

[REDACTED]

Clare County Council
Áras and Chontae
New Road
Ennis

delivered by hand and by email
2nd March 2022

Re: Draft County Development Plan 2023-2029

A Chara,

Thank you for the opportunity to comment on the Draft CDP 2023-2029. My comments are directed at the renewable energy and greenhouse gas emission aspects.

The Renewable Energy Strategy of the draft CDP contains serious deficiencies, with exaggerated claims based on significant analysis errors and omissions. I strongly recommend that the council bring these substantive matters to the attention of its external consultants and internal teams before the CDP is finalised. Incorporating the current draft Renewable Energy Strategy without fundamental changes would undermine the credibility of the entire CDP.

I summarise my main points below, which are discussed in detail later. A table outlining my own analysis of credible renewable energy and GHG reduction aspects is appended at the end of this document. It is based on fuel data from the draft CDP and assumes alignment with the Climate Action Plan 2021 (CAP 2021). The supporting spreadsheet has been sent to the council, which may be of assistance to your energy analysts in following my line of reasoning.

Summary of Comments and Recommendations

1. Urgent Need to Meet Existing Wind Power Targets

Identify barriers to achieving existing target of 550MW installed wind capacity and develop comprehensive pre-planning guidance as appropriate to assist developers

2. Need for Expansion of Onshore Wind Power

Accelerate work on identification of additional onshore wind power to bring Clare up to around 900MW, in alignment with CAP 2021, to enable immediate implementation when the revised wind energy guidelines are published

3. Misleading Claims on Renewable Electricity Consumption in Clare

References in the draft CDP to Clare already having almost 100% renewable electricity are erroneous, profoundly misleading, and seriously undermine the energy analysis.

4. Renewable Energy Target for 2030

The 100% renewable energy goal for 2030 appears to be technically unachievable, and would inevitably be missed. Revise downwards to a more credible achievable level

5. Unrealistically High Biomass projection

Very high biomass projections risk target being missed. Revise projected biomass resource downwards to a more credible level that can be achieved

6. Renewable Transport

The target for renewable transport is very low, and less even than the contribution from the existing biofuel obligation scheme

7. Micro-Thermal

Clarify what is meant by “micro-thermal” – is it heat-pumps plus small scale biomass, and in what proportion?

8. Estimates of Renewable Energy in Clare

Revise analysis to show clearly what the percentage of renewable energy is currently used in Clare, and realistically projected at the end of the plan

9. Alignment With CAP 2021 and National GHG Reduction Target for 2030

Revise analysis and presentation to show how the plan will align with National Climate Action Plan 2021 (CAP 2021) and the national GHG reduction target of 51%

10. Strategic Environmental Assessment (SEA)

Include GHG impact of CDP 6.27 (Data Centre) in Strategic Environmental Assessment. Its omission leaves the SEA wide open to challenge

Any documentation of this scale will inevitably have errors in data compilation, which would hopefully be identified and rectified in final proofing. However, as some of these errors affect the following discussion, I draw your attention to them, to avoid any confusion.

Firstly, there is a significant error in the yield from solar PV in the tables. It appears to be overestimated by a factor of ten, presumably due to omission of a capacity factor in the calculation. Consequently, the totals in the energy tables in Volume 5 are also incorrect. It appears also that in some of the tables electrical and transport energy consumption have been switched. I have incorporated what I believe to be the correct figures in my analysis.

1. Urgent Need to Meet Existing Wind Power Targets

An immediate objective should be incorporated into the plan to actively push for completion of the existing target of 550MW installed wind capacity. There is currently 153MW installed, with permission for a total of 347MW, leaving the permitted capacity approximately 200MW short of the original target. High refusal rates for wind energy projects in recent years undermine investor confidence. Reasons for failure of recent planning applications should be investigated and comprehensive pre-planning guidance provided for developers to reduce investment uncertainty.

2. Need for Expansion of Onshore Wind Power

As clearly identified in the draft plan, the main mode of delivering significant renewable electricity in the time-frame to 2029 is through onshore wind energy, as the large off-shore resources will not yield significant output until the 2030s. The current situation as explained in the draft plan is that Planning Circular PL 20-13 of 2013 has effectively put a hold on revision of the Clare Wind Energy Strategy, pending publication of new wind energy guidelines. This is a regrettable situation as we are still operating to a plan devised in 2011.

In the interim there has been a substantial upward revision of the scale of action needed to avert catastrophic climate change. In 2011, the council would have factored in the need to achieve a reduction of 20% in GHG by 2020. It is now acknowledged that reduction targets must be accelerated, and Climate Action Plan 2021 (CAP 2021) has a target of 51% GHG reduction by 2030, with 80% renewable electricity. County Clare which is one of the western counties with highest wind energy resources has a duty to meet its existing targets, and to step up its contribution to the new national targets.

While the council may be precluded from issuing a revised wind energy strategy at present, the likely new guidelines are well known and there is no reason why preparatory studies cannot be undertaken, and draft extended zonings established, so that a revised wind energy strategy can be immediately adopted as a variation of the CDP, as soon as new wind energy guidelines are available. CAP 2021 envisages an increase in onshore wind energy in excess of 60% to 8000 GW installed capacity. Scaling Clare's contribution up accordingly would bring it close to a 900 MW

target for the county. This would be consistent with the “technical and practical” onshore wind energy capacity of 952MW identified in Volume 5, Table 4.2.

3. Misleading Claims on Renewable Electricity Consumption in Clare

Reference in the draft CDP to Clare’s electricity consumption being numerically almost equal to renewable electricity generation in the county, provides a readily understandable measure of the scale of renewable electricity generation within the county. However, expansion on this aspect in the text is simplistic and displays little understanding of operation of the national grid, or the role of the wind-rich western counties in achieving national targets. Furthermore, it creates a profoundly misleading impression that Clare has essentially achieved its renewable electricity target, which is clearly not the case, and undermines the credibility of the renewable energy analysis and projections in the draft CDP.

There is a single electricity market operating on the island of Ireland. The renewable electricity component on the grid is calculated on an all-island or on a national basis by the ratio of the renewable component to the total electricity supply, averaged over a year. Currently this stands at around 40%, which represents a great success.

It is meaningless to assign renewable electricity generation within a particular county to consumption in that county, as all generation feeds into and is supported by the national grid. It would similarly be naive to assign responsibility for fossil fuel electricity to the county where the generating stations happen to be located. If this were done the continued operation of Moneypoint coal-fired station would bring the proportion of renewable electricity in Clare down to close to 3%, which would be a silly claim.

In making this claim of almost 100% renewable electricity in Volume 5, it appears that the output of Ardnacrusha plus the existing windfarms is assigned totally to the county. Claiming the output of Ardnacrusha for Clare is obviously without basis, as this hydroelectric plant was built over eighty years ago to serve the needs of the entire state.

Even if one speculates that the renewable wind energy generated in county Clare is consumed entirely at distribution level within the county, it does not follow that the average electrical energy consumption is all renewable. It is well known that that wind energy is variable, and to match demand, there is a requirement for back-up fossil fuel power plants during lulls in the wind, and a requirement to export excess wind energy during high wind.

I have carried out an approximate analysis of the actual contribution of wind energy in Clare based on hourly wind data for 2020, and with the installed capacity of 153 MW. It turns out that the annual wind energy generated would be approximately 56% of the county demand, but due to mismatch between hourly supply and demand, on average only 43% of the consumed electricity would be renewable. Back-up of 57% fossil fuel generation would be required.

In conclusion, no county can justify doing a solo-run and plan its renewable electricity strategy in isolation, as all counties are connected to the same electricity grid. Claiming all renewable generation in the county would also result in double counting, as the renewable generation is also included in the national totals. The only rational approach in the CDP would be to use the national figure of 40% renewables for 2022 (or whatever the exact figure is from Eirgrid), and the projected national value of 80% for 2030.

This error of assigning all generated renewables to Clare's renewable energy totals is embedded throughout Volume 5, and creates the false impression that Clare's renewable energy will exceed consumption in 2030. In the renewable energy tables in Volume 5, the output of wind farms and Ardnacrusha should not be added to the county total energy consumption. It should be reported under a separate heading, as a contribution to the national grid. For the year 2030, it would however be valid to add 80% of the projected electricity consumption to the county renewables total.

I list below sections of Volume 5 where I have noted the misleading renewable electricity claims. I urge the council to undertake a complete review of Volume 5, and to remove all such misleading claims.

Executive Summary, Table on P.9

"Wind Energy (onshore) : Strong progress (153MW installed), enabling Clare to supply enough electricity to meet its own initial needs"

Not true: only 153 MW of the original 550MW target installed – hardly strong progress, and Clare not entitled to claim all wind energy in the county to supply its own needs, and in any event physically impossible given need for fossil generator back-up.

P. 38

"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."

This again refers to erroneous allocation of all wind and hydro power to Clare, and implies that only 1 GWh remains to achieve target, which is untrue. Clare's permitted wind power capacity is currently more than 500 GWh short of the target.

P.39

"As seen in Figure 3.4, the majority of electricity generation in Clare came from renewable sources in Clare (wind)."

Untrue.

P. 46

“In relation to off-shore wind it is currently unclear as to who would have the remit over wind farms off-shore and the energy generated from them.”

Again, this is the flawed reasoning which implies county ownership of a national wind energy resource. It is quite clear that the national grid will have “the remit” for output from all off-shore wind farms, and the power output cannot be arrogated by any particular county. Likewise for example the Celtic Interconnector to France which will come ashore in Co. Cork obviously cannot be claimed as a low-carbon alternative electricity supply for Cork only.

The Strategic Environmental Assessment P. 198 repeats the false renewables claim, and expands to claim net zero CO₂, which is patently untrue:

“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.”

4. Renewable Energy Target for 2030

In Volume 5, section 3.4 the renewable energy objective is stated to be:

*“It is an objective of Clare County Council:
To meet the County’s energy needs from 100 % indigenous renewable energy sources.”*

In Section 4.8 the Objective is repeated with reference to projections in Table 4.3:

*“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,……. ”*

Having carefully analysed the underlying data I believe that a 100% renewable energy target is not technically or practically achievable by 2030. In setting such a target it is inevitable that it will be missed, which would greatly undermine confidence in the CDP. As mentioned earlier, the energy analysis incorporates a major error in assigning all of the renewable generation in the county to Clare. Excluding renewable electricity generation in the county from Table 4.3, the total renewable energy in 2030 would be 1057 GWh. The projected electricity consumption in Clare in 2030 is 914 GWh¹ (Table 3.1), and 80% of this is expected to be renewable, i.e. 731 GWh. Adding this renewable electricity component gives a total renewable energy of 1788

¹ In Table 3.1 Transport was given as 914 GW, and Electricity 1299 GWH for 2030, but I believe it should be Electricity 914 GWh, Transport 1299 GWh, which is consistent with other data in the report

GWh. Energy consumption in 2030 is projected to be 3253 GWh (Table 3.1). Renewable energy would therefore be $1788/3253 = 55\%$.

Reaching a renewable energy contribution of 55% would be a tremendous achievement. However, the assumptions behind the data in Table 4.3 are questionable. There is a very high projection of biomass renewables, and while these energy sources can be directed towards thermal loads, or to renewable electricity, they are not usable by the transport sector. The recalcitrant sector will be transport which even with the expected transition to e-vehicles, will still be heavily reliant on fossil fuels in 2030.

5. Unrealistically High Biomass projection

The sum of the biomass targets in Table 1.1/Table 4.3 is 784GWh (excluding wastes and micro-thermal). CSO data for 2020 reports a national biomass primary energy supply of 270 ktoe (3151 GWh), which was 2% of total primary energy supply. The projection of 784 GWh for Clare would be 25% of existing national primary supply. I have not been able to source data on existing biomass energy supply in Clare, but on a pro-rata basis to national supply it might be around 60 GWh. While there is undoubtedly scope for expanding supply in Clare it would have to be considered highly improbable that an increase to 784GWh can be achieved.

Apart from the limitation of raw material supply, as a technology biomass will be much more difficult to scale up than for example electrical options. For de-carbonising high heat loads in industry, electrical options would be much simpler. For commercial and residential heating, existing heat-pump options are more attractive, and will be largely renewable energy if we reach our national target of 80% renewable electricity in 2030. Biomass CHP would however be a workable option if it can be located near high heat industrial or commercial building loads. However, the absence of any district heating infrastructure in the county would limit potential. Overall, it would be best to revise down biomass projections to what might reasonably be achieved.

6. Renewable Transport

The renewable Transport target of 14GWhr in 2030 in Table 4.3 is extremely low, and may be an error. If the target e-car numbers of 26600 are reached (section 13.2) I calculate it would reduce fossil fuel consumption by 183 GWh. Because e-cars are at least three times more efficient than internal combustion engines, the required electrical powering would be typically around 61 GWh, and 80% of this would be renewable in 2030, i.e. 48 GWh. In addition, there will be almost 15% biofuel mix in 2030, which would constitute an additional renewables component of 143 GWh. The overall renewable Transport energy in 2030 could therefore reach $49 + 143 = 192$ GWh (see my calculations in table attached , spreadsheet also available).

7. Micro-Thermal

In the projected renewable thermal energy for 2030 in Volume 5 a significant contribution of 175.7 GWh is factored in for micro-thermal. It represents 34% of the thermal subtotal. I presume that this refers to heat-pumps and small biomass boilers/stoves, but might also cover solar thermal systems. From my own analysis I believe that a renewable energy contribution of this magnitude may be achievable (see Energy Analysis table attached). As it is likely to be a major element in decarbonising heating it would be helpful if this were clarified in the CDP.

8. Estimates of Renewable Energy in Clare

In any plan we can only start from where we are. In the draft CDP it is not at all clear where we are in terms of energy performance at present, or what percentage renewable energy can be achieved in 2030. The erroneous inclusion of all wind and hydro generation in the county total has resulted in a grossly inflated estimate of current and future renewable energy.

In my own analysis (see table attached), I calculate that Clare currently has perhaps 14% renewable energy consumption, which is consistent with the national figure of 12% renewables (SEAI, Energy in Ireland 2020). In reality we are at around the national average. The energy analysis underlying the report should be fundamentally revised to reflect the actual existing situation, which is the only firm basis for rational planning. This revision should also estimate the expected renewable energy consumption in 2030. According to my analysis, Clare could potentially achieve up to 35% renewable energy consumption in 2030. Reaching this level of renewables would however be extremely challenging, and would only be achieved if all elements of National Climate Action Plan 2021 meet their targets.

9. Alignment With CAP 2021 and National GHG Reduction Target for 2030

The CDP should seek to align as closely as possible with the national strategy, which is set out in Climate Action Plan 2021. Achieving increased renewable energy and reduction in GHG emissions in the county will be heavily reliant on the support measures incorporated in the national plan. While the energy projections in Volume 5 for 2030 include many of the technologies mentioned in the national plan, it is unclear to what extent the CDP is quantitatively aligned with the national strategy. The prime objective of CAP 2021 is to achieve a reduction of 51% in GHG emissions by 2030 (re 2018). While Volume 5 documents in great detail the history of climate action legislation and measures in the EU and Ireland, there is no treatment of GHG emissions in County Clare, which could readily be calculated from the fuel data.

Goal I of the draft CDP envisages:

“A county that is resilient to climate change, plans for and adapts to climate change and flood risk, is the national leader in renewable energy generation, facilitates a low carbon future, supports energy efficiency and conservation and enables the decarbonisation

of our lifestyles and economy.”

Many of the objectives in the draft plan support this low carbon development goal. However, in the detailed analysis presented in Volume 5, there is no estimation of county GHG emissions, no specific emission reduction targets and no quantitative assessment of the feasibility of achieving the low carbon goal. This aspect should be revisited and estimates should be made of existing GHG emissions and projected emissions in 2030. It is important that the council and public are aware of the existing situation and the scale of the challenges which will be faced.

From my own approximate analysis I believe that existing energy-related GHG emissions are just over 900,000 tonnes CO₂ per year. If the county aligns very closely with the measures in CAP 2021, it could theoretically reduce these emissions to just over 500,000 tonnes in 2030, which would be a reduction of 44%. This assumes that there are 26600 e-cars by 2030, a 20% reduction in road transport, thermal upgrade of 13000 households to BER B2, with 10000 households converting to heat-pumps, and a further 4000 households replacing fossil fuel heating with biomass solutions. Achieving the 44% reduction would also require that the national grid electricity is 80% renewable, and County Clare will need to step up its ambitions to contribute meaningfully to this target. The scale of the challenge is immense and should be clearly communicated in the CDP.

10. Strategic Environmental Assessment (SEA)

The objective of facilitating a Data Centre is set out in CDP6.27

“It is an objective of Clare County Council:

To facilitate and support the development of a data centre on the Enterprise zoned lands (ENT 3) at Toureen Ennis subject to normal planning considerations and the implementation of the findings of the SEA and AA associated with this Plan”

The powering of the data centre will result in the emission of very large quantities of carbon dioxide. I have searched through SEA Volumes 10(i), 10(ii) and Appendices, and can find no details, analysis or assessment of GHG emissions associated with potential data centres in the county.

In Appendix page 81 there is a note as follows regarding CDP 6.27:

“SEA Recommendation as outlined at Pre-Draft stage not included as the mitigation associated with this site is included in Appendix D of this SEA.”

Further down in Appendix D a set of mitigation measures is given for “Transformational Site 9 – Data Centre” (page 661 of the pdf). These measures deal with construction phase and hydrological aspects. However, none of these measures address GHG emissions.

A previous SEA (11th March 2019) was conducted specifically for variation no. 1 of the CDP 2017-2023 to include data centre zoning. On page 108 of the SEA, the following was stated with respect to mitigation:

“Climate Change

In the absence of mitigation, the proposed variation consisting of the proposed ENT3 lands for Enterprise use has the potential to increase greenhouse gas emissions. However, with effective implementation of construction management plans for each phase of potential development, the proposed construction-related greenhouse gas emissions are expected to be negligible.”

From the above it is clear that only emissions related to the construction phase were considered.

It is hard to believe, but it appears that consideration of the environmental effect of CDP 6.27 in terms of operational phase GHG emissions and consequent impact on the environment has been completely omitted from the SEA analysis for draft CDP 2023-2029, and also from the earlier SEA for Variation no.1. to the CDP 2017-2023.

Given the great detail presented for other environmental aspects in the SEA, and that the increased greenhouse gas emissions associated with CDP 6.27 are likely to be the most significant impact, this surprising omission greatly undermines the credibility of the SEA and raises serious questions.

Overall, Clare Renewable Energy Strategy Volume 5 and SEA Volume 10 of the draft CDP exhibit substantive deficiencies. In particular the exaggerated claims of renewable energy in Volume 5 are clearly erroneous and entirely misleading, and the inexplicable exclusion of the GHG impact of CDP 6.27 in SEA Volume 10 is a grave omission.

Giving the evident effort and apparent attention to minute details that has gone into preparing the draft plan, I find it hard to understand how these regrettable deficiencies have occurred. The council relies heavily on professional advice in compiling these plans and it would be advised to bring these serious matters to the attention of its external consultants and internal teams to determine the appropriate course of action.

Yours sincerely,

Dr. Colin Doyle

Energy Analysis Table (based on fuel data in draft CDP and assuming alignment with CAP 2021)

Energy Analysis	2020						Renewable Energy Measures										2030				
	Fuel GWh	Fuel	% renewable	Renewable GWh	EF tCO2eq/GWh	Emissions CO2eq kt	%Thermal Upgrades	% Thermal Upgrade Saving	Thermal Upgrade Saving GWh	%Transport Reduction	Transport Reduction GWh	% change to electric	Change to Electric GWh	Extra Electric Load GWh	% change to biomass	Extra Biomass GWh	Fuel GWh	% Renewable	Renewable GWh	EF tCO2eq/GWh	Emissions CO2eq kt
Thermal	639	Oil	0%	0	264	169	29%	30%	56			24%	140	47	10%	44	399	0%	0	264	105
	613	Gas	0%	0	205	125	29%	30%	53			24%	134	45	10%	43	383	3%	11	205	76
	78	Coal	0%	0	341	27	29%	30%	7			24%	17	6	10%	5	49	0%	0	341	17
	47	Peat	0%	0	374	18	29%	30%	4			24%	10	3	10%	3	29	0%	0	374	11
	56	biomass	100%	56	20	1											152	100%	152	20	0
Electricity	722	Electricity	40%	289	324	234				20							883	80%	707	100	88
Transport	1427	Petrol diesel	12%	143	264	339				20%	285	16%	183	61			959	15%	143	264	215
Totals	3582			488		912			120				484	161		96	2854		1013		512
Renewable Energy 2020				14%											Renewable Energy 2030				35%		
GHG Emissions 2020					912 ktCO2eq										GHG Emissions 2030				512 ktCO2eq		
															GHG Reduction				-44% re 2020		

Notes on Spreadsheet Table

Fuel data: from draft CDP. For oil draft CDP gives total as 2166 in 2020, subtracting 1427 for transport gives 639 oil for thermal applications. Fuel in 2030 is calculated based on shift to renewables

Transport: 12.359% biofuel 2020, 14.952% 2030, 20% reduction due to modal shift, 16% reduction in fossil fuel due to electrification. As per CDP 26600 e-cars in 2030 in Clare, which at 14,000km/yr, and 60KWh/100km (6litres/100km) amounts to 223 GWh, which is 16% of 2020 fuel usage

Emission Factors (EF): SEAI data, EF of 324 t/GWh for electricity in 2020 includes allowance for 40% renewable, and EF of 100 for 2030 is calculated based on 80% renewable electricity. Biomass - nominal small EF of 20 to account for processing/distribution, as per representative default values in REDII

Thermal Upgrades

Average of 29% household upgrades as per CAP 2021, assume commercial/industry % upgrades similar
% Energy Savings from Thermal upgrades: Average BER in Clare is D1, and upgrade to B2 should reduce energy consumption by 55% according to BER calculations. But in practice much less achieved: assume 30% improvement
(in poorly insulated draughty houses people only heat occupied rooms for limited times, so energy consumption prior to upgrade will be overestimated by BER)

Thermal – Conversion to Electric Heat Pumps

CAP 2021 target of 400,000 heat pump upgrades to existing houses, which is 24% of the housing stock

Extra Electric Load

Heat pump delivers >3 units of heat energy per unit of electrical energy, e-cars > 3 times more efficient than petrol/diesel cars, so extra electrical energy is one third of the displaced fossil fuel energy

Change to Biomass: unlikely that more than 10% would switch heating to biomass, and resources probably not sufficient for a higher % switch