject to the requirements of all environmental legislation and in accordance with the OREDP SEA Environmental Report and the Natura Impact Report. Mitigation has been incorporated as part of the objective.
<p>Chapter 10 – Microgeneration</p>	<p>General Mitigation As per Chapter 3 - new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed New Objective</p> <ul style="list-style-type: none"> • To require all planning applications for new buildings in the residential, industrial, commercial and agricultural sectors throughout County Clare to demonstrate how the energy needs of the proposed development can be provided for with indigenous renewable energy resources, harnessed by incorporating micro renewable technologies, as an important element in establishing a low carbon County and assisting in meeting assigned renewable energy targets. Mitigation has been incorporated as new objective RES 10.2 C • All planning applications must be accompanied by an environmental appraisal outlining the potential impacts and required mitigation measures to reduce impacts on the natural environment and any potential impacts on architecture. <p>New objective not included, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1 A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p>
<p>Chapter 11 – Micro Hydroelectric Power</p>	<p>General Mitigation As per Chapter 3 - new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objective</p> <ul style="list-style-type: none"> • RES 11.1: To facilitate the development of micro hydro power developments on a case by case basis, where proposals comply with requirements of the Habitats Directive, Birds Directive, the relevant River Basin District Management Plan, the provisions of the Clare County Development Plan 2023 - 2028, with the 'Guidelines on the Planning, Design, Construction and Operation of small scale hydro electric schemes and Fisheries' (DCENR and Inland Fisheries Ireland) and other related legislation/ guidance that is available, in accordance with proper planning and sustainable development. Proposed amendments have been incorporated. <p>Proposed New Objectives</p> <ul style="list-style-type: none"> • An Ecological Impact Assessment should identify all ecological factors, including ecological corridors, be accompanied by appropriate surveys, undertaken at the correct time of year and be undertaken by a suitability qualified and experienced ecologists. Details of the habitats impacted by the MHP will be required, including descriptions of protected species recorded and mapping of habitat locations and extents. The habitat mapping should be in accordance with best practice guidance.

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Draft RES Reference	Mitigation Measures
	<p>A version of the mitigation has been incorporated as part of RES 11.2</p> <ul style="list-style-type: none"> There are a number of plant species protected under the Flora Protection Order, 1999, which may potentially occur in some of the identified areas. Also, there are breeding sites and resting places of otter, and potentially of bats, (both of which are strictly protected under S.I. No. 477 of 2011, as amended), within the MHP areas this will require both survey for these and to comply with the Wildlife Acts and Regulations. <p>A version of the mitigation has been incorporated as part of RES 11.2</p> <ul style="list-style-type: none"> Development of MHP must be undertaken in a sustainable manner with regard to the fisheries resources within the river. Developments of MHP must ensure that they do not impede the ability for fish to migrate upstream. Should a weir be required to be constructed in order to manage the flow to the turbine, a fish pass will be required to be integrated to ensure that there is an attractive upstream path for the fish. Each fish pass will be required to be designated in accordance with the fish species contained within the relevant river. All fish passes should be agreed with IFI. <p>A version of the mitigation has been incorporated as part of RES 11.2</p> <ul style="list-style-type: none"> Consultation will be required with the IFI in relation to the development of any of the MHP sites identified in this strategy. <p>Mitigation has been incorporated as part of RES 11.2</p> <ul style="list-style-type: none"> A full archaeological, architectural and/or landscape assessment may be required in relation to any proposed application in relation to MHP. <p>Mitigation has been incorporated as part of RES 11.2</p> <ul style="list-style-type: none"> Any micro hydro development shall adhere to the overarching environmental objective RES 1.1. <p>New objective not included, as wording would need to be duplicated across all objectives. RES objectives RES 1.1 A to RES 1.1 G are stated once and apply to all RES projects/developments.</p> <ul style="list-style-type: none"> Any micro hydro power development shall be subject to the appropriate hydrological, hydromorphological and environmental assessments as required. In addition, the cumulative effect of multiple hydro power developments shall be considered at earliest stage within planning and design process. <p>Objective not included. The supporting text in the RES acknowledges the need for environmental assessments, and makes reference to both sensitive sites more broadly, as well as European sites, stating following: <i>It is noted that some sites may also be located in or in proximity to sensitive sites (including European sites). As such, any proposal for hydro-power development would need to be subject to a feasibility or technical study, as well as detailed environmental assessment and subject to the outcomes of the planning process at project level.</i></p>
Chapter 12 – Renewable Heat	<p>General Mitigation</p> <ul style="list-style-type: none"> As per Chapter 3 - new objectives to be included in Chapter 1. <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <ul style="list-style-type: none"> Recommendation: As biomass is currently the dominant fuel source for RES-H, planning applications for biomass crops would need to consider potential environmental effects in relation to land use changes and in particular will assess potential effects European sites, NHAs and pNHAs. <p>With regard to the recommendation, the supporting text under Section 8.4.3 (Energy Crops) states the following: <i>Any planned or future developments in relation to use of crops for bio-energy would need to be assessed in detail on a project by project basis, and subject to feasibility/technical studies and appropriate environmental assessments in the first instance.</i></p> <p>Proposed Amendment to Objective</p> <p>RES 12.4 A: <i>To protect wells, aquifers and other water courses in the development of shallow geothermal resources in accordance with the National River Basin Management for Ireland 2018-2024 2022-2027 and otherwise in accordance with the requirements of the Water Framework Directive, the Habitats Directive and Birds Directive.</i></p> <p>Proposed amendments have been incorporated.</p>
Chapter 13 – Renewable Transport	<p>General Mitigation</p>

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Draft RES Reference	Mitigation Measures
	<p>This chapter should include reference to the <i>National Policy Framework on Alternative Fuels Infrastructure for Transport 2017-2030</i> which is noted to have undergone SEA and AA.</p> <p>This has been included in supporting text.</p>
Chapter 14 – Waste Resources to Energy	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objective</p> <ul style="list-style-type: none"> • RES 14.2: The Planning Department assessing applications for AD plants should consider requesting traffic management plans. A version of the mitigation has included reference to traffic management plans. • RES 14.6: To support the Southern Region Waste Management Plan Authority and the policies and objectives contained in any future Regional Waste Management Plan and to investigate the feasibility of energy recovery associated with the processing of MSW subject to compliance with environmental legislation. Proposed amendments have been incorporated.
Chapter 15 – Energy Storage	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objectives</p> <ul style="list-style-type: none"> • RES 15.1: To facilitate, where possible, forms of Energy Storage, including pump hydro-electric, battery and thermal energy storage and other forms of innovative energy storage that improves overall electricity grid resilience and stability. This includes facilities for green hydrogen production and storage in line with national policy, proper planning and sustainable development. • RES 15.2: Within the Indicative Area identified on Map 15.1, to facilitate the development of Pumped Freshwater Hydroelectric Energy Storage, subject to satisfactory environmental protection and in line with national policy, proper planning and sustainable development. <p>Wording to policies not taken on board, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1 A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p> <p>Proposed New Objective</p> <ul style="list-style-type: none"> • Any development of PHES shall adhere to the overarching environmental objective RES 1.1. <p>New objective not incorporated, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1 A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p> <ul style="list-style-type: none"> • Any PHES development shall be subject to the appropriate hydrological, hydromorphological and environmental assessments as required. In addition, the cumulative effect of multiple hydro power developments shall be considered at earliest stage within planning and design process.

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Draft RES Reference	Mitigation Measures
	<p>Objective not included. The wording of the objective RES 15.2 (PHES Proposals) acknowledges the need for environmental assessments more broadly, and states: <i>Within the Indicative Area identified on Map 15.1, to facilitate the development of Pumped Freshwater Hydroelectric Energy Storage, subject to satisfactory environmental protection.</i> The overarching environmental objectives of RES 1.1 A to RES 1.1 G applies to all RES projects/ developments.</p>
<p>Chapter 16 – Supporting Infrastructure</p>	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1. This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objective</p> <p>RES 16.1E: <i>To facilitate the expansion or upgrading of existing infrastructure, including roads, ports, piers, power lines and substations etc. to support the development of renewable energy projects in line with national policy, proper planning and sustainable development.</i></p> <p>Wording to policy not taken on board, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1 A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p>
<p>Chapter 17 – Environmental Considerations & Development Management Advice</p>	<p>General Mitigation</p> <ul style="list-style-type: none"> In order to avoid the potential for cumulative effects, the Planning Department assessing new applications should consider requesting traffic management plans which should include assessments of other nearby operations. <p>Mitigation partially taken on board. Reference to traffic management plans is included with respect to AD facilities in Objective RES 14.2 A: <i>Where practical, adjacent to the national or regional road network and where traffic considerations are acceptable and the road network has adequate carrying capacity and in compliance with the provisions of the National Development Plan. A traffic management plan may be required.</i> The supporting text for this objective also note that planning applications for AD plants should be accompanied by traffic impact assessment and road safety audits.</p> <ul style="list-style-type: none"> In order to avoid the potential for cumulative effects on the natural environment it is recommend that CCC monitor landuse change as a result of RE developments for the duration of the RES. <p>The SEA Monitoring Programme for both the CDP and the RES includes a Monitoring Objective with an indicator to monitor land use change; refer to Chapter 7 of this SEA Statement. Objective RES 8.6 was also added as a result of an SEA recommendation as follows: <i>To explore ways to monitor land use change, particularly in relation to energy crops, forestry and other energy related changes that may have implications for land-use, landscape and biodiversity across the County.</i></p> <ul style="list-style-type: none"> Table 17.2 should include a new measure to require the planning Department assessing new applications for RE infrastructure to consider the cumulative effects of any planned or permitted developments in the county on the receiving environment. <p>Mitigation partially taken on board. Objective RES 1.1 G refers specifically to developments taking account of cumulative effects, in relation to European sites: <i>Ensure that no renewable energy projects are permitted that give rise to significant cumulative, direct, indirect or secondary impacts on the integrity of European Sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects, (either individually or in combination with other plans, programmes, etc. or projects) (Except as provided for in Article 6(4) of the Habitats Directive...</i></p> <p>Wind energy developments are also considered to be one of renewable energy project types that have major potential for cumulative effects. Under Chapter 6 – Onshore Wind, Section 6.6 Policy, states the following: <i>The existing Wind Energy Strategy for County Clare is incorporated into the Clare County Development Plan 2017-2023 (Volume 6) and forms the policy basis for onshore wind development in the County. The planning authority</i></p>

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Draft RES Reference	Mitigation Measures
	<p>is committed to reviewing the WES once the new National Wind Energy Guidelines are issued. When reviewing the Wind Energy Strategy, Clare County Council will take account of all relevant factors including:</p> <ul style="list-style-type: none"> • Landscape capacity and visual impacts, including cumulative impacts; ... <p>In addition, cumulative issues are also covered in the Clare CDP 2023-2029.</p>
<p>Chapter 18 – Community Energy</p>	<p>General Mitigation</p> <p>As per Chapter 3 - new objectives to be included in Chapter 1.</p> <p>This mitigation has been incorporated into Chapter 1 as Objective RES 1.1 A-G</p> <p>Proposed Amendment to Objective</p> <p>RES 18.1 B: To encourage community owned renewable energy projects across County Clare, availing of support available through SEAI to develop the concept and design, and availing of community RESS auction funding for project implementation in line with national policy, proper planning and sustainable development.</p> <p>Wording to policy not taken on board, as wording would need to be duplicated across most objectives. It is considered that Chapter 17 – Environmental Considerations & Development Management Advice sets out the strategic aims of the RES, and also in particular Table 17.1 – Overview of Development Management Aspects summarises some of the key requirements when individuals, communities or companies are considering renewable energy development, which also include reference to planning and environmental legislation. Objectives RES 1.1 A to RES 1.1 G also cover the key environmental concerns and apply to all RES developments, with RES 1.1 A specifically requiring: <i>Any proposals for RE infrastructure shall comply with Chapter 17 Environmental Considerations & Development Management Advice and the overarching policies and objectives of the Clare County Development Plan 2023-2029.</i></p>
<p>Cumulative Effects</p>	<p>As above for Chapter 17 – Environmental Considerations & Development Management Advice</p>

5 HOW CONSULTATION FEEDBACK HAS INFLUENCED THE CLARE RES

This chapter outlines how submissions and observations on the Environmental Report, Natura Impact Report and draft RES (and material amendments) have been taken into account in the evolution of the RES.

5.1 Clare CDP Issues Paper

As part of the first phase of public consultation on the CDP (including the RES), CCC invited submissions on an Issues Paper between 18 September 2020 to 16 November 2020, resulting in 194 total submissions/observations received, of which 59 related specifically to wind energy and a further 36 related to other forms of renewable energy. A Chief Executives' Report was prepared on the submissions received in relation to this round of public consultation, dated 15 January 2021. All documents are available online on the CCC website at: <https://clarecdp2023-2029.clarecoco.ie/stage1-predraft/>

5.2 SEA Scoping Phase

Scoping helps to focus the SEA on important issues such as those relating to existing and potential environmental issues and problems, under the headings as specified in the SEA Directive and Regulations (as amended), namely: biodiversity, flora and fauna; population, human health and quality of life; soil and geology; water; air and climatic factors; material assets; cultural heritage including architectural and archaeological heritage; and landscape.

As outlined in **Section 3.3** above, an SEA Scoping Report for the Clare RES was initially published for statutory environmental authorities in April 2021 for four weeks (4 May 2021 deadline for response to scoping report). A summary of the issues raised on the RES SEA Scoping report is provided in Chapter 3 of the SEA Environmental Report on the draft RES. An online meeting was also held with representatives from the NPWS on the 22 June 2021.

5.3 Key issues raised in Public Consultation on the Draft RES

The draft RES, included as Volume 5 to the draft Clare CDP 2023-2029, along with the SEA Environmental Report for the draft RES, and the Natura Impact Report were put on public display from 10 December 2021 to 28 March 2022. In total 1,015 responses were received, of which 21 had observations/comments in relation to the draft RES. These included submissions from members of the public, NGOs, other state bodies/agencies, private companies and the SEA statutory environmental authorities.

The key issues raised and details of how the submissions have been considered and addressed in the RES is included in the Chief Executive's Report to the Elected Members on submissions received on the Draft Clare County Development Plan 2023–2029, dated 10 July 2022. The full report is available on the CCC website at: <https://clarecdp2023-2029.clarecoco.ie/stage2-draft/report-submissions/>

5.4 Key issues raised in Public Consultation on the Material Amendments to the Draft RES

Following consideration of the Draft CDP, as well as the draft RES, the Chief Executive's Report on submissions and the Chief Executives Report on Member's Resolutions (November 2022), it was resolved by the Elected Members on 20 October 2022 to amend the Draft CDP, as well as the draft RES. As a number of these amendments constituted a 'Material Alteration' and CCC resolved to place the Material Amendments back on public display.

These proposed amendments were required to have regard to and be informed by the SEA and appropriate assessment processes. These proposed amendments, including the "Addendum to the Environmental Assessments and Report (Volume 10 (a) Natura Impact Report & 10 (b) Strategic Environmental Assessment Environmental Report)", went on public display from the 28 November to 3 January 2023. With regard to the RES, it was considered there would be no significant environmental effects arising from the proposed amendments to the RES.

In total, 170 (plus an additional 11 late submissions received after the consultation closing date).

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A Chief Executives Report on submissions received in relation to the proposed amendments together with the associated Addendum to the Environmental Assessment was submitted to the Elected Members on 28 November 2022 for their consideration. This is available on the CCC website at: <https://clarecdp2023-2029.clarecoco.ie/stage3-amendments/report-submissions/>

6 PREFERRED SCENARIO AND REASONS FOR CHOOSING

6.1 Approach to Alternatives for the RES

Alternatives can be described as a range of options available to the plan makers for delivering on the objectives of the RES, as well as alternatives within the strategy itself. The identification of alternatives enables more informed decision-making and the assessment allows more sustainable options to be identified. The alternatives to be considered must be realistic, reasonable and relevant. It is anticipated that the environmental report will explore alternatives at a number of levels: strategic, policy objectives, GIS analysis and environmental mapping overlays, etc.

Recent EPA guidance on development of alternatives provided a framework for development of alternatives; **Table 6-1** adapts Figure 10-1 from the EPA report *Good Practice Note on SEA for the Energy Sector* (EPA, March 2021) on possible approaches to alternatives with example considerations for the RES. The alternatives were developed by the SEA and RES team and were presented to and discussed with key members of Clare County Council.

Key considerations by Clare County Council and RPS in the development of each alternative strategy were identified and incorporated in the description of each alternative. The key considerations included:

- **Community Acceptance of Energy Infrastructure:** Key issues include community consultation at an early stage, raising awareness of renewable energy and linking to health, well-being and social and economic development.
- **Economic Impact and Job Creation:** Impacts on economic development through increased economic activity as measured by Gross Value Added. The creation of new supply chains or the expansion of existing systems. Job creation is also an important criterion of economic activity.
- **Energy Security and Climate Change:** Capacity of the project(s) to contribute to alternative and sustainable energy supply that will reduce the counties and/or Ireland's dependence upon imported fossil fuels. The ability to displace fossil fuels will also reduce the CO₂ emissions associated with energy use and impact upon regional and national commitment on carbon reductions.
- **Energy Infrastructure Capacity/ Development:** Capacity of the grid to accept the levels of electricity capable of being generated by renewable means; requirement for close liaison with EirGrid in regard to Grid 25 Strategy, project proximity to grid connection.
- **Land Use Change:** A growing demand for fuel to serve the renewable energy industry (e.g. woodland and energy crops as biomass) may change agricultural practices and create new demands on rural areas.
- **Ecological and Environmental Impact:** Impacts on designated sites, flora, fauna, air, water, soil and peat.
- **Landscape Characteristics:** Issues surrounding an established landscape character and the potential visual impacts.

As part of the development of alternatives RPS undertook a series of workshops to consider reasonable, implementable and realistic options to see how County Clare could achieve meeting the renewable energy targets set for Ireland.

Table 6-1 provides an overview of the emerging options that were considered throughout these workshops by the SEA team, the RES team and representatives from Clare County Council. Potential alternatives were also issued to the key stakeholders for feedback and their comments/recommendations were taken on board in the development of the alternatives.

The reasonable alternatives are discussed and assessed in **Sections 6.1 to 6.3** below.

Table 6-1: Potential Approaches to the Development of the Alternatives for the RES

Alternative Type	Description	Example Considerations with respect to the RES
Strategic	<p><i>High-level options that achieve a given objective.</i></p> <p><i>These types are commonly realistic only at policy level.</i></p>	<p>Do Nothing – this alternative would mean that the 2015 RES is not updated or incorporated into the 2023-2029 CDP.</p> <p>Business as Usual – More renewable electricity projects, gradual change to renewable heating systems, gradual progress to renewable transport energy, continuation of the existing RES progress. Development of renewable energy largely led by private companies.</p> <p>National Pathway – Clare would achieve its share the national targets across renewable energy sectors. More aggressive decarbonisation of heat and transport in particular. Would include for example:</p> <p>Greater deployment of renewable electricity on land incl. further onshore wind and solar and associated electricity grid projects.</p> <p>Electrification of heating and transport creating the need for localised electricity grid upgrades. Switching over to electric heat pumps in homes and business.</p> <p>Increased use of biofuels/ biomass in both transport and industry.</p> <p>Wide uptake of micro-generation and community energy.</p> <p>Maximise Renewable Resources – Going beyond the national targets to achieve greater decarbonisation, linked to enterprise and industrial development by creating a stable and reliable low-carbon energy environment. Similar to 'National pathway' but with more large-scale renewable electricity projects both onshore and offshore.</p> <p>More rapid decarbonisation of heat and transport.</p> <p>More emphasis on energy conversion and energy systems integration – e.g. using battery storage, hydrogen electrolyzers, and pumped-hydro energy storage systems.</p> <p>Attracting energy-intensive employment (e.g. Data Centres) to form part of a low-carbon energy network.</p>
Spatial/ Geographical	<p><i>Alternative locations for the implementation of planning objectives.</i></p>	<p>Marine Sector Priority – more renewable infrastructure to develop tidal, wave and offshore wind capacity. Would include more off-shore cabled/ grid, more foreshore works, and more industry in coastal areas</p> <p>On-Shore Focus – greater use of wind, solar, and biomass resources. Will include land use changes, more utility-scale renewables and energy integration and storage installations.</p>
Modal	<p><i>Different technical/ mode alternatives to achieve the same objective</i></p>	<p>Different technical/ mode alternatives to achieve the same objective can be considered under the 3 main target headings of Electricity (E), Heat (H) and Transport (T).</p> <p>Alternatives may include:</p> <p>RES-Electricity:</p> <p>Onshore Wind v Onshore Solar</p> <p>RES – Heat:</p> <p>Bioenergy focus – growing more energy crops and more district heating and biomass boilers, more AD (biogas) plants possibly with District Heating, versus</p> <p>Electricity Focus – fewer landuse implications (strengthening of electricity distribution network, more rooftop solar PV, more heat pumps)</p> <p>Gas grid focus – decarbonisation of gas grid – more AD plants, hydrogen facilities e.g. near wind farms. Use of CHP in centralised heat systems, possibly with District Heating.</p> <p>RES-Transport:</p> <p>Electric Vehicle focus: this is the preferred national approach for car fleet.</p>

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Alternative Type	Description	Example Considerations with respect to the RES
		Biofuel focus: possible alternative for HGVs and similar larger vehicles: implications more growing of biofuels (e.g. oilseed rape), more AD plants (biogas), more importation of bio-ethanol and biodiesel.
Sectoral and/ or Temporal Prioritisation	<p><i>Alternatives that look at sectoral feasibility and needs at the strategic level, policies can be formulated to promote one sector versus another.</i></p> <p><i>Alternatives for the timing of implementation of plan/ programme measures.</i></p> <p><i>These are most suitable at the local level for addressing infrastructure development.</i></p>	<p>Sectoral Contribution:</p> <p>Utility Scale Sector Renewables (e.g. large installations of wind, solar, biomass) supplying the electricity grid, versus</p> <p>Community (e.g. community owner solar, wind projects) and Household sector (e.g. microgeneration of renewable energy in households, with some feed-in of excess energy to the grid)</p> <p>Other alternatives that look at sectoral and temporal feasibility could include:</p> <p>Consideration of alternatives which are not currently feasible in this 2nd iteration of the plan but may become feasible/ economically viable in the future e.g. tidal power, advanced biofuels.</p> <p>Consideration of the timing of different modes of renewable energy throughout the life-time of the RES i.e. Onshore wind and Solar in earlier years and offshore towards the later years</p>

6.1 Temporal/Prioritisation Alternatives

6.1.1 Alternative 2A – Onshore Priority

This option would prioritise the development of onshore RE infrastructure including solar, wind, hydro, biofuels etc. As it utilises tried and trusted approaches, it involves less risk and uncertainty.

6.1.2 Alternative 2B – Marine (Offshore) Priority

This option would prioritise the development of offshore RE infrastructure and primarily focus on off-shore wind farms in combination with smaller wave and tidal installations tidal. Under this approach, the long term delivery of large scale offshore energy would be seen as preferable to continued prioritisation of onshore energy which brings land use and environmental pressures.

6.1.3 Alternative 2C – Combination of Onshore plus Planning for Offshore

This option would prioritise the development of onshore RE infrastructure only including solar, wind, hydro, biofuels etc. in the short-medium term, but would plan for much more extensive offshore renewable energy in the offshore in the long term (post-2030). The only elements of onshore development that would be considered as part of this option would be the associated ancillary works to grid connection and the ports.

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6.1.4 Assessment of Options

Table 6-2: SEA Assessment of Temporal/Prioritisation Alternatives

Alternative	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
2A Onshore Priority	+/-	-	-	-	+/-	+	+	+	-	-	+	This option would be heavily reliant on further developing onshore wind and solar farms throughout the county and therefore would have negative impacts largely associated with the capacity of the landscape and landuse to accommodate the change. Indirect impacts to water and BFF would also be likely through increased pressure on ecological corridors, water quality, spread of invasives etc. Whilst positive impacts to CF would occur, they may not be realised to their full potential with reliance on onshore technologies. Certain technologies may also result in negative impacts to air quality through increased traffic during operation or construction for example. Positive impacts to PHH would occur through employment, security of supply but again negative impacts during the construction phase would be likely.
2B Marine (Offshore) Priority	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	The development of offshore only would in the first instance place greater pressure on the marine environment on BFF, Water, seabed and seascapes, in contrast it would relieve existing pressure on BFF, LandS and aquatic watercourses by diverting RE infrastructure away from the terrestrial environment. There is a risk that by preceding with offshore only the RES would not meet the national targets as some of the technologies are still in testing phase and the planning process to facilitate offshore and the construction of the RE infrastructure may not be achieved by the targets dates of 2030.
2C Combination of Onshore plus Planning for Offshore	+/-	+/-	+/-	+/-	+/-	+	+	+	+/-	+/-	+	This alternative focuses on a number of possible technologies to meet renewable energy targets including both onshore and offshore. It is not reliant on the offshore infrastructure to be in place to meet the targets but rather for the associated infrastructure (port, grid, roads) to be planned for so when the time comes to provide i.e. the offshore development Clare County Council are in a position to move forward. This option is therefore considered favourable in terms of progressing the onshore RE but also for planning and

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Alternative	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
												<p>setting County Clare up to be ready for facilitating offshore development.</p> <p>Whilst this alternative is favourable in relation to the provision of renewable energy technologies within County Clare as with the other alternatives there are uncertainties in the potential impacts that each type of technology could have on the environment. In relation to MA there are overarching positive impacts from the generation of employment, protection of agricultural land through the number of renewable technologies proposed and the protection of infrastructure as again there are a number of options within this alternative. It is also positive as it will in the long term reduce the reliance on shore wind and associated impacts on landuse, BFF and landscape capacity. Negative impacts however may arise from construction works associated with the RE infrastructure including any dredging of ports that maybe required, provision of substations, grid connections etc.</p>

Key: *PHH* – Population and Human Health; *BFF* – Biodiversity, Flora and Fauna; *LS* – Soils and Geology; *W* – Water; *AC* – Air Quality, *CF* Climatic Factors; *CCM* – Climate Change Mitigation, *CCA* Climate Change Adaptation, *MA* – Material Assets; *CH* – Cultural Heritage; *LandS* – Landscape.

6.2 Modal Alternatives

These alternatives examine the scope and combination of different RE technology types for meeting the RE vision of the Clare CDP and the objectives of the draft RES.

6.2.1 Alternative 3A – Mixed-use Technology as per the Existing RES

This alternative identifies a combination of familiar technologies identified in the first RES to support the renewable energy needs for County Clare under the three main target renewable energy source headings of Electricity (RES-E), Heat (RES-H) and Transport (RES-T).

For example, under RES-E, the targets could be achieved from a combination of solar, wind, hydropower etc. Under Alternative 3A, the draft RES 2022-2030 would continue to utilise the preferred modal approach from the previous RES, which took forward combined technologies as well as efficiency in demand.

6.2.2 Alternative 3B – Expanded Modal Scope

This alternative revises the mix of potential technologies that can deliver the RES targets, including new approaches to energy storage and conversion. The modal scope from the existing RES was expanded to consider new technologies such as utility scale solar, energy storage technologies, energy conversion via hydrogen etc.

6.2.3 Assessment of Options

Table 6-3: Assessment of Modal Alternatives

Alternative	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
3A Mixed use technology as per the existing RES	+	0/-	0/-	0/-	+/-	+	+	+/-	0/-	0/-	+/-	<p>This alternative scenario would continue with energy efficiency measures and conservation which would continue to be included along with a number of different technology options.</p> <p>This scenario provides a reasonable spread of RE options for County Clare and it also ensures that there is flexibility should certain options not be feasible in relation to impacts on the environment. Therefore there are positive impacts on many of the SEOs, particularly MA, CF/CCM/CCA and PHH.</p> <p>However it is acknowledged that there will be some negative environmental impacts on some environmental objectives due to the development of RE in general, and particularly where this occurs on greenfield compared to existing built-up or industrial areas. There are some long-term negative aspects for MA and CCA in the sense that this option fails to consider newer RE technologies.</p>
3B Expanded Modal Scope	+	0/-	0/-	0/-	+/-	+	+	+	0/-	0/-	+	<p>Option 3B is similar to Option 3A in that it considers a range of modal options for delivering on RE targets. The LARES (2013) sieve analysis methodology was again applied during the preparation of the draft RES 2022-2030, taking stock of the maximum RE resource possible, filtering down to modes that are technically possible, and finally those that are accessible and planned, which takes a balanced view of other competing interests (such as environmental constraints).</p> <p>Further, the draft RES has had regard to the <i>Clare Energy & Emissions Balance for 2010</i>, published by the Limerick Clare Energy Agency in 2012. This was subsequently updated by the RES plan team in 2021 following the same methodology but in addition, updating it with Clare's energy needs to 2020, and predicting to 2030. This takes account of</p>

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Alternative	PHH	BFF	LS	W	AQ	CF	CCM	CCA	LandS	CH	MA	Comment/Mitigation
												<p>Ireland's National Energy & Climate Plan (NECP) and that plan's <i>with additional measures</i> (WAM) scenario. This analysis has helped in the consideration of the best modal options for Clare going forward based on the latest information. In this regard, technologies such as energy storage solutions, utility-scale solar and energy conversion have been considered and included in the draft RES, expanding on the scope of the current RES.</p> <p>As for Option 3A, there are neutral to negative direct and indirect impacts on environmental objectives, as RE development can impact on BFF, W, LS, LandS and CH in the short, medium and long term depending on the technology type. AQ is mixed as reduced fossil fuels can be expected to lead to air quality improvements however fuels such as biomass are still carbon-based and undergo combustion. RE development overall has direct positive long term impacts on MA, CF, CCA and CCM.</p>

Key: **PHH** – Population and Human Health; **BFF** – Biodiversity, Flora and Fauna; **LS** – Soils and Geology; **W** – Water; **AC** – Air Quality ; **CF** Climatic Factors; **CCM** – Climate Change Mitigation, **CCA** Climate Change Adaptation, **MA** – Material Assets; **CH** – Cultural Heritage; **LandS** – Landscape.

6.3 Sectoral and/or Temporal Prioritisation Alternatives

A number of aspects were also considered in relation to how the RE infrastructure would be delivered. One such measure was the consideration of utility scale sector only which would rely on RE infrastructure being generated from large commercial scale installations (e.g. wind, solar, biomass) supplying the electricity grid from commercial or industrial organisations.

Another aspect considered was focusing on communities and households which could include e.g. community owner solar, wind projects and from the Household sector could include microgeneration of renewable energy in households, with some feed-in of excess energy to the grid. Whilst both options would contribute to meeting RE targets, acting individually utility scale development would not serve to meet the community needs of Clare and if community/household based sector was only was brought forward it is likely that the stringent targets set for 2030 would not be met. It was concluded that a combination of both would best serve the needs of the communities in Clare whilst also meeting Clare's commitments to meeting RE targets for 2030.

6.4 Overall Preferred Strategy and Reasons for Choosing

Option 1A is not considered preferable as without significant drive in relation to plans and policies there is the possibility that renewable energy targets may not be met and that reduction in GHGs would not be extensive in meeting targets.

There is very little difference in terms of the potential impacts associated with alternative 1B and 1C in that both aim to meet the national renewable energy targets with option 1C being slightly more ambitious. Given that County Clare is currently meeting the Renewable energy Targets for electricity it is considered that **Option 1C** is preferred subject to strict planning controls as set out the CDP and the RES.

Option 2C is considered the most preferable alternative under Temporal/prioritisation as it does not rely heavily on either onshore or offshore but rather a combination of both. It also aims to move County Clare in the direction of setting itself up in the future to explore opportunities for offshore wind or tidal.

Option 3B is the preferred alternative under the Modal alternatives. While Option 3A and the current RES contain a good diversity of modal options, it does not take account of newer technologies which have become feasible in the interim period since it was published. The draft RES also considers the latest information and updated energy balance for Clare, as well as having regard to national measures such as the NECP. By expanding the scope of modal options, there will be better diversity of choice and support, better balance and resiliency to changes, as well as security of energy supply.

The overall preferred option is therefore a combination of **1C**, **2C** and **3B** with a combination of community/household and utility-scale RE development.

7 MEASURES TO MONITOR SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE IMPLEMENTATION OF THE ADOPTED RES

Article 10 of the SEA Directive requires that monitoring should be carried out in order to identify at an early stage any unforeseen adverse effects due to implementation of the RES, with the view to taking remedial action where adverse effects are identified through monitoring. A monitoring programme is developed based on the indicators, which enable positive and negative impacts on the environment to be measured. The environmental indicators of relevance to the RES were identified from the SEA process. These are intended to be used to show changes that would, as far as possible, be attributable to implementation of the RES.

7.1.1 Sources of Information for Monitoring

Where possible, indicators have been chosen based on the availability of the necessary information and the degree to which the data will allow the target to be linked directly with the implementation of the RES. The monitoring proposed for the RES also aims to tie-in to the monitoring within the CDP. **Table 7-1** presents the Environmental Monitoring Programme to track progress towards achieving SEOs and reaching targets and includes sources of relevant information.

It is the responsibility of CCC to coordinate the monitoring of their CDP and RES, however it is acknowledged that CCC will, to a large extent, rely on existing monitoring programmes managed by, for instance, other relevant departments/ sections within the local authority itself, as well as other agencies (e.g. EPA). It remains the responsibility of CCC to liaise with data holders to get the data and to report on the monitoring of the CDP and RES.

It is acknowledged that remediation of any unforeseen effects is likely to require a more integrated response across authorities, agencies and departments and to fully establish the correct response/actions should such effects be identified.

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Table 7-1: SEA Monitoring Programme

Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
Monitoring Objective 1: <i>Reduce the need to travel/increased use of public transportation and achieve modal shift in transport across the county.</i>	<p>An increase in the percentage of the population travelling to work, school or college by public transport or sustainable modes of transport (walking, cycling).</p> <p>Decrease in proportion of journeys made by private fossil fuel-based car compared to 2016 National Travel Survey levels</p>	<i>Decrease in the current known levels of private fossil fuel-based transport and an overall increase in sustainable modes.</i>	<ul style="list-style-type: none"> % Increase in the number of people reporting regular cycling/walking to school and work above 2022 CSO figures. Consultations with Department of Communication Climate Action and Environment together with statistics produced by the Regional Assembly as part of the preparation of the Regional Spatial Economic Strategy for the Southern Region. CSO data – review of statistics as published. 	<p>CCC Forward Planning section review of CSO figures in relation to car journeys and mode of transport.</p> <p>Results from National Travel Survey.</p>	<p>Consultation with the Department of Education, TII and local public transport providers to identify sustainable opportunities for a modal shift in transport.</p> <p>Investigate if awareness of new transport routes, timetables and services is the issue for a lack of progress towards achieving this objective.</p>
Monitoring Objective 2: <i>Decrease the usage of fossil fuels and increase both renewable resource usage with a move towards more low carbon energy sources.</i>	<ul style="list-style-type: none"> Progress on implementing CDP objectives to demonstrate successful implementation of climate reduction targets as provided for by Plan provisions including those provided for and referenced in Chapter 1 “Climate Action”, as well as the objectives as set out in the Clare RES 2030. Contribution to the transition to a competitive, low-carbon, climate-resilient and environmentally 	<p>Increasing trend in 1) the numbers of renewable energy developments and 2) those granted permission and 3) connected to the grid.</p> <p>Increasing trend in energy efficiency for buildings.</p> <p>Decreasing trend in use of fossil-fuels across sectors.</p> <p>Decreasing trends in fossil-fuel based transport.</p>	<p>No. of:</p> <ul style="list-style-type: none"> Applications submitted for renewable energy projects, including no. of MW. Connected projects (i.e. built-out), including no. of MW. Successful applications for RESS to capture projects coming forward for power purchase agreements (includes wind, solar and a separate category for community projects). Monitoring these metrics annually to track whether permissions granted are staying coupled to applications submitted then connected. <p>No. of solar rooftop connections.</p>	<p>CCC Forward Planning section in conjunction with the Climate Action Regional Office, Limerick Clare Energy Agency – annual.</p> <p>ESB and EirGrid – Published lists of projects connected to the grid by RES type. EirGrid – RESS applications, updated with every auction, typically annually.</p> <p>SEAI – Grant aid data by county for rooftop solar.</p> <p>EPA Corine database – updated every 6 years, and National Land Cover</p>	<p>Review of the CDP/RES measures/ objectives if targets are not being achieved, as part of the next CDP and RES review.</p> <p>Where targets are not achieved, CCC will liaise with the Regional Assembly, the EPA and the Climate Action Regional Office to establish reasons and develop solutions.</p> <p>Where the numbers of consented RES developments is decreasing relative to the number of applications submitted for planning (with a</p>

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Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
	<p>sustainable economy by 2050</p> <ul style="list-style-type: none"> Reduced energy consumption and supporting the uptake of renewable options and a move away from solid fuels for residential heating. 		<p>Land cover change in hectares – GIS analysis of % land cover change from agricultural uses to others in comparison with 2018 Corine/ National Land Cover (NLC) 2018 figures.</p> <p>Tracking the BER rating average for County Clare, tracked annually for rate of change.</p> <p>No. of Government buildings in Clare meeting the 50% target for public sector bodies.</p> <p>Use EPA Air Quality Monitoring to find areas of high fossil fuel usage in terms of heating homes.</p> <p>No. of SEAI grants for CCC under the Support Scheme for Renewable Heat (SSRH).</p> <p>No. of:</p> <ul style="list-style-type: none"> Electric vehicles registered for CCC as a proxy for gauging uptake. Electric vehicle charging points installed in the county. Other: hydrogen, biomethane, LNG refuelling points. <p>CCC 'M&R' (monitoring and reporting) system – covers energy consumption and carbon emissions.</p>	<p>2018 dataset (OSi/Tailte Eireann).</p> <p>SEAI – FOI request for BER database annually.</p> <p>SEAI Data, Limerick Clare Energy Agency Data, CARO office.</p> <p>EPA Air Quality Monitoring Maps and Air Quality Reports – checked quarterly to track trends.</p> <p>SEAI SSRH data – available online at aggregate level and by county level by request to SEAI.</p> <p>SIMI – EVs registered in Clare.</p> <p>ESB charging points map; GLP AutoGas hydrogen refuelling locations map – checked annually.</p> <p>CCC M&R mandatory reporting to SEAI – CCC to review own data annually on trends. FOI request to SEAI will provide data for other public bodies.</p> <p>CCC Forward Planning – review LA CAP for data</p>	<p>focus on solar projects), CCC Forward Planning will review the decoupling to identify any gaps/ bottlenecks in the planning and consenting and/or grid connection processes, in liaison with ESB/EirGrid and other stakeholders as relevant.</p> <p>Where EPA Air Quality Monitoring indicates areas of consistently reduced air quality as a result of solid fuel burning, target with an awareness campaign in association with the implementation of the Climate Action Plan.</p>

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Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
			Local Authority Climate Action Plan (CAP) Data – statutory requirement under the Planning and development Act, as amended, and the Climate Action Plan 2023.	and monitoring already being (or planned to be) collected to avoid duplication of effort on RES monitoring.	
Monitoring Objective 3: <i>In preparing the spatial plan for our county that we develop ecologically resilient and varied landscapes through the establishment and preservation of ecological networks and stepping-stones as part of our settlement zonings and objectives, and foster adaptive management practices in the face of uncertainty, favouring flexible adaptation options and allowing for alterations of the Plan as monitoring and evaluation data become available during its implementation.</i>	Usage of areas previously un-surveyed by the Local Authority in terms of their importance as ecological networks and stepping stones with a particular focus on sites within our key settlements commencing with Ennis.	<ul style="list-style-type: none"> Establish the usage of sites identified within the environmental assessments as potentially having a biodiversity or ecological importance to protected species such as bats in the first instance. No loss of ecological networks or parts thereof which provide connectivity between areas of local biodiversity without remediation (i.e., planting of the same or greater length of compensatory native hedgerow to ensure no net loss of such features). 	<ul style="list-style-type: none"> Usage of selected sites by bat species as identified through targeted surveys within selected settlements. The length and area of riparian buffer zones, open space and green infrastructure zoned as part of our County Development Plan. The net length of hedgerow retained and supplemented as part of individual planning applications or strategic projects undertaken by the council. 	Clare County Council Forward Planning and Development Management sections co-ordinated through the Environmental Assessment Officer.	<p>Where, following survey and assessment by the Local Authority sites zoned for future development are found to provide important stepping-stones and ecological networks the Plan should be alter at the next available opportunity e.g. Variation to protect these sites.</p> <p>Where encroachment is occurring within these areas, ensure enforcement action is taken to reinstate habitat and associated zoning.</p> <p>Where the loss of ecological networks or stepping-stones is as a result of implementation of objectives contained in the Plan the 2 year review should ensure the associated policies are amended.</p>
Monitoring Objective 4: <i>Integrate Climate Change mitigation</i>	To ensure each zoning parcel across the county as identified through the	Ensure all future development is climate proof or incorporates climate adaptation and	<ul style="list-style-type: none"> Incorporation of measures into Planning Applications and Clare County Council led Plans and Projects. 	Clare County Council Forward Planning and Development Management together with	Enforcement action where measures identified with specific

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Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
<i>measures into every fabric of spatial planning through the restriction of inappropriate development/land-use zoning in flood risk zones, inclusion of green infrastructure as the status quo and the incorporation of suitable Sustainable Urban Drainage Systems (SuDs) into all developments</i>	CDP process has a Climate Action focus.	mitigation measures where appropriate.	<ul style="list-style-type: none"> Implementation of measures on the ground as part of specific projects and developments. To implement the targets as identified in the Renewable Energy Strategy and incorporated into the Clare County Council Climate Action Plan and County Development Plan with respect to achieving a reduction in greenhouse gas emissions and transitioning to a climate resilient county. 	<p>all Departments and Sections as part of their work programme.</p> <p>Climate Action Section facilitated by the Climate Action Co-Ordinator.</p>	<p>zoning objectives are not incorporated on site.</p> <p>Where SuDs, Nature Based Solutions etc are not being incorporated at project level review consenting process and conditions associated with planning permission.</p>
Monitoring Objective 5: <i>Maintain and protect our natural carbon sinks (bogs/marshes/forests/fens/Peatland and Wetlands habitat) as decarbonising areas which can serve a dual purpose in terms of enhancement of biodiversity and mitigation against Climate Change.</i>	<p>No loss of wetlands, bogs, fens, marshes, or other carbon sinks across the county through reclamation, infilling or development.</p> <p>Where pressure exists to develop out these areas monitoring should be prioritised to provide the scientific evidence to support the exclusions of these areas from future development.</p>	<ul style="list-style-type: none"> Undertake targeted assessments/surveys/monitoring of identified natural carbon sinks across the county to include groundwater and surface levels in known wetlands. Avoid situations that limit adaptation to climate change such as zoning lands in close proximity to a known flood risk area. 	<ul style="list-style-type: none"> Change in landuse across the county Protection of key areas of flood plains and associated wetland features Reclamation/Infilling of bogs, fens and other wetland habitats. Monitoring change in land use through utilisation of the Clare County Council habitat mapping together with the Environmental Sensitivity Mapping (ESM) Web-Tool. Where new areas become at risk from flooding due to climate change, further areas may be required for climate adaptation. 	<p>Forward Planning – SEA Officer to map flood events since the publication of the County Development Plan against planning permissions granted to assess if development has taken place within a flood plain, areas prone to flooding or as a result of climate change in areas which have now become prone to flood and therefore may merit a change to zoning within the County Development Plan as a result of monitoring.</p> <p>CCC – Records obtained as and when flood events occur.</p>	<p>Where loss of these important habitats occurs within these areas, ensure enforcement action is taken to reinstate habitat and associated zoning.</p> <p>Review CDP zoning and associated landuse in areas of land directly adjacent to flood prone areas and amend as new information arises.</p>

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<i>Aim for Monitoring</i>	<i>What is being Monitored?</i>	<i>Target</i>	<i>Indicator</i>	<i>Data Source/ Responsibility</i>	<i>Remedial Action</i>
				<p>OPW – As updated on www.floodinfo.ie</p> <p>Where resources allow within these Departments (which won't always be available) spot checks of enforcement/mitigation arising from this Plan should be undertaken against the datasets identified (Clare Habitat Mapping/ESM Tool together with the data collated through the Environmental Database (Clare County Council Planning Department internal GIS data arising from Planning Applications, preparation of Plans and Programmes, ecological studies etc.)</p>	
Monitoring Objective 6: <i>Protect Human Health</i>	Compliance with air quality legislation around the town of Ennis.	<p>To see a marked improvement in the number of exceedance events recorded in the town of Ennis in terms of air quality.</p> <p>To see a reduction in the exceedance of WHO Air Quality standards in the town of Ennis.</p> <p>To see a reduction in the number of water supplies needing remedial action.</p>	<ul style="list-style-type: none"> • Number of exceedances of air quality limits as recorded by the EPA. • Number of Enforcement Actions taken due to breaches by retailers/distributors and the public Under the Air Pollution Act (Marketing, Sale, Distribution and Burning of Specified Fuels) Regulations 2012. • A downward trend in the Ennis Air Quality Index which can be modelled based on freely available public data. 	<ul style="list-style-type: none"> • IQAir Data • www.airquality.ie • EPA Ambient Air Quality Monitoring • EPA Water Supply RAL (updated twice per year) 	Review awareness campaigns/ initiatives in relation to air quality issues to improve knowledge and awareness locally in terms of dangers of smoky fuels.

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Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
			<ul style="list-style-type: none"> Number of water supplies on the EPA Water Supply Remedial Action List. 		
Monitoring Objective 7: To achieve the conservation objectives of European Sites (SACs and SPAs).	<ul style="list-style-type: none"> No loss of protected habitats and species during the lifetime of the Plan. No compromise in the favourable conservation condition of European sites. No compromise or impact on the achievement of the favourable conservation condition objectives (whether maintain or restore) of European sites. 	<ul style="list-style-type: none"> Maintain or restore the conservation status of the habitats and species associated with the designated European sites in County Clare. 	<p>% loss of habitats/displacement of species within European Sites.</p> <p>No negative impacts on sites through the Councils own works or through developments/ licenses/ permissions/ permits granted by the Council.</p> <p>Percentage of Qualifying Interest Features which have achieved their specific objectives of maintain or restore.</p>	<p>Referrals and consultation with NPWS on planning applications and enforcement files.</p> <p>Using GIS query the European sites dataset as provided by the NPWS against planning applications received for the No./% applied for within these areas and the No./% refused/granted.</p> <p>Review the conservation status of the European Sites in Clare against the status as documented in the preparation of the CDP.</p> <p>Where permissions have been granted and/or developments have taken place within European sites are the Qualifying Interest Features achieving their specific objectives.</p> <p>Article 17 Reporting on the Status of Protected Habitats and Species Next report due in 2025.</p>	<p>Where loss of habitats or species occurs within these areas, ensure enforcement action is taken.</p> <p>Review CDP zoning and associated landuse in areas of land directly adjacent to European Sites.</p>

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Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
				Responsibility; Forward Planning, Development Management, SEA Officer.	
Monitoring Objective 8: <i>Meet the requirements of the Water Framework Directive and the River Basin Management Plan.</i>	All waters within the plan area to achieve the requirements of the WFD and the relevant River Basin Management Plan by 2027. Ensure provision of riparian zones at project/site level.	All waters (Surface, Groundwater, Transitional and Coastal) to achieve at least Good Status by 2027.	No. of surface and groundwater bodies achieving “Good Status”. No of waterbodies indicating deterioration in status. No. of planning applications with sufficient inclusion of buffer zones and Sustainable urban Drainage Systems (SuDS) where necessary and applicable (in both urban and rural settings).	Forward Planning and Development Management. SEA Officer to compare WFD status results to the baseline as used in the preparation of the CDP 2023-2029. Utilise EPA WFD Application and Catchments.ie for CCC-specific information on the significant threats and pressures impacting WFD status and Risk.	Revise baseline and review CDP Objectives for waterbodies failing to achieve at least good status or waterbodies which have been identified as Priority Areas for Action.
Monitoring Objective 9: <i>To minimise and, where possible, eliminate threats to biodiversity including invasive species.</i>	Prevent the introduction of new invasive or alien species. Control/manage new invasive species. Control/manage/eradicate invasive species throughout the county.	No increased distribution in the extent of mapped records of alien and invasive species across the county.	<ul style="list-style-type: none"> No., type and location of invasive species identified. No. of actions achieved under the Biodiversity Action Plan. Increase/decrease in coverage of invasive species identified through the Municipal Districts of Ennis, Killaloe, Shannon and West Clare. Each MD have a programme of invasive species eradication underway in September and October with funding from the National Parks and Wildlife Service (Dept. Housing, Local Government & Heritage), National Biodiversity Action Plan Funding 2021. Follow up work will involve further mapping of the problem species, Knotweed and Giant 	Environmental Assessment Officer in conjunction with the Heritage Officer in conjunction with the Municipal District Offices on a yearly basis. National Biodiversity Data Centre – data reported for County Clare.	Where there is no success in reducing stands of alien/invasive species re-assess treatment method and establish new methods if necessary.

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Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
			<p>Hogweed in particular and proposed long term management and control measures.</p> <ul style="list-style-type: none"> No. of submissions/ observations submitted through invasive species Ireland “Alien Watch”. www.invasivespeciesireland.com/alien-watch No of Planning Applications which are accompanied by an Alien/Invasive Species Report and/or requested through the Planning Department to prepare an Alien/Invasive Species Management Plan. The National Biodiversity Data Centre will track success in the implementation of the All-Ireland Pollinator Plan by measuring increases in the abundance and diversity of pollinators within the Irish landscape as the 81 actions are implemented. 		
<p>Monitoring Objective 10: To maximise the sustainable re-use of the existing built environment, derelict, disused and infill sites (brownfield sites), rather than greenfield sites. (This is in line with the Active Land Management Strategy RPO34 –</p>	<ul style="list-style-type: none"> Preference for development on brownfield site over green field. Specified % of new applications granted to be on brownfield sites. Limited and controlled development of greenfield sites. Re-use of soil from redeveloped sites where possible. 	<p>To see a reduction in the development of greenfield sites and the progressive and planned re-use of derelict and disused properties across the county.</p>	<ul style="list-style-type: none"> No/% of new developments on brownfield sites. Area of brownfield land developed over the plan period. % of total greenfield land developed. % landcover change in comparison with 2018 Corine figures. Level of urbanisation or construction within zoned lands 	<p>Forward Planning and Development Management co-ordinated by the Environmental Assessment Officer. Annual through a review of planning applications utilising GIS.</p> <p>Work with the derelict teams in Clare County Council to establish the % re-use of existing buildings.</p>	<p>Where the proportion of growth on infill and brownfield sites is not keeping pace with the targets set in the NPF and the RSES, the Council will liaise with the Regional Assembly to establish reasons and coordinate actions to address constraints to doing so.</p>

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Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
<i>Regeneration, Brownfield, Infill Development)</i>	<ul style="list-style-type: none"> No incidences of soil contamination. 		<p>as per the 2023-2029 County Development Plan.</p> <ul style="list-style-type: none"> Excessive land-filling of quality soil. Incidences of soil contamination. Volume of contaminated material generated in comparison with previous years' figures. 	CCC Environmental Section in conjunction with the EPA	Review of local authority applications for legacy landfill remediation authorisation. Where progress is stalled, CCC to work with the EPA to identify any bottlenecks in the process.
Monitoring Objective 11: <i>To ensure that all zoned lands (existing and proposed) are connected to the public sewer network ensuring treatment of wastewater which meets EU requirements prior to discharge.</i>	Upgrades to existing wastewater treatment plant infrastructure identified within the plan as being insufficient, based on existing and forecasted population demands to meet EU requirements.	<p>To reduce the number of on-site systems across the county.</p> <p>Decreasing trends in the numbers of EPA Priority Urban Areas, number of facilities on the Irish Water Remedial Action List, numbers of areas discharging raw sewage and numbers of plants failing EU treatment standards.</p>	<p>No. of upgraded Wastewater Treatment Plants within the plan area.</p> <p>No. of EPA Priority Urban Areas.</p> <p>No. of plants discharging raw sewage.</p> <p>No. of plants failing to meet EU Sewage Treatment Standards.</p> <p>Number of plants exceeding the Emission Limit Values (ELVs) for Wastewater Treatment Discharge licence set by the EPA.</p> <p>No. of plants added/ removed from the Irish Water Remedial Action List to indicate trends.</p>	<p>Irish Water -Achievement of Water Services Strategic Plan objectives.</p> <p>Irish Water – Remedial Action List (RAL) updated quarterly. CCC Forward Planning Team to check at similar frequency.</p> <p>EPA – Sewage Treatment Maps for Priority Urban Areas, raw sewage discharges, and locations failing to meet treatment standards – CCC Forward Planning annual check.</p> <p>CCC Forward Planning Team – granting of permission conditioned based on a future WWTP upgrade.</p> <p>CCC Forward Planning Team – refusal of</p>	Where planning applications in the settlement strategy are rejected due to insufficient capacity in the Wastewater treatment Plant (WwTP) or failure of the WwTP to meet Emission Limit Values (ELV), CCC will work with the Regional Assembly, EPA and Irish Water to coordinate a response to achieve the necessary capacity.

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Aim for Monitoring	What is being Monitored?	Target	Indicator	Data Source/ Responsibility	Remedial Action
				permission as no upgrade to WWTP due to take place or due to insufficient capacity in the WWTP or failure of the WWTP to meet Emission Limit Values.	
Monitoring Objective 12: <i>Conserve, protect and enhance valued natural, cultural and built landscapes, views of local value and features including those of geological and aesthetic value.</i>	<p>No significant visual impact from development.</p> <p>No damage to designated landscapes or seascapes as a result of the Renewable Energy Strategy.</p> <p>The important landscapes across the County as outlined in Volume 2 of the Clare County Development Plan 2023-2029.</p>	Ensure no significant disruption of historic/cultural landscapes and features through objectives of the County Development Plan.	<p>No. of developments permitted and their impacts on cultural/historic landscapes.</p> <p>No. of developments located within Scenic Route or extent of degradation of areas designated as Heritage Landscapes.</p> <p>No. of developments located within a designated scenic view or high landscape area in County Clare that disrupt views (based on the LCA).</p> <p>Development and application of framework in relation to the application of LCA and their contribution to SEA.</p>	<p>Forward Planning and Development Management sections of Clare County Council through the SEA Officer.</p> <p>Undertake a GIS analysis of the various landscape types across the county to establish the no. of developments permitted within these designations and to assess whether they are causing an impact.</p>	Where landscape is being impacted review CDP objectives for appropriateness and requirement for change.

8 CONCLUSIONS AND NEXT STEPS

The SEA and AA processes carried out during the preparation of the RES have ensured that the potential significant environmental impacts associated with implementation of the strategy have been identified and that these impacts have been given appropriate consideration. Consultation on the draft RES, Environmental Report and NIR has further contributed to the development and finalisation of the adopted RES.

It is envisaged that monitoring and reporting of environmental impacts, both positive and negative, resulting from implementation of the RES will continue over the course of the lifetime of the strategy.

9 ADDENDUM TO THE ENVIRONMENTAL REPORT

9.1 Introduction

This is the addendum to the Environmental Report for the RES. This chapter serves two purposes:

- a. To provide clarification and/or additional information following comments in the submissions received during the consultation periods on the draft RES and Environmental Report; and
- b. To identify where the Environmental Report has been updated in following consideration of comments received in submissions during public consultation.

It should be noted that this document supplements and should be read in conjunction with the original Environmental Report.

The clarifications and additional information contained herein (shown in *italicised blue* text) have been provided in order to increase the usefulness of the document for the public and decision makers. However, the amendments proposed are not of such an extent that changes to the content or outcome of the assessment contained within the Environmental Report will be required.

9.2 Amendments by Chapter

9.2.1 Chapter 1: Non-technical Summary

The following updates are made to the non-technical summary:

9.2.1.1 Section 1.2: Description of the Draft Renewable Energy Strategy (RES) (Chapter 3)

The following section is revised to more accurately reflect the overarching aims of the final RES:

*The Clare County Renewable Energy Strategy to 2030 outlines the renewable energy resource that is deliverable in County Clare. Its vision is consistent with that of the Clare County Development Plan 2023-2029, where it is the **Vision of the RES** an objective of the GDP to position the county as: “A County Clare that is the national leader in renewable energy generation which supports energy efficiency and conservation, and which achieves balanced social and economic development throughout the County and assists in achieving Ireland’s Green Energy target national climate change mitigation targets.”*

...

The draft RES sets out clear objectives and targets for the above technologies and provide a development management framework that enables County Clare to position itself as a front runner in facilitating appropriately located and sustainable renewable energy technology. The draft RES sets out the Council’s objectives until 2030, a key date for Ireland to meet assigned national and European targets for renewable energy generation. ~~The overarching aim of the RES is to support and facilitate Ireland in meeting the current National Renewable Energy Action Plan (NREAP) targets required under Article 4 of Directive 2009/28/EC on Renewable Energy. This outlines binding targets for renewable energy in electricity, heat and transport.~~ The first renewable energy strategy for County Clare (2014) examined all renewable energy options for the County, and set an ambitious vision for Clare to be a leader in the renewable energy sector. New climate action targets are being set at EU and National level, with ambitious renewable energy requirements. This RES sets a path for Clare for the year 2030, and revises the original RES in relation to policy, targets and new technology options.

9.2.1.2 Section 1.5: Review of relevant Plans and Programmes (Chapter 6)

The following section is updated to reflect the addition of key plans and programmes:

A review of plans, policies and programmes relevant to the Draft RES was carried out... The findings of the review helped define the draft objectives for the SEA and informed the assessment of alternatives. Some of the key plans, programmes and policies include:

- Kyoto Protocol;
- EU 2030 Climate and Energy Framework;

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- *Ireland's Transition to a Low Carbon Energy Future (2015-2030) White Paper;*
- *Climate Action and Low Carbon Development (Amendment) Act 2021;*
- *Ireland's Climate Action Plan 2021 and 2023;*
- *National Energy and Climate Plan 2021-2030;*
- *National Renewable Energy Action Plan;*
- *National Adaptation Framework;*
- *National Planning Framework;*
- *National Development Plan (2018-2027);*
- *Offshore Renewable Energy Plan (OREDPA) and OREDPA-2 (due in 2023);*
- *Strategic Integrated Framework Plan for the Shannon Estuary (2013-2020);*
- *Water Framework Directive (2000/60/EC);*
- *EU Habitats Directive (92/43/EEC);*
- *EU Birds Directive (2009/147/EC);*
- *EU Floods Directive (2007/60/EC);*
- *EU Biodiversity Strategy to 2030;*
- *National Biodiversity Action Plan (2017-2021); and*
- *County Clare Biodiversity Action Plan (2017-2023).*

9.2.1.3 Section 1.9: Mitigation and Monitoring (Chapter 10)

The final environmental programme is presented in **Section 7** of this SEA Statement.

9.2.2 Chapter 5: Relevant Aspects of the Current State of the Environment (Baseline)

9.2.2.1 Section 5.6: Biodiversity, Flora and fauna

Section 5.6.12: Peatlands

The text for the peatlands section has been amended to recognise the presence of Fin Lough Bog Proposed natural heritage Area (pNHA). While not an NHA bog, Figure 5.6.7 has been updated to include Fin Lough Bog:

The plan sets national restoration targets for raised bog habitats that require the restoration of the national network of raised bog SACs and Natural Heritage Areas (NHAs)². Within Clare four raised bog NHAs and one raised bog SAC have been identified:

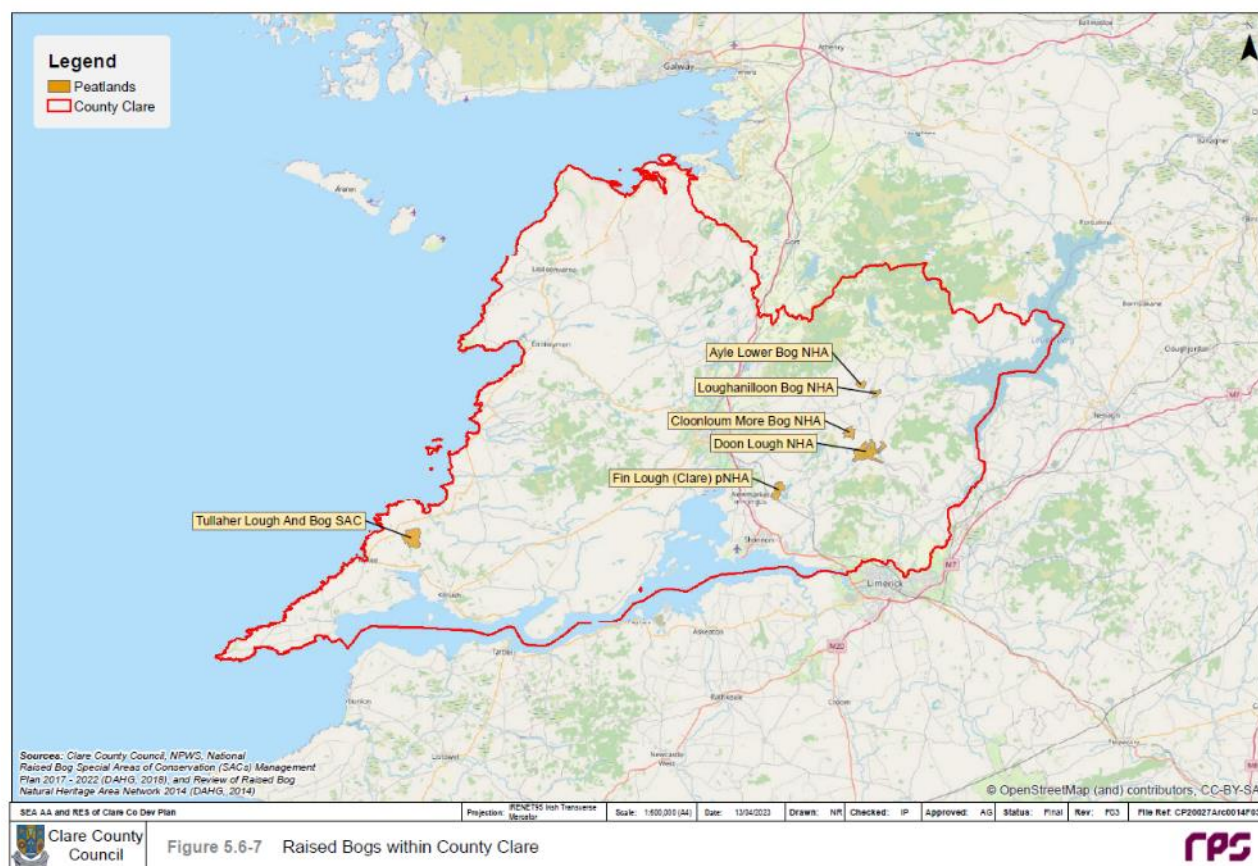
- *Tullagher Lough and Bog SAC – 002343*
- *Ayle Lower Bog NHA – 000993*
- *Loughanilloon Bog NHA – 001020*
- *Cloonloun More bog NHA – 002307*
- *Doon Lough Bog NHA – 000337*

*These 5 raised bogs can be seen in **Figure 5.6-7**. This figure also include Fin Lough Bog, a Proposed Natural heritage Area (pNHA).*

² [https://www.npws.ie/sites/default/files/files/FOR%20UPLOAD%20Plan\(WEB_English\)_05_02_18%20\(1\).pdf](https://www.npws.ie/sites/default/files/files/FOR%20UPLOAD%20Plan(WEB_English)_05_02_18%20(1).pdf)

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It is acknowledged that wetlands, peatlands and bogs have an important role to play in terms of ecosystem services, as such biodiversity features can act as carbon sinks.



9.2.2.2 Section 5.6: Land and Soils

Note that all maps in this section reference 'GSI' in the data source which stands for 'Geological Survey of Ireland'.

The following baseline text is also added to the following sections:

Section 5.6.7: Geohazards

Groundwater Flooding: ... Following the most significant groundwater flooding event to have occurred in Ireland over the winter of 2015/2016, the GSI in collaboration with Trinity College Dublin and Carlow Institute of Technology undertook the GWFlood Project. It aims to help fill the data gaps around understanding the issue of groundwater flooding with the outputs being a project report plus a national data viewer showing historic and predictive groundwater flood maps, as well as live groundwater hydrometric data. The GSI's Groundwater Flooding Data Viewer shows the probabilistic flood extent of groundwater flooding in limestone regions. *GWClimate is the follow-on groundwater monitoring and modelling project to GWFlood and it aims to investigate the impact of climate change on groundwater in Ireland. Data are available online at: <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>*

Section 5.8.5: Quarrying, Minerals & Aggregates

Geothermal Energy: The Geological Society of Ireland (GSI) have produced a national shallow geothermal energy resource map which enables informed decision making and preliminary site suitability assessments. The map and database was developed to meet the limited national, geological information relating to geothermal energy. The mapping indicates that the northeast of the County is suitable for vertical closed loop geothermal technology and open loop commercial technology (see **Figure 5.8 6**). *There are recent publications of relevance for geothermal energy development in Ireland; these include the Roadmap for a Policy and Regulatory Framework for Geothermal Energy (2020) as well as the Assessment of Geothermal Resources for District heating in Ireland, both of which have been developed to support Climate Action Plan commitments and the Programme for Government.*

9.2.2.3 Section 5.9: Air and Climate

Section 5.9.3: Issues and Threats in the Plan Area

Following consultation, the following edits are made to the baseline section on key issues and threats/problems; the edits reflect that CCC cannot claim to be powered by 100% renewables in this context, as the electricity generated by any given county is variously distributed across Ireland's grid network:

*Another threat in the Plan area could be the argument to not pursue renewable projects since Clare is already **generates a significant amount of renewable electricity** within 1% of the 100% renewable energy target. ~~Since all credited renewable electrical energy generated in County Clare is almost equal to the electrical energy consumed in Clare this results in a not zero CO₂ emission factor. However, this assumes that all renewable electricity generated within a county stays within the county. In reality, the electricity generated in any given county, including from renewable sources, is distributed across the country's grid network. The renewable electricity generated in any given county therefore cannot be claimed to cover that county's electricity consumption. It is acknowledged that while CCC can pursue achieving (and exceeding) specific targets in relation to deployment of renewable sources, full decarbonisation of the electricity generation sector is a national-scale ambition. Some counties will also have more renewable resource potential than others (e.g. wind speed potential, increased incidence of solar radiation etc.), therefore the counties that can support greater renewable energy deployment will help contribute to overall national energy and decarbonisation targets.~~*

*In practice, the electricity mix supplied to County Clare will **also** include fossil fuels and there are CO₂ emissions from other sectors. Increasing the generation of renewables within the County will help to reduce **county-level and** national dependence on fossil fuels, so County Clare can still go further to increase Renewable Energy generation.*

Section 5.9.4: What Would Happen to Air and Climate Without the Implementation of the RES?

The following text in this section is amended on foot of the changes to the above:

This Renewable Energy Strategy outlines the potential for a range of renewable resources, including bioenergy and anaerobic digestion, micro renewables, geothermal, solar, hydro, energy storage, onshore and offshore wind, wave and tidal energy. It acknowledges the significant contribution they can make to County Clare being more energy secure, less reliant on traditional fossil fuels, enabling future energy export and meeting assigned targets. Therefore in the absence of a Plan the targets set out at European and national level could slip. ~~In addition the RES sets out a target of meeting the County's Energy Needs from 100% Renewable Sources and in the absence of the Plan this target would be harder to meet and to maintain.~~ Currently the majority of electricity generation in Clare comes from renewable sources in Clare (wind). Less than a 1% share was taken from the national electricity grid. Further without the Plan County Clare would not be a national leader in renewable energy generation. Without the Plan there would be a haphazard approach to renewable energy projects development which could have consequences within the Plan area. Such consequences in the absence of a Plan include the favouring of energy generation from less environmentally friendly sources which would impact negatively on air quality.

9.2.2.4 Section 5.11: Material Assets

Section 5.11.7: Existing Environmental Problems

In response to consultation, the following section has been updated to better articulate further environmental issues related to specific renewable energy projects:

The main issues for the draft RES relating to material assets include the following:

- *Competing land uses;*
- *A shift towards intensification in the agriculture, forestry, fisheries and renewable energy sectors;*
- *Conflicting policy and guidance between sectors;*
- *Inadequate grid connection, port facilities or road network to support RE infrastructure; ~~and~~*
- *In-combination impacts on biodiversity, water, soils, landscape, cultural heritage, soils etc. from competing sectors; ~~and~~*
- ***In terms of specific RES-related issues, the following should be considered:***

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- **Solar:** solar projects at utility-scale can be large in scale and have the potential to have both direct impacts (for example through ground disturbance).
- **Offshore Wind:** Such offshore infrastructure (which can include offshore windfarms, tidal, and wave generators) has the potential to interact with a number of sectors due to competition for space, such as recreational uses and in particular commercial fisheries. Offshore RES development can exclude existing users from an area e.g. fishing grounds. To ensure avoidance of impacts/ conflicts, stakeholder consultation initiated as early as possible is a key consideration.

9.2.2.5 Section 5.12: Architectural Archaeological and Cultural Heritage

Section 5.12.1: Overview of Cultural Heritage Protection in Ireland

The following clarification has been added with respect to world heritage sites versus world heritage properties:

United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Sites (WHS) and Properties

~~The WHS~~ *World Heritage Properties* includes cultural and natural heritage ~~sites~~ *areas* around the world considered to be of outstanding *universal* value to humanity. There are no UNESCO *World Heritage Properties* ~~sites~~ in County Clare however it is noted that The Burren has been submitted by Ireland for consideration *as a site on* the Tentative ~~WHS~~ *World Heritage Site* list.

Section 5.12.2: Archaeological Heritage

The following section has been updated to include an additional reference to a baseline data source in relation to wrecks:

Archaeological heritage is defined as including structures, places, caves, sites, features or other objects, whether on land underwater or in inter-tidal zones. All archaeological structures, constructions, groups of buildings, developed sites, all recorded monuments as well as their contexts, and moveable objects, situated both on land and underwater are part of the Archaeological Heritage. Therefore, the archaeological heritage of the area is not confined to the archaeological sites within the Record of Monuments and Places. It also includes any archaeological sites that may not have been recorded yet, as well as archaeology beneath the ground surface, or underwater as well as the context of any such site discovered.

*There are currently c. 8387 monuments in Clare, which is more than most counties in Ireland. **There are also 37 designated National Monuments within the county and 19 sites subject to a Preservation Order.***

...

*Recent archaeological surveys of intertidal areas in the Shannon Estuary have uncovered a wealth of archaeological material including evidence of prehistoric settlement dating back to 7000BC. There are eight submerged forest locations, three of which represent relict woodland that has been inundated by rising water levels and which can date back far into prehistory. The inventory indicates references to 127 ship wrecking events between the sixteenth and the early twentieth century. However, only 16 wreck sites can be located precisely (SIFP SEA Environmental Report). The INFOMAR programme also maintains a Shipwreck Inventory (2002-2013), and from this inventory only one shipwreck location *from the INFOMAR database* has been mapped in the surrounding waters for County Clare, that of the SS Premier. **In addition, the Wreck Inventory of Ireland Database (WIID) includes all known wrecks over 100 years old, which have full legal protection under the National Monuments Acts (1930–2004). In this database, 207 wrecks are recorded in the waters around Co. Clare.***

Section 5.12.4: Existing Environmental Problems

In response to consultation, the following section has been updated to better articulate the environmental issues related to specific renewable energy projects:

Significant development pressures may vary depending on the location within the Plan area.

Development on sites adjoining protected monuments, places or structures can also impact the setting of these cultural heritage items. In addition the archaeological monuments in the Burren are continually facing pressure through encroachment of scrub vegetation.

In this context, the key issues associated with the implementation of the draft RES and cultural heritage relate to:

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- *Effects on cultural, architectural and archaeological heritage features in the vicinity of proposed RE infrastructure. In terms of specific RES-related issues, the following should be considered:*
 - *Wave and tidal energy projects: Such projects have the potential for direct impacts to maritime/ underwater archaeology and cultural heritage through disturbance of the seabed.*
 - *Micro Hydro and Pumped Hydro: Both technologies would require alteration to existing rivers or watercourses creating potential for direct impact to underwater archaeological heritage.*
- *Potential for disturbance of previously undiscovered archaeological remains near or within development of RE infrastructure development sites.*
- *Impacts to setting and cultural heritage rich areas such as the Burren and the Shannon Estuary.*

9.2.2.6 Section 5.13: Landscape

Section 5.13.7: Issues and Threats in the RES Area

In response to consultation, the following section has been updated to better articulate the environmental issues related to specific renewable energy projects:

Key existing pressures for landscape relate to:

- *Developments which impact on designated landscape(s); in terms of specific RES-related issues, the following should be considered:*
 - *Solar: solar projects at utility-scale can be large in scale and have the potential to have indirect impacts on visual impacts or impacts.*
- Impacts on landscape character as a result of infrastructure and changes in land use/ cover;
- Impacts on cultural heritage resources and visual interactions between heritage and landscape setting/ character;
- Impacts on natural heritage resources and tourism assets which are dependent on the adjoining landscape setting;
- Impacts on tourism/recreation areas; and
- Cumulative impacts arising from multiple development pressures.

9.2.3 Chapter 6: Review of Relevant Plans and Programmes

Section 6.3.1.3: National Context

The following additions are made to this section to reference some of the more recent key plan/programme updates:

*The **Climate Action Plan 2021 (DECC, 2021)**, required under the Climate Action and Low Carbon Development (Amendment) Act 2021, was published in November 2021 and provides a sectoral roadmap to delivering the national climate objective. This Plan replaces the Climate Action Plan (2019) and commits €125 billion of capital investment in low-carbon technologies and infrastructure up to 2030. The Plan identifies 475 actions across all sectors and commits to a more ambitious delivery of renewable energy as well as a focus on the Built Environment and Transport objectives. The plan also includes a commitment to deliver a just transition and includes supports and actions to maximise citizen engagement with the Plan including the establishment of the National Dialogue on Climate Action (NDCA).*

*The **Climate Action Plan 2023 (DECC, 2022)** is the second annual update to Ireland's Climate Action Plan (2019). It builds on the previous climate action plans and is the first plan to implement economy-wide carbon budgets and sectoral emissions ceilings agreed in July 2022. The updated Climate Action Plan focuses on how to achieve the required system change across society and the economy. The plan requires, by 2030, a 75% reduction in electricity sector emissions, 45% reduction in commercial/public buildings emissions, a 40% reduction in residential buildings emissions, 50% reduction in transport sector emissions, 35% reduction in industry emissions and 25% reduction in agricultural emissions. The plan requires a large-scale deployment of renewables and includes an acceleration of the delivery of onshore wind to 9GW, solar energy to 8GW and offshore wind to at least 5GW. In addition, the plan outlines support for at least 500MW of local community-based renewable energy projects and increased levels of micro-generation and small-scale generation.*

...

Ireland's **Offshore Renewable Energy Plan (ORED)** establishes a framework for the sustainable development of Ireland's offshore renewable energy potential. Under the ORED, Ireland is developing a suite of world class test infrastructure to encourage the development of our offshore renewable energy potential.³ The plan was published in 2014 by the Department of Communications, Energy and Natural Resources (now the Department of the Environment, Climate and Communications [DECC]). *The interim report indicates that the ORED is generally still fit for purpose given the low level of activity to date, anticipated activity projected as far as 2020, and the state of play of technology development.*⁴ In 2022, the Government began the process of developing a second Offshore Renewable Energy Plan (ORED-2), due to be published in 2023.

...

The Renewable Energy Directive (2009/28/EC) required Ireland to adopt a **National Renewable Energy Action Plan (NREAP)**. Ireland's plan was submitted to the EC in 2010 and established a 16% RES target in 2020 for Ireland that would be delivered by achieving three modal targets as follows:

- 40% renewable share of electricity use (RES-E);
- 12% share of renewable heat (RES-H); and
- 10% renewable share of transport energy (RES-T).

Table 6.3.1 shows the progress on the renewable energy targets by mode in Ireland.

Looking ahead to 2030, the proportion of energy from renewable sources will have to dramatically increase to meet EU targets under the Recast RES Directive, which is part of the **EC's Clean Energy for All Europeans Package**, and which are to be incorporated as part of Member States' NECPs. While the national target has not yet been finalised, **Table 6.3.1** below present a possible set of targets across electricity, heat and transport sectors, following the 'With Additional Measures' projection set out in the NECP 2021-2030. *The Renewable Energy Directive is currently being further revised to accelerate the take-up of renewables and deliver the urgent emission cuts that are required to meet the EU's increased climate ambitions. It is expected this EU target will be further increased to 45% by 2030 from the current target of 32%.*

Section 6.3.4: Spatial Planning

The following text is added to clarify the status of the Wind Energy Development Guidelines:

At national level, the **Wind Energy Development Guidelines [WEDG's] (2006)**, issued under Section 28 of the Planning and Development Act [PDA] 2000 (as amended) set out advice to planning authorities on planning for wind energy through the development plan process and in determining applications for planning permission. The guidelines aimed to ensure consistency of approach throughout the country in the identification of suitable locations for wind energy development. In December 2019, the then-named Department of Housing, Planning and Local Government (DHPLG) published **Draft Revised WEDG's (2019)** which aim to establish clearer guidance to facilitate the achievement of wider renewable energy targets while considering community, spatial planning, energy policy, environmental, technological and industry issues that need to be balanced. The "preferred draft approach" focuses on several key aspects including:

- Sound/ Noise;
- Visual Amenity Setback;
- Shadow Flicker;
- Consultation Obligations;
- Community Dividend; and
- Grid Connections.

³ Offshore Renewable Energy Development (ORED) – Interim Review, DOECC (2018) | <https://www.gov.ie/en/publication/e13f49-offshore-renewable-energy-development-plan/> (Accessed 02/06/2021)

⁴ Offshore Renewable Energy Development (ORED) – Interim Review, DOECC (2018) | <https://www.gov.ie/en/publication/e13f49-offshore-renewable-energy-development-plan/> (Accessed 02/06/2021)

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It should be noted The Draft Revised WEDG's (2019) were subsequently revoked in December 2022 in light of changing legislation at European level (REPowerEU Plan (COM/2022/230 final)) and national level (National Energy Security Framework). The government are currently working on a new set of revised guidelines due to be published in 2024. Once finalised, the Revised WEDG's will be issued under the PDA and will apply to planning applications and considerations for future wind energy development proposals. These guidelines are of relevance to the RES in terms of the key environmental aspects to be considered as part of wind energy development, such as noise and shadow flicker considerations, as well as setback distances.

9.2.4 Chapter 9: Mitigation and Monitoring

The final environmental programme is presented in **Section 7** of this SEA Statement.



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