



Draft Clare County Development Plan 2023–2029

Volume 5 Clare Renewable Energy Strategy

Proposed Amendments

28th November 2022



COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL



Volume 5 Clare Renewable Energy Strategy

Amendments are proposed to the following sections of Volume 5 Clare Renewable Energy Strategy:

- Executive Summary
- Chapter 3 Energy Profile of County Clare
- Chapter 4 Summary of Renewable Potential, Resource and Targets
 - Section 4.3 Renewable Energy Resource – Unconstrained
 - Section 4.4 Renewable Energy Resource – Technical & Practical
 - Section 4.5 Renewable Energy Resource – Accessible & Planned
- Chapter 9 Marine Renewable
 - Section 9.2.3 The Offshore Renewable Resource
 - Section 9.3 Assessment of Potential of the Offshore Wind Resource
 - Section 9.4 Policy

All proposed amendments are set out below. All other sections and objectives in the Clare Renewable Energy Strategy remain as per the Draft Clare County Development Plan 2023-2029 (dated 10th December 2021).

Proposed additions to the text are set out in green font (sample) and proposed deletions are indicated in red font with a strike through the text (~~sample~~).

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)	Strong Significant progress (153MW installed), enabling Clare to supply enough electricity to meet its own initial needs. 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 hydroelectric 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 70% 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	64.2 128.3	14.7 29.3
8	Energy Crop (SRC-Miscanthus)	87.5 175.0	20.0 39.9
12	Geothermal	34.0	15.0
10	Micro-Thermal	175.7	92.8
Sub Total		361.4 513.0	142.4 177.0
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	230.0 460.0	29.2 58.3
Sub Total		293.0 523.0	37.4 66.6
Electric			
6	Onshore wind	1,590.0	550.0
9	Offshore wind		
7	Solar	226.0 2,260	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 4,711.9	921.7 1010.7
13	Transport	204.0 14.0	29.1 2.0
Overall Total Renewable Target		3536.3 5,761.9	1,167.3 1,219.6
<i>(Of which Community and Citizen owned elements)</i>		459.1	110.3

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 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.

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 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 consumers¹. 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)².

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

¹ Those consumers authorised to hold Kyoto units in an account on Ireland's National Emission Trading Registry

² National Energy Climate Action Plan, DECC (2021)

Table 3.1 County Clare Energy Consumption by Use³

County Clare	2020	2030	2050
Total Final Energy Demand	GWh/y ⁴	GWh/y	GWh/y
Thermal Energy	1,507	1,041	1,162
Electric Energy	722 1,427	914 1,299	1,297 1,041
Transport	1,427 722	1,299 914	1,041 1,297
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

³ Clare Energy and Emissions Balance Update 2021)

⁴ 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)

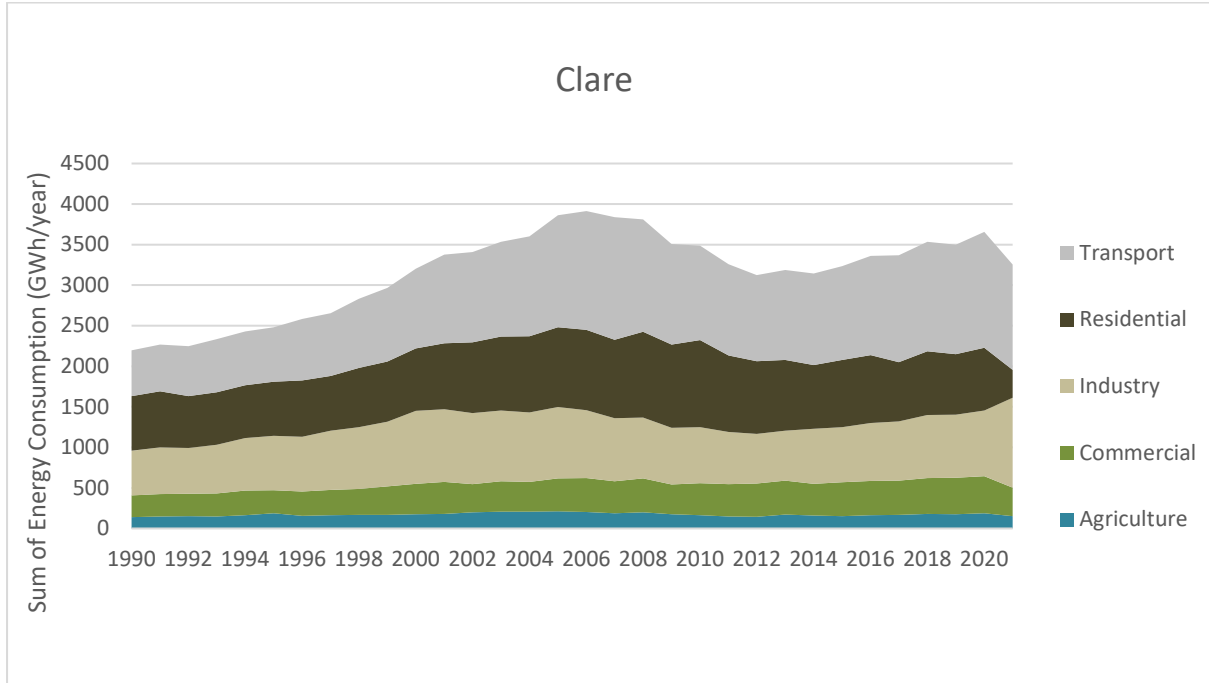
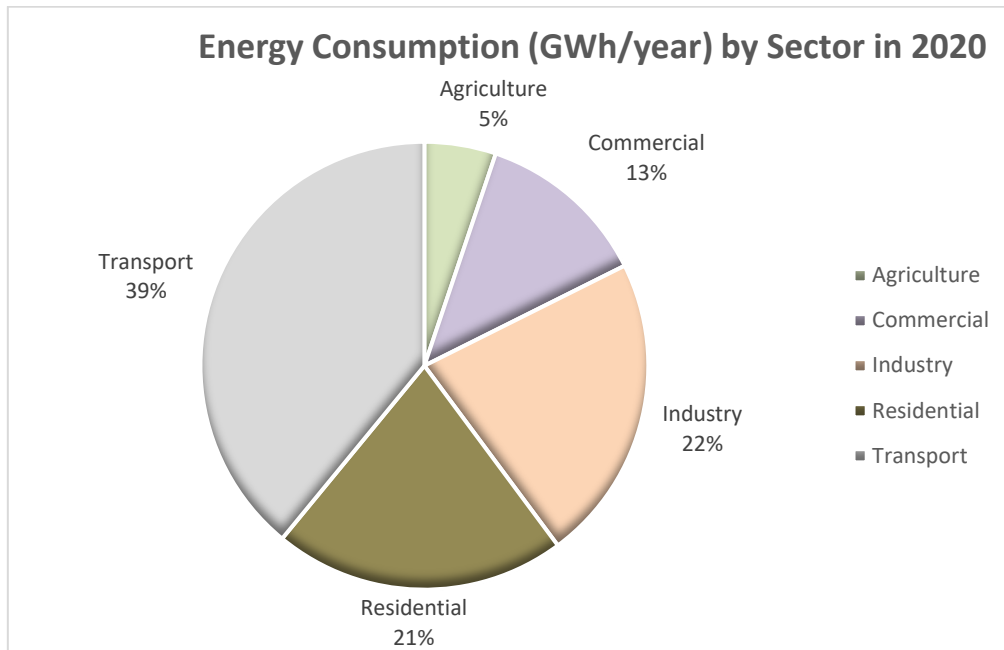


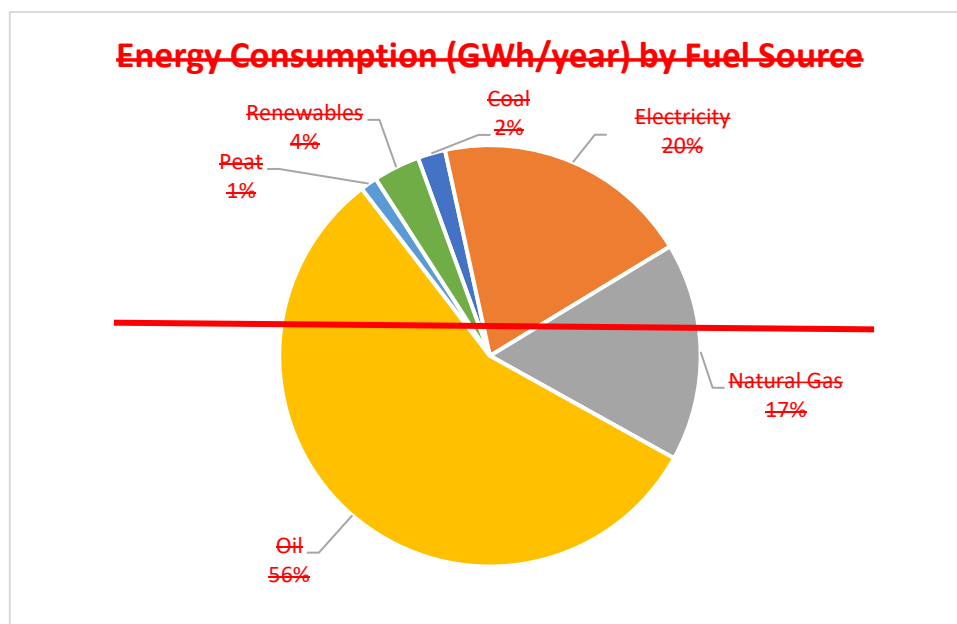
Figure 3.2 outlines in pie-chart form, the energy sector use for the year 2020. The transport and residential sectors constituted 62% of total energy consumption in County Clare during that year.

Figure 3.2 County Clare Total Energy Consumption by Sector – 2020



Having considered previous trends and future energy needs of the County, it is also necessary to assess the types of fuel that are used to meet the needs of the County and to analyse future needs. In this regard, Figure 3.3 shows that oil represented the largest quantity of energy by fuel in 2020, at 2,066 GWh/y or 56% of County Clare's energy demand. This is illustrated in Figure 2.3 below. County Clare does not have any oil reserves therefore the County is entirely dependent upon imported fuel for heat and transport.

Figure 3.3 Energy Consumption by Fuel Source – 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 Source⁵

(All figures in GWh/y)

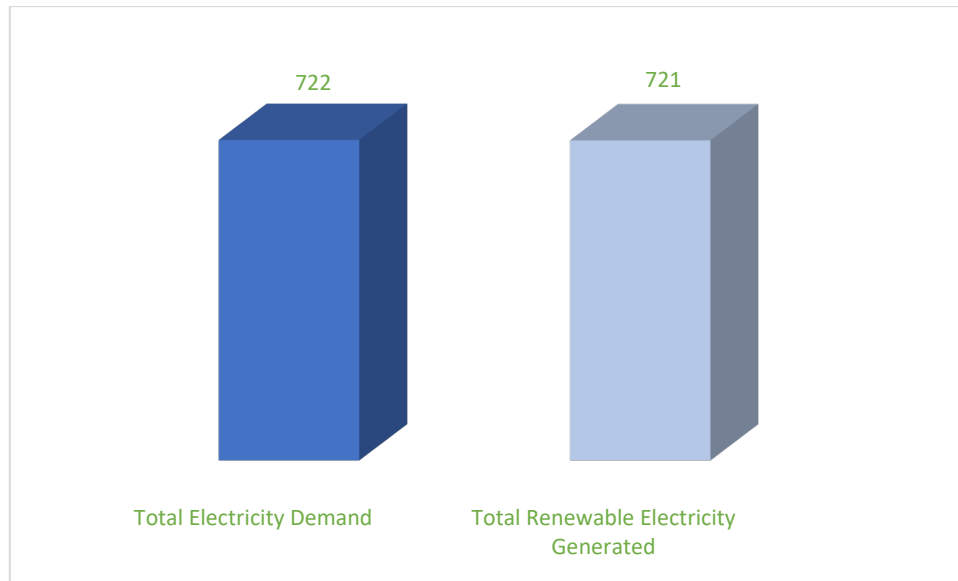
Year	Oil	Electricity	Natural Gas	Coal	Peat	Renewables	Grand Total
2000	1,997	563	382	127	92	41	3202
2005	2,452	664	439	157	83	67	3862
2010	2,038	660	500	121	76	94	3489
2015	1,752	669	534	108	60	111	3234
2020	2,066	722	613	78	47	130	3656
2030	1,396	914	496	47	10	391	3,253

~~The Energy Emissions Balance shows that the total electricity demand in Clare in 2020 was 722 GWh and the total renewable electricity generated in Clare was 721 GWh. If the local produced renewable energy is allocated to Clare first, then there is 1 GWh of electricity which still needs to be met. In practice, the electricity mix supplied to County Clare will include fossil fuels and there are CO₂ emissions from other sectors.~~

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.

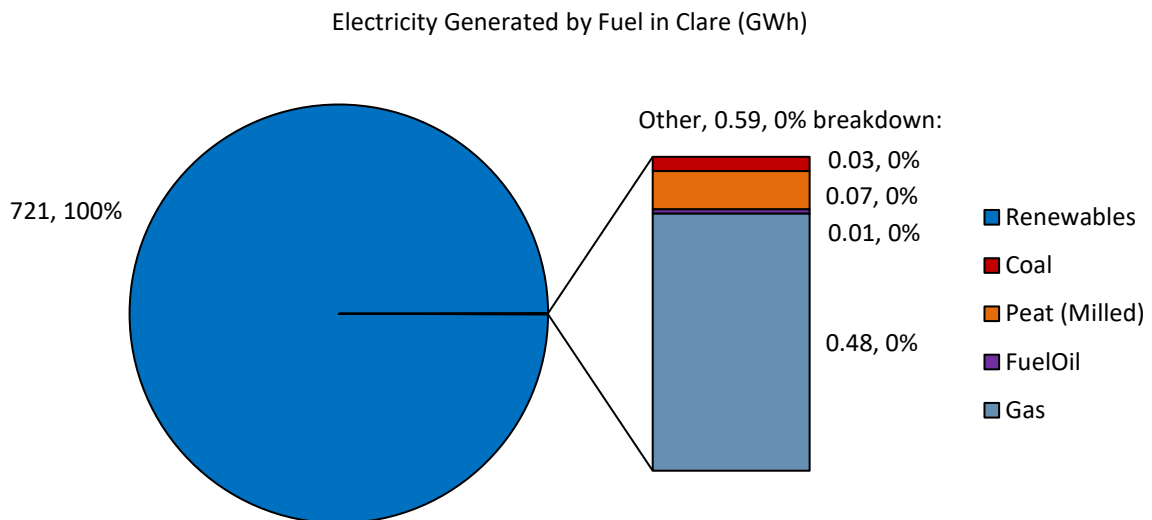
⁵ Clare Energy and Emissions Balance, Update 2021

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.

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

4.3 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 – Unconstrained⁶

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

⁶ Renewable Energy Resource Assessment of Clare and Limerick, 2010, LCEA

10	Micro Gen elec	48.6	14.9
8, 10	CHP electric	584.5	35.0
Sub Total		44,242.6 -120,649.9	24,104.3 23,792.7
13	Transport	1,404.0	200.3
Overall Resource		48,846.6 125,253.9	25,327.2 25,015.5

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 plan-led 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
			88,011.7	12,327.3
13	Transport		204.0	29.1
Overall Resource Target			14,300.5	12,970.9
			89,735.0	12,858.2

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 ~~presented~~ established in this ~~strategy~~ RES should not be interpreted as a ceiling. ~~In~~ 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 ~~above figures~~ 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 onshore 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 onshore 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	64.2 128.3	14.7 29.3
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<i>(Of which Community and Citizen owned elements)</i>		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 ~~as to who would have the remit over wind farms off shore and the energy generated from them~~. Also, it is likely any offshore 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.

Chapter 9 Marine Renewables

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. 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 Estuary⁷. 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 seabed (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.

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.

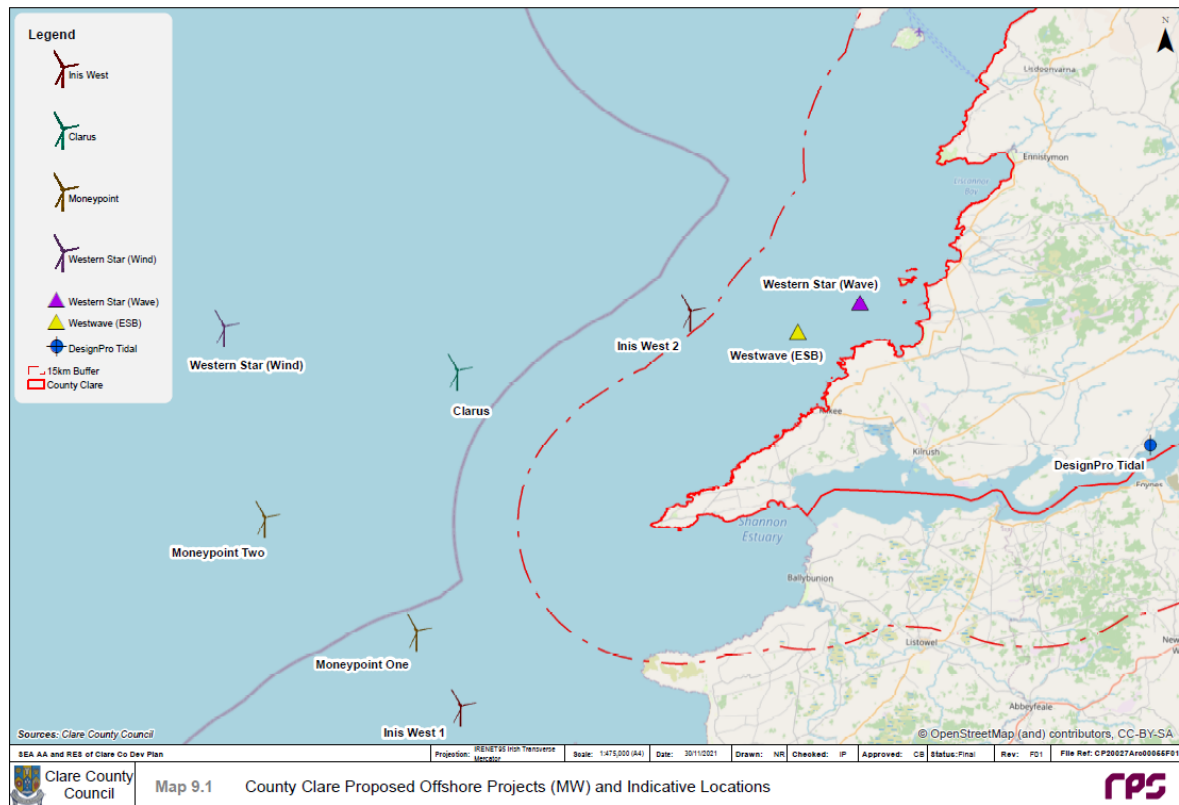
Details of the offshore renewable energy projects off the coast of Clare are included in Table 9.1 and identified on Map 9.1.

⁷ Shannon-Foynes Port Company Strategic Review, section 4.1, p42, SPFC (2022)

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

Map 9-1 County Clare Proposed Offshore Projects (MW) and Indicative Locations



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 (OREDPP). 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 OREDPP Interim Report also identifies the Shannon Estuary as a potential location for tidal energy and wave energy. While the OREDPP is primarily focused on delivering the State's 2030 generation ambitions through fixed-bottom wind turbines, the Offshore Renewable Energy Development Plan II (OREDPP 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.⁸ 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.

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

⁸ 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, ~~including a~~ A Synchronous Compensator ~~with the largest flywheel of its kind in the world was completed in 2022, which~~. It will provide a range of electrical services, ~~enabling 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.



COMHAIRLE | CLARE
CONTAE AN CHLÁIR | COUNTY COUNCIL

Áras Contae an Chláir
New Road, Ennis
County Clare V95 DXP2
www.clarecoco.ie