WIND ENERGY IRELAND

Call for Expert Evidence
Climate Action Plan 2021

18/05/2021

windenergyireland.ie

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1 Executive Summary

Wind Energy Ireland would like to thank the Department of the Environment, Climate and Communications for the opportunity to provide a submission on the *Call for Expert Evidence - Climate Action Plan 2021.*

Wind Energy Ireland is the nation's largest renewable energy organisation with more than 150 members who have come together to plan, build, operate and support the development of Ireland's onshore and offshore wind generation.

We work to promote wind energy as an essential, economical and environmentally friendly part of the country's low-carbon energy future.

As a leader in Ireland's fight against climate change, wind energy creates jobs, invests in communities and reduces CO2 emissions.

In 2019 alone, according to the most recent report from the Sustainable Energy Authority of Ireland, wind energy avoided 3.9 million tonnes of CO_2 and cut our fossil fuel import bill by €248 million.

Ireland is already number one in the world for the share of electricity demand met by onshore wind and in 2020, wind energy provided over 38% of the country's electricity supply.

Wind energy is also a major contributor to Ireland's economy. The recent *Economic Impact of Onshore Wind in Ireland*[1] report from KPMG showed that onshore wind energy is supporting more than five thousand jobs and is worth over €400 million annually to our economy. We know these figures will rise in the years to come and this will be accelerated by the development of offshore wind energy.

The 2019 Climate Action Plan and the Programme for Government (PfG) set out ambitious goals of developing 5 GW of offshore wind and doubling our onshore wind capacity to 8.2 GW by 2030.

They are ambitious, but they are absolutely achievable.

Our members already have a very strong pipeline of onshore and offshore projects. Over the coming decade we will develop the new wind farms on land and at sea that will deliver the targets set in the 2019 Climate Action Plan and Programme for Government.

While we warmly welcomed the 2019 Climate Action Plan we also believed that a greater level of detail was needed in identifying the changes in law, policy and practice which are required to deliver the 70 per cent renewable electricity target enshrined in that plan.

[1] Economic impact of onshore wind in Ireland - https://windenergyireland.com/images/files/economic-impact-of-onshore-wind-in-ireland.pdf

That is why, throughout 2020, Wind Energy Ireland developed a four-part series of reports, the 70by30 Implementation Plan, setting out the policy changes required to:

- deliver 5 GW of **offshore wind** by 2030,
- deliver 8.2 GW of **onshore wind** by 2030,
- **minimise renewable dispatch down** via minimising curtailment and constraints,
- **and reduce the cost of developing renewable generation in Ireland by almost 50%**.

This research drew on the advice of expert independent consultants and the accumulated experience of literally dozens of experts involved in the development of renewable energy in Ireland and in other countries.

It remains the single most comprehensive analysis done to date on how to reach the 70 per cent target by 2030 and we would be happy to meet with the relevant parties to discuss the content of these reports in more detail.[2]

As part of Wind Energy Ireland's work to prepare a response to the Climate Action Plan Call for Evidence, we commissioned Baringa Partners to analyse a pathway to deliver a zero-carbon power system for Ireland utilising the PfG and 2019 Climate Action Plan capacity targets for onshore and offshore wind energy.

The full analysis of Baringa's 'Pathway to a zero-carbon power system in Ireland' study is submitted as an accompanying appendix to this response.

The analysis shows that the emissions footprint of the electricity sector in Ireland can be reduced substantially beyond the 4 - 5 Mt of CO_2 objective of the Climate Action Plan 2019 by 2030.

It concludes that:

1. Government should **maintain the Climate Action Plan 2019 and Programme for Government renewable capacity targets** for onshore wind (8.2 GW) and offshore wind (5GW) for 2030, along with 5 GW of solar PV.

2. The Climate Action Plan 2021 should set a 2030 **power sector emissions target of less than 2 million tonnes of CO_2** which:
   - Is very achievable by 2030;
   - Does not require a significant change in the approach currently underway to achieve 70% renewable electricity;
   - Can be met by implementing more of existing technologies that are proven today; and
   - Can be achieved at a lower cost to the end consumer (saving approx. €150m per annum).

[2] https://windenergyireland.com/images/files/70by30-implementation-plan-reports.pdf

3. A **stretch target of a zero-carbon power system by 2030 is possible though**:
    - It requires incremental investments in a suite of new technologies; and
    - It requires the introduction of a carbon price floor in I-SEM.

Wind Energy Ireland strongly endorses these positions and recommends that the Government considers adopting these recommendations as actions in the Climate Action Plan 2021.

Grid development

If there is one key message we believe must be understood by the authors of the new Climate Action Plan it is that the single most significant challenge to achieving whatever ambitions the plan might contain for 2030, and beyond, is the need to develop our electricity grid.

The most significant challenge Ireland faces in achieving these goals is whether the grid will be strong enough to integrate this volume of renewable energy. Last year more than 10% of renewable generation was lost because the grid could not accommodate it. There was enough renewable energy lost last year to power all of Galway City, Limerick City and Sligo town for a year.

We cannot decarbonise Ireland without first decarbonising our electricity system. One cannot happen without the other. And we cannot cut the CO_2 emissions in our electricity system without a much stronger grid.

We need a complete redesign and reinforcement of the transmission system to deliver the renewable capacities outlined in the PfG, with a focus on parts of the country where large volumes of renewable energy will be developed.

Our fossil fuel back-up generation must be replaced with zero-carbon solutions like energy storage and demand response that will enable an electricity system capable of operating with 100% of demand being met by renewables at any one time.

An electricity grid and market designed for fossil fuel generators are not suitable for a future where most of our electricity comes from wind and solar. Full decarbonisation of the electricity sector is possible within the 2030 timeframe, but we must reform the market to ensure the new system we are building is efficient and cost effective and that investments are supported over the long-term in renewable generation and other technologies such as green hydrogen, long-duration storage and interconnection that will be needed in a zero-carbon world.

In March, the MaREI Institute, in collaboration with Wind Energy Ireland, published 'Our Climate Neutral Future: Zeroby50' which put forward a pathway to deliver a zero-carbon economy for Ireland. It explains how substantial electrification of heat and transport and build out of renewables will be required over the coming decades, and shows that Ireland's electricity demand could grow by 3-4 times from 29 TWh today to 84-122 TWh by 2050. Most of this demand will be met by wind energy and we will need approximately 25 GW of installed renewable capacity. This study is submitted as an accompanying appendix to this response

But none of this will be accomplished, none of it is remotely achievable, without a reinforced and strengthened electricity transmission system.

Developing the electricity grid will not be easy. We must work with communities who will be hosting new wind farms or new grid infrastructure. We must ensure they are empowered to be part of our energy transition and we must find ways to adapt, where we can, to meet their concerns.

We must accept we do not have all the answers and listen to those who know their land and their community the best – the people who live there – and to the solutions they bring forward.

We must also try to maximise the use of the existing electricity grid, which will help to reduce the need for new infrastructure.

But no matter how much we improve how we operate, maintain and use the existing infrastructure, we must also face reality.

The reality is we will not decarbonise our economy without new overhead lines, underground cables, substations, battery projects, wind farms and solar farms.

We have selected a number of sections and questions from the Climate Action Plan 2021 Call for Evidence that are most relevant to the wind energy industry and we have put forward a number of policy improvements that we believe are essential to dramatically reduce CO_2 emissions in the electricity sector over the coming years.

We recommend that these policy improvements should be incorporated into the Climate Action Plan 2021 to put us on a path to fully decarbonising the electricity sector as soon as possible.

If implemented, we can built a net-zero society in Ireland by 2050, one that is energy dependent, with warmer homes, cleaner air and tens of thousands of new jobs generated by a truly just transition.

2 Introduction

Wind Energy Ireland (WEI) have selected a number of sections and questions from the Climate Action Plan (CAP) 2021 Call for Evidence that are most relevant to the wind energy industry for our response.

These sections are:

- Electricity
- Carbon Pricing and Cross-Cutting Issues
- Just Transition

Under each question we have put forward a number of policy improvements that we believe are essential to dramatically reduce CO_2 emissions in the electricity sector over the coming years and that we are proposing be included in the final CAP 2021.

Please find our responses to these questions in the following sections.

3 Electricity

3.1 WEI Response to Question 1: What options are available to increase the penetration of renewable electricity beyond the 70% committed to in Climate Action Plan 2019?

3.1.1 Pathway to a Zero-Carbon Power System

The Climate Action Plan 2019 set a goal to reduce emissions in the electricity sector from 12 Mt (based on 2017 figures) to 4-5 Mt by 2030.

Building on this, the Programme for Government (PfG) has set a commitment to reduce carbon emissions by 7% per year over the next decade in Ireland across all sectors, which corresponds to more than a 50% absolute reduction in that timeframe. Government targets have been set for the capacity of various renewable energy technologies by 2030 to help deliver on these emissions targets - this includes capacity targets of 8.2 GW of onshore wind and 5 GW of offshore wind. Our members are responding and actively developing pipelines of projects which are sufficient to meet these targets.

As part of WEI's evidence to Climate Action Plan Call for Evidence, WEI commissioned Baringa Partners to analyse a pathway to deliver a zero-carbon power system for Ireland utilising the PfG and 2019 Climate Action Plan capacity targets for onshore and offshore wind energy. The full analysis of Baringa's 'Pathway to a zero-carbon power system in Ireland' study is submitted as an accompanying appendix to this response.

This analysis was carried out using the same methodology which was applied in the 70by30 report[3]. The appropriate input assumptions have been updated to take account of the PfG and latest electricity demand projections.

The analysis shows that the emissions footprint of the electricity sector in Ireland can be reduced substantially beyond the 4 - 5 Mt of CO_2 objective of the Climate Action Plan 2019 by 2030.

It concludes that:

1. Government should **maintain the Climate Action Plan 2019 and Programme for Government renewable capacity targets** for onshore wind (8.2 GW) and offshore wind (5GW) for 2030, along with 5 GW of solar PV.

2. The Climate Action Plan 2021 should set a 2030 **power sector emissions target of less than 2 million tonnes of CO_2** which:
    - Is very achievable by 2030;

[3] Baringa - 70 by 30 Report - https://windenergyireland.com/images/Article_files/Final_Baringa_70by30_Report_web.pdf

- Does not require a significant change in the approach currently underway to achieve 70% renewable electricity;
- Can be met by implementing more of existing technologies that are proven today; and
- Can be achieved at a lower cost to the end consumer (saving approx. €150m per annum).

3. A **stretch target of a zero-carbon power system by 2030 is possible though**:
    - It requires incremental investments in a suite of new technologies; and
    - It requires the introduction of a carbon price floor in I-SEM.

Wind Energy Ireland strongly endorses these positions and recommends that the Government considers adopting these recommendations as actions in the Climate Action Plan 2021.

The results show that achieving less than 2 million tonnes of CO2 in the electricity sector will not require a significant change in the approach currently underway for 70by30. It is primarily "more of the same". Industry is developing a sufficient pipeline, the interconnection required is in development and the DS3+ programme is already planned (although the objectives of the DS3 programme needs to be updated to include the complete removal of system operational constraints i.e., EirGrid's 95% SNSP target needs to increase to 100% SNSP and the system should be capable of operating with no minimum conventional generation requirements). The most significant change is that EirGrid will need to accommodate more grid development than the 40-50 project limit suggested in the recent Shaping our Electricity Future consultation.

We believe the key target for the power sector for 2030 should be to reduce CO_2 emissions to less than 2 million tonnes by 2030 rather than focusing on a specific RES-E target. This is a necessary step on the path to a zero-carbon economy and by progressing the actions we will outline in the following sections, in parallel with the renewable capacities in the PfG, Ireland can achieve substantial emissions savings in the electricity sector at a net benefit to consumers by 2030.

Baringa have also carried out analysis on our capacity to go further and completely decarbonise the Irish electricity sector. This will require additional measures such as carbon pricing, long-duration storage and green hydrogen and full build out of the renewable capacities in the PfG and can be targeted as a second phase for decarbonisation of the electricity sector.

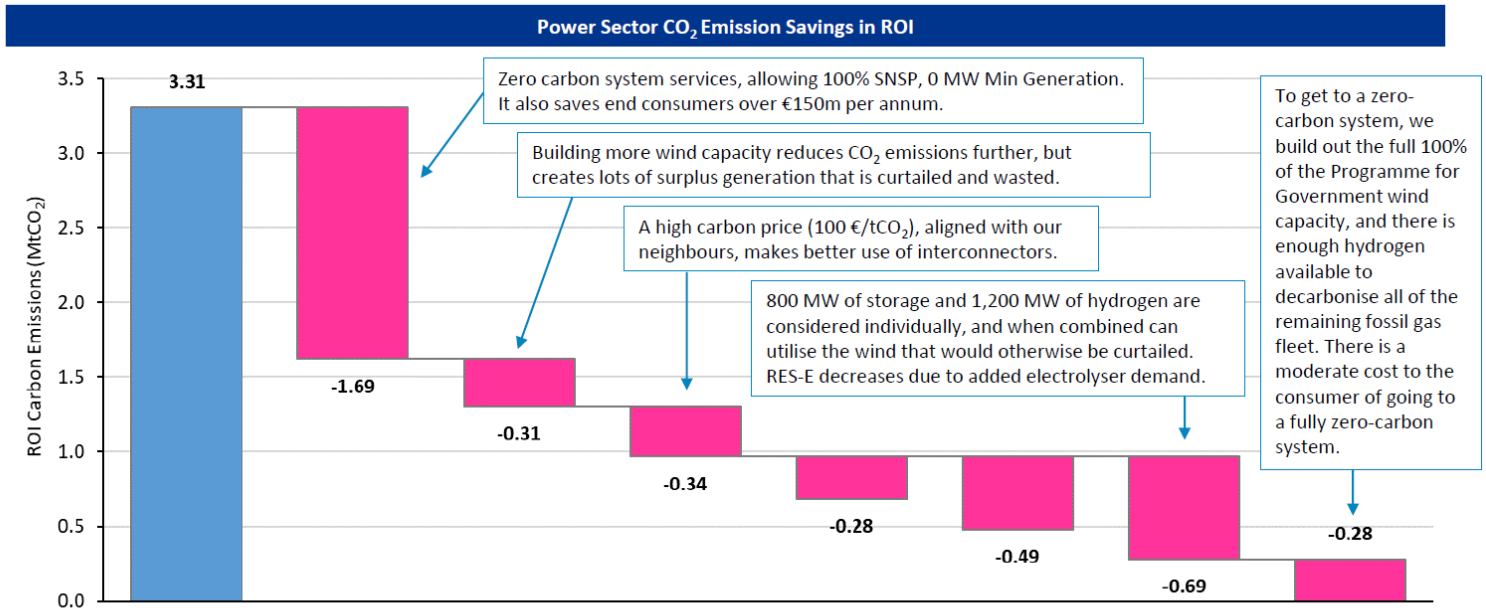
A summary of the findings of the analysis that shows the steps in reducing emissions beyond the 70by30 base case is shown in Figure 1 below. A full summary slide deck of the analysis is provided in Appendix 1 that accompanies this response.

WIND ENERGY IRELAND

Baringa's Pathway to a Zero-Carbon Power System

Baringa

We demonstrate a path to zero carbon in the Irish electricity sector using known technologies, keeping the lights on and at minimal cost to consumers



	70 by 30 (3.3 $MtCO_2$)	Less than 2 $MtCO_2$	80% of PfG Capacities	Same CO_2 price as non-ETS	Long-Duration Storage	Green Hydrogen	Storage & Hydrogen	Zero Carbon (100% of PfG)
RES-E	70%	85%	94%	94%	97%	89%	90%	101%
PfG Capacity	50%	67%	80%	80%	80%	80%	80%	100%
Residual CO_2	3.31 Mt	1.62 Mt	1.31 Mt	0.97 Mt	0.68 Mt	0.48 Mt	0.28 Mt	0 Mt

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Figure 1: Summary of Pathway to a Zero-Carbon Power System in Ireland Emissions Savings

Integrating the volume of renewable generation envisioned in the PfG will bring challenges that need to be addressed if we are to manage the dispatch down of wind generation and use our renewable resources in the most effective manner. Key to achieving this will be ensuring sufficient capacity in the electricity transmission system to minimise constraints and enabling higher SNSP levels and lower fossil fuel minimum generation levels through the DS3+ programme. A summary of the key steps needed to achieve less than 2 million tonnes of CO_2 in the electricity sector are as follows:

3.1.1.1 Ensure Sufficient Grid Capacity

There is currently a lack of transmission capacity in areas of the country where large numbers of renewable projects are planning to connect and this is going to be the biggest barrier to meeting our 2030 targets. Many connected renewable generators are already seeing very high constraint levels particularly in the West and North-West due to network limitations which means that a huge amount of renewable electricity is going to waste. There is a high risk that without significant investment in our grid infrastructure these constraint levels will reach into double figures, for both existing and future projects, if the grid is not reinforced in time for the future pipeline. This will affect the commercial viability of projects entering the development pipeline, as some projects may not be able to connect to the system until the relevant grid reinforcements are in place, which could take several years. This will also drive up the overall costs of renewable development as these constraint levels will be reflected in higher RESS auction bids, and ultimately paid for by consumers via the PSO levy. EirGrid's Tomorrow's Energy Scenarios 2019 System Needs Assessment report identified the need for grid development in all scenarios analysed, with the highest need evident in areas such as the East Coast where large volumes of offshore wind are planning to connect and in the West, North-West and Midlands to accommodate increases in onshore wind.

Saving Power[4] is one part of the WEI 70by30 Implementation Plan that sets out how we can minimise dispatch down and maximise the use of renewable electricity on our grid by 2030. Implementing the recommendations in Section 9.1 is essential to building a modern electricity system, one designed for an Ireland powered by wind and solar rather than coal and gas, and will create a firm foundation on which to build a zero-carbon Irish energy system. These changes will cut CO_2 emissions, cut the price of renewable electricity and cut fossil fuel imports. WEI's recommendations for the CAP in relation to grid development are as follows.

Shaping our Electricity Future Roadmap

Action 34b of the Interim Climate Actions 2021 sets out timelines for EirGrid's Shaping Our Electricity Future (SOEF) consultation and publication of the final roadmap. From our review of EirGrid's consultation, the TSO is falling short on grid development for the capacity targets outlined in the PfG. EirGrid need to focus on the capacity targets in the Climate Action Plan and Programme for Government (8.2 GW of onshore wind and 5 GW of offshore wind by 2030) rather than just achieving 70% RES-E by 2030.

[4] https://windenergyireland.com/images/files/iwea-saving-power-report.pdf

Network development needs to allow these targets to be delivered. The focus cannot be on delivering the bare minimum for 2030 as this should be seen as a point in the road in terms of the net-zero 2050 target. Creating sufficient transmission system capacity to meet these installed capacity targets by 2030 is a critical enabler of a decarbonised electricity sector. WEI recommend that a specific action be included in the CAP requiring the creation of this level of transmission capacity using a combination of wires and non-wires solutions.

Create a Grid Capacity Advisory Council

WEI proposes that as an action in the final CAP 2021 the CRU and System Operators establish a Grid Capacity Advisory Council (similar to the DS3 Advisory Council) as a mechanism for the System Operators, Regulators, industry and other stakeholders, including planning authorities and relevant Government Departments, to engage and work collaboratively on these matters. This would provide a forum for stakeholders to monitor progress and discuss issues which may impact on the delivery of new grid infrastructure as projects progress through the grid development process. It is not intended that this would be a project specific forum, rather it would discuss and develop overall grid policy for Ireland.

In relation to specific projects or regions of the grid, we propose that project delivery management boards be set up for each of the six regions identified in the TES 2019 System Needs Assessment report. These would be similar to the board established several years ago between EirGrid and ESB Networks for the delivery of the South West 220 kV projects, which worked very well. By comparison, no similar delivery board was established in the North-West and as a result the Renewable Integration Development Project (RIDP) has failed to make progress and has in fact in recent years taken a step backwards. These boards would oversee and ensure the successful delivery of the grid connections and reinforcements needed within the respective areas. We believe there should be representatives from the System Operators, CRU, DECC, and industry representatives which could then feed into the Grid Capacity Advisory Council.

Update of TSO Technology Toolbox and Alternative Network Solutions Needed

Given the challenges associated with delivering new network, utilisation of existing available technical solutions to “sweat” the existing network is a critical element of transmission and distribution system development. Dynamic line rating should be deployed as standard with priority being given to constrained parts of the network. Deployment of power flow control devices to balance flows on the existing network should be expedited. WEI would also support the development of a new suitably designed congestion management service proposed in EirGrid’s SOEF consultation to allow new developer-led innovations including storage technologies to be deployed on the grid. The design of this product would need to consider the nature of the technologies available to solve the problem. Where zero / very low marginal cost technologies are suitable, they will likely be deployable on the grid at lower costs if they are provided with greater long term revenue certainty. In this respect, the design of the service may in fact determine whether the technology solution can be delivered in a commercially viable / sensible manner for consumers.

3.1.1.2 Deliver DS3+ and remove all existing system operation constraints by 2030

If a system security issue can be addressed by dispatching down any renewable generator across the entire national grid, then this dispatch down is referred to as curtailment. Curtailment is used to manage challenges which impact the entire system and are not locational in nature. For example, at the time of writing the maximum percentage of electricity that can be provided by wind power in Ireland for system security reasons is 70% of demand and electricity exports, so when wind farms produce more than this, it has to be curtailed. Substantial progress has been achieved by EirGrid over the past decade in increasing the SNSP limit to 70%, with ongoing trials of 75%. However, EirGrid's own reporting shows that the majority of curtailment is due to minimum generation levels from fossil generation at time of high wind generation.

The priority for the next DS3 programme to enable 2030 levels of RES-E should be the reduction of minimum generation levels through the increased connection of technologies providing zero carbon system services. WEI strongly recommend that the next CAP has a specific action for EirGrid and the CRU to reduce the minimum generation constraint level to zero by 2030 and implement a system capable of supporting 100% of demand being met by non-synchronous renewable generation at any one time. This target should be supported with an interim target to reduce minimum generation levels substantially by 2025.

Higher RES-E penetrations and lower carbon emissions could be enabled by the complete removal of operational constraints. Baringa's 'Pathway to a Zero-Carbon Power System' analysis shows that removing existing system operational constraints could save over 1.5 Mt of CO2 by 2030 compared to levels in a 70% RES-E system.

Delivering these operational changes will also require operational policy changes in how EirGrid manages the system with increased penetration of renewables and reduced operating of thermal conventional generators. This will require new practices and procedures in the control centre to grow confidence and experience in operating with large amounts of renewables and new system support technologies. More analysis will be needed to understand dispatch down events and to gradually move away from fossil fuel generators as the providers of system security.

Action 38 of the Interim Climate Actions 2021 outlines the development of the enduring DS3 system services framework. We welcome commencement of the 75% SNSP trial and steps to make this operational policy by Q2 2021. However, the decision on the high-level design of enduring DS3 framework is delayed until Q4 2021 as per the SEMC's most recent paper on the enduring system services arrangements. Therefore, the implementation of new DS3 System Services market design is delayed from its original target date of Q1 2023 until at least Q2 2024.

Clear investment signals are needed to support the development of new low carbon system service providers over the next decade. The CRU has recently announced a procurement framework for new sources of zero-carbon inertia. This will be critical to reducing the minimum generation constraint

that exists on the system today. We suggest the final CAP includes a timeline for the implementation of this procurement framework including a timeframe for service delivery.

We also recommend the final Shaping our Electricity Future roadmap should set out a path to 100% SNSP by 2030. The electricity system must be able to operate with zero carbon system services by 2030. A roadmap needs to be set out to deliver this including the ability for the power system to operate without a 'minimum generation units online' constraint on the system. More clarity is needed on future system service needs, timelines and volumes to enable the market to deliver the right investment.

As part of this roadmap, we also suggest that EirGrid start measuring and reporting on energy market and non-energy market (non-energy action) emissions and the cost of the constrained run. The TSOs often position units away from the energy market schedule in order to meet system service requirements or due to network constraints. These are known as non-energy actions. The recommendation is for the TSOs to model electricity system CO_2 emissions to compare energy market emissions and actual electricity generation emissions to calculate the non-energy market emissions contribution. Or in other words, the emissions solely related to actions that are required to ensure the electricity system remains stable. As new low carbon system service and other flexible technologies come on the system it will be important to track and measure how these are being utilised and their impact on power sector emissions. Right now, this is not being measured and so it cannot be managed.

3.1.1.3 Interconnection

Systems with high levels of distributed variable renewable generation need flexibility to respond to changes in generation and demand to maintain the stability of the power system. Interconnection is a proven and mature technology that can provide this flexibility along with many other benefits.

Power flows on the interconnector are a result of market signals i.e., whether an interconnector exports or imports is dependent on the difference in electricity prices between markets. Interconnection helps drive competition by allowing markets access to other generation sources, which lowers costs to consumers, particularly by allowing markets to share low-cost power plants and by reducing renewable curtailment by enabling an export market for surplus renewable generation. It also brings security of supply benefits by sharing generation across markets thus reducing our need for conventional fossil fuel generation capacity.

Action 34d in the Interim Climate Actions 2021 sets out a timeline for the planning application for the Celtic Interconnector to be complete by 2025. There is no timeframe set out for delivery of the interconnector, even though there is in the case of the North South Interconnector. This should be addressed in the final CAP and a timeline put in place for completion of the Celtic Interconnector by 2026. This is an important step to facilitate increased levels of renewable generation and minimise curtailment.

There is also no timeline put forward for next steps or completion of the Greenlink Interconnector. We believe a CRU decision on the final regulatory framework for Greenlink should be included as a relevant action to be completed as soon as possible this year as clarity is needed for this project to progress to the next stage of development.

There are also no actions set out for interconnector operation and timelines for post-Brexit trading arrangements to be put in place. In the SEM, the ability to trade electricity across the East-West and Moyle Interconnectors with GB means access to larger wholesale trading markets, price convergence, increased economic efficiency and improved capability of the grid to accommodate higher volumes of renewable energy and facilitate efforts to address climate change. The current trading arrangements pose significant challenges to the efficient operation of the SEM. Consequently, WEI supports a fast transition towards a new enduring trading arrangement between GB and the EU, with an understanding that the new arrangements for allocation of capacity on interconnectors in the day-ahead market will be based on the concept of "multi-region loose volume coupling".

WEI believes that an implementable solution for 'Multi-Regional Loose Volume Coupling' (MRLVC) is urgently required, and so it welcomes the recently completed cost-benefit analysis on this solution by ENTSO-E. WEI notes that under the Trade and Co-operation Agreement with GB, new procedures for MRLVC must be in place within 15 months of the 1st of January 2021, that is by April 2022. It is our view that in order to achieve these timelines it would be preferrable to focus on a single solution for the next phase of analysis and implementation.

3.1.1.4 Additional Steps to fully decarbonise the Electricity Sector

CO2 Pricing in ETS and non-ETS sectors

As shown in Figure 1, and further detailed in analysis by Baringa Partners included as an Appendix to this submission, increasing carbon pricing acts to deter fossil fuelled generation in Ireland. The modelling shows that by increasing the ETS carbon price from €50/tCO_2 to €100/tCO_2, it acts to remove 0.34Mt of CO_2 of the 1.31 $MtCO_2$ remaining in Ireland under the 80% of the PfG capacity targets scenario.

This scenario assumes that the ETS carbon price in I-SEM is brought into alignment with the non-ETS price of €100/tCO_2 by 2030. The analysis also makes the conservative assumption that the neighbouring GB and French markets adopt the same €100/tCO_2 carbon price. An asymmetric carbon price, i.e. a greater price in I-SEM than in GB and France, would result in larger emissions savings in the Irish power sector.

The carbon price movement acts to increase the short-run marginal cost (SRMC) of a 46% fossil gas-fired plant by around €20/MWh, further out of merit in the I-SEM system.

As a result, domestic fossil gas generation in Ireland is decreased from 3.5 TWh to 2.6 TWh, with NI gas-fired generation down from 1.8 to 1.4 TWh from the carbon price movement alone.

Imports to I-SEM act to replace the lost domestic thermal generation with net exports from I-SEM decrease from 2.8 to 1.6 TWh.

This essentially means that the interconnectors trading is set more by carbon production across the three regions than if the CO_2 price were lower. Effectively, we import more when there is less renewable generation available in Ireland, and similarly, we export more when there is less renewable generation available in GB and France. This demonstrates that a CO2 price floor of €100/tCO_2 is a policy with considerable merit for the I-SEM over the decade.

Long-duration Storage Technologies

The analysis by Baringa Partners further shows the benefits of long-duration storage assets such as pumped storage, compressed air storage, or long-duration batteries which add flexibility to the I-SEM system and act to reduce curtailment of renewables.

Once the power sector in Ireland reaches a point of having less than 2 Mt of CO_2, Baringa Partners considered the impact of 800 MW of 100-hour duration storage capacity being deployed throughout ROI and NI, with an average round-trip efficiency of 60%, and the impact which this would have on further reducing CO_2 emissions in the power sector.

This capacity is representative of several emerging technologies including:

- Long-duration pumped hydro energy storage;
- Compressed air energy storage;
- Thermal energy storage (e.g. liquid salt, 'hot rocks'[5]);
- Liquid air energy storage[6];
- and novel battery compositions, e.g. vanadium redox flow, NaS and NaNiCl2 batteries.

The long duration of the storage assets allows them the flexibility to take in excess renewable generation during low demand hours, and export that energy when it is most needed during hours of low renewable output. Correspondingly the volume of RES curtailment in I-SEM is reduced to around 1.8 TWh compared to previous scenarios where long-duration storage was note examined.

Generation of the storage assets displaces domestic fossil fuel-fired plant, reducing fossil gas generation to 1.8 TWh in Ireland, down from 2.6 TWh in the previous scenario.

Power sector emissions are reduced in proportion, down to 0.68Mt of CO_2 in Ireland, a drop of 0.28 Mt of CO_2.

[5] https://www.rechargenews.com/energy-transition/stiesdal-hot-rocks-energy-storage-technology-stoked-by-andel-funding-boost/2-1-998021?utm_content=buffer82f9d

[6] https://www.environmentalleader.com/2021/04/construction-to-begin-on-worlds-largest-liquid-air-energy-storage-project/

This demonstrates the potential benefits of long-duration storage for Ireland, and incentives for the rollout of these technologies should be put in place to encourage their usage in helping us get to a zero-carbon power system as soon as possible.

Green Hydrogen Production

The only Green hydrogen related Action in the Annex of Actions, Action 54, focuses on decarbonising the Natural Gas Grid. This Action is welcome, as Green Hydrogen will play an important role in decarbonising the gas grid. However, it is important that Green Hydrogen is considered across all sectors of the energy system, as it will be crucial to the future electricity system, as well as decarbonising those sectors that cannot be directly electrified easily, such as aviation, shipping, industrial heat etc., and helping Ireland to reach net-zero. All potential sectors need to be considered now to establish the role green hydrogen will play in the Irish energy system.

In the appended analysis of a 'Pathway to a zero-carbon power sector in Ireland', the levels of renewable penetration in the 'Less than 2 MtCO2' scenario induce around 1,500 hours of zero price in the day-ahead market. This figure increases to over 2,100 hours in Phase 2 scenario A.

Zero price hours arise when wind and solar plant, bidding at zero cost, are able to provide enough generation to meet demand levels in the day-ahead market. Any excess RES generation must either be exported to neighbouring markets via interconnectors or curtailed as oversupply.

The analysis examined the impact which an installed electrolyser capacity of 1,600 MW throughout I-SEM by 2030 would have in reducing CO_2 emissions. These electrolysers are configured to produce hydrogen when day-ahead prices fall below 50 €/MWh.

It assumed that the hydrogen produced is utilised in generation assets during the hours of highest price, displacing fossil gas offtake in these hours. To allow this targeted hydrogen offtake, we have assumed that storage volumes are not a limiting factor in this scenario, with 3 and 1 TWh of hydrogen storage available in ROI and NI respectively.

The results show that of the 2.6 TWh of gas-fired generation in Ireland in this scenario, approximately 1.3 TWh is hydrogen-fired. Power sector emissions are reduced as a result by 0.49 Mt of CO2 in Ireland from this displacement of fossil gas relative to scenario A. The electrolysers act to increase the domestic I-SEM demand during low price hours, acting to reduce renewable curtailment.

The electrolyser capacity is assumed to have a power-to-hydrogen efficiency of 70%. 1,600 MW of capacity produces 3.9 TWh of hydrogen from 5.6 TWh of electricity during hours of day-ahead price below 50 €/MWh.

The electrolysis-weighted cost of production is around 15 €/MWh. Green hydrogen produced at these power prices is cost-competitive relative to fossil gas-fired generation under an ETS carbon price of €100/tCO2.

This hydrogen is utilised for generation within 900 MW of retrofitted fossil gas-fired capacity in ROI and 300 MW in NI. The hydrogen-fired units are dispatched when day-ahead prices exceed 80 €/MWh, displacing fossil gas generation during these hours.

Hydrogen can be stored cryogenically or in high pressure tanks, or more economically, in underground caverns where the geology permits.

Retrofitting the I-SEM gas fleet is considered technically achievable according to suppliers such as GE, Siemens and Mitsubishi. It should be noted however that all gas customers, as well as the gas transmission and distribution system, would need to convert to a hydrogen blend (or 100% hydrogen) at the same time. It was outside the scope of the Baringa study to determine the feasibility, economics or timing of such a change, but it does prove that it is technically possible.

This analysis by Baringa and, other recent analysis by MaREI shows the potential role Green Hydrogen will play in getting Ireland's electricity system to zero-emissions. Green Hydrogen will also provide a new route to market for wind energy in Ireland, unlock a massive export opportunity to European countries in need of Green Hydrogen and other Electrofuels, and enable us to make the most of our significant offshore wind resources.

If this opportunity is to be realised, immediate action is needed. WEI recommends the Government develops an ambitious Green Hydrogen Strategy, assessing the future role of Green Hydrogen for Ireland and putting a framework in place to facilitate this. This should be released no later than Q4 2022.

3.1.1.5 The Electricity System in 2050

A report by the MaREI Institute published in March 2021 titled '*Our Climate Neutral Future – Zero by 50*'[7] shows how Ireland can deliver a net-zero carbon emissions energy system by 2050. The report projects significant increases in electrification of heat and transport over the coming decades which will mean electricity demand could grow by 3-4 times from 29 TWh today to 84-122 TWh by 2050. The majority of this demand will be met by wind energy and we will need approximately 25 GW of renewable capacity. This is a substantial increase from the 4.5 GW of renewable capacity we have on the system today.

Figure 2 below shows the increases in electricity generation forecast to 2050 and the increases in capacities for technologies such as wind, solar, storage and decarbonised gas (assumed to be green hydrogen).

This shift will also have enormous benefits for our energy security as our dependency on imported fuels will drop from around 70% of our energy mix today to 5% in 2050. This requires a resilient electricity system with adequate flexibility, underpinned by grid development, flexible loads, sufficient capacity, interconnection and storage.

MaREI also estimate that net-zero could create at least 50,000 jobs in Ireland.

Our overall primary energy will decrease and primary energy per capita also sees large reductions from 32 MWh/capita in today's system to 22 MWh/capita in 2050 due to greater efficiencies in electrification.

[7] https://windenergyireland.com/images/files/our-climate-neutral-future-0by50-final-report.pdf

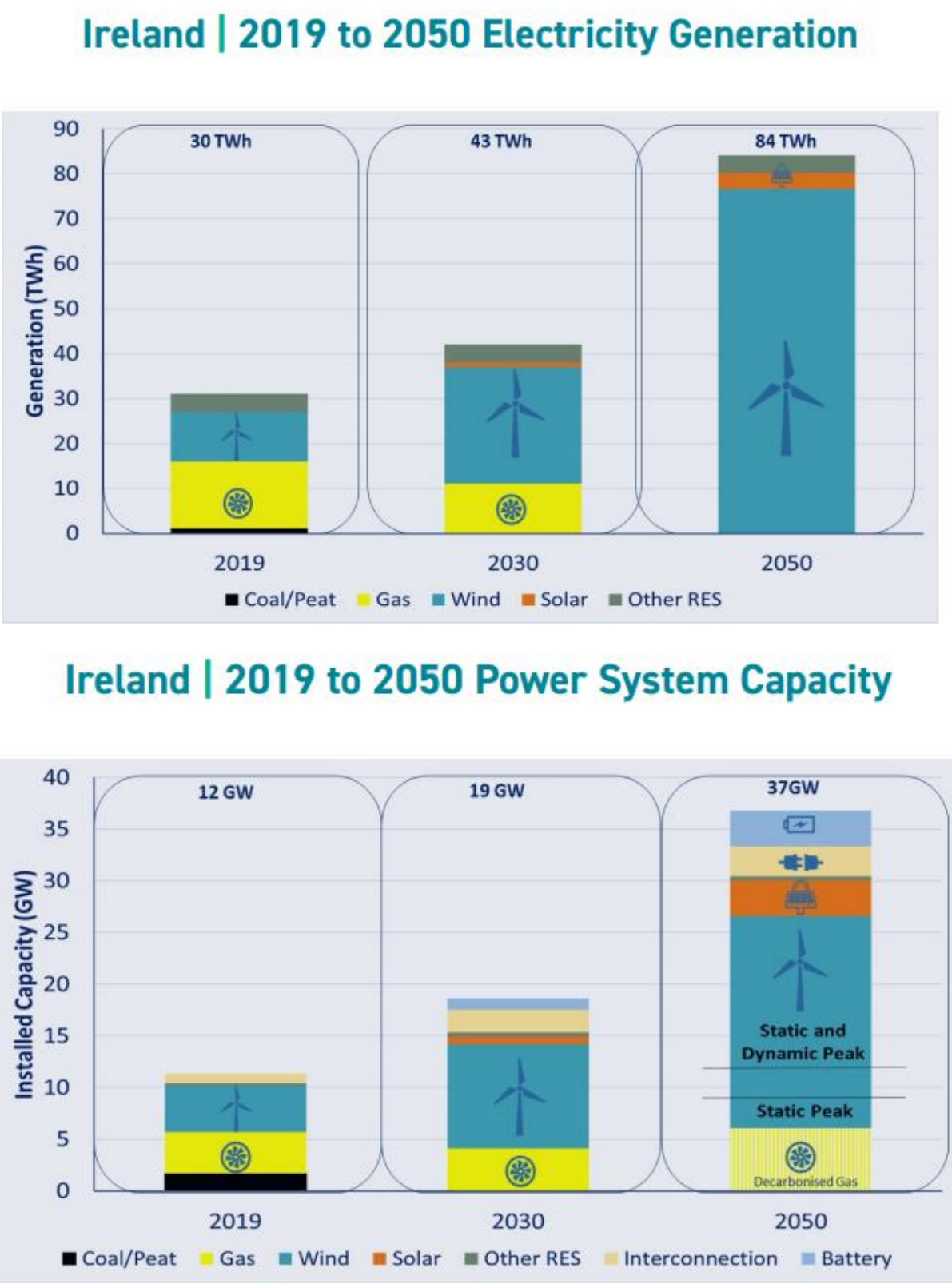


Figure 2: Power System Generation and Power System Generation Capacity in Ireland from 2019 to 2050 (UCC MaREI)

3.1.2 Delivering 8.2 GW of Onshore Wind

WEI's Building Onshore Wind report,[8] which is part of the 70by30 Implementation Plan, identified 9 critical Policy improvements (PIs) which, if introduced, would allow the achievement of the 8.2 GW target for onshore wind set out in the Climate Action Plan. The PIs identified are summarised in Section 9.2.

The Clean Energy Package requires Ireland to meet interim targets of 45% RES-E in 2022, 53% in 2025 and 59.5% in 2027. Given the lead time on delivering sufficient offshore wind generation to meet the 5 GW Programme for Government target by 2030, it will be particularly important that new onshore renewable generation is facilitated via the planning and grid policy framework and has a regular route-to-market through RESS and CPPAs to help meet the 2022, 2025 and 2027 targets.

Figure 3 below shows the increases in renewable generation that will be needed to reach our interim CEP targets and at least 70% RES-E by 2030. From a base case of 11 TWh of renewable generation in 2020 this must increase to at least 25 TWh by 2027 and just over 30 TWh by 2030 (compared against EirGrid's median demand scenario). The majority of renewable generation growth in the interim years will be delivered by onshore wind and this must be fully supported in the CAP 2021.

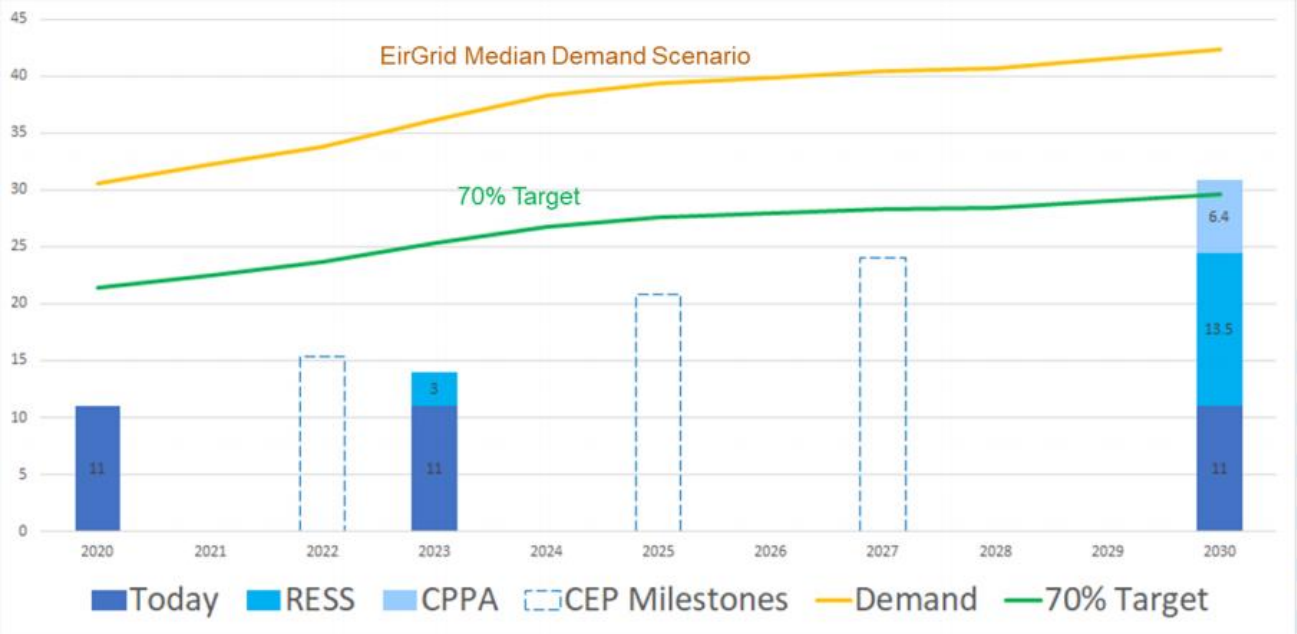


Figure 3: Quantity of renewable energy required to meet interim targets in 2022, 2025 and 2027

Our analysis shows that failing to deliver the PIs in the table below would leave us almost 3 GW short of achieving our 2030 onshore wind target.

[8] https://windenergyireland.com/images/files/iwea-building-onshore-wind-report-lr.pdf

WEI Comments re Climate Action Plan 2021 – Actions Relevant to Onshore Wind

RESS Auction Timelines

Action 35 in relation to RESS 2 does not go beyond publishing a timetable for the RESS 2 auction in Q2 2021. Clarity is needed on the timelines for the implementation of the RESS 2 auction and further auctions as soon as possible. A schedule should be included in the final CAP 2021 on all further RESS auctions. This is needed to maintain confidence in the renewables industry and the onshore renewable pipeline that a route to market will be in place in the coming years. The most recent WEI onshore wind pipeline analysis shows that there is over 10 GW of onshore wind in development. A viable route to market via RESS or CPPA will be needed to ensure competition, lower renewable deployment costs and deliver on our renewable targets.

Corporate PPAs

The CAP 2019 set a very ambitious target of ensuring that 15% of electricity demand in 2030 is met by renewable sources contracted under corporate power purchase agreements (CPPAs). To facilitate this, a number of steps were set out in Action 29 of the CAP 2019, with a Policy Paper to be published in Q3 2020, and the implementation of the approved recommendations to take place in Q4 2020. These target dates were not met. Under the updated Annex of Actions, a high-level roadmap for incentivising the uptake of CPPAs is to be published in Q4 2021. WEI feels this is an important piece of work that should not be delayed any further.

There has been some progress in CPPA procurement here, with four CPPAs announced to date covering 258 MW of onshore wind capacity; however only one of them is currently operational. Based on EirGrid's median demand scenario however, 15% of electricity demand in 2030 will require approximately 2,000 – 2,500 MW of onshore wind. Significant action will be needed if the 15% target is to be achieved, as there are currently a number of barriers to CPPA procurement in Ireland. These are expanded on in WEI's CPPA Position Paper[9], but some of the main issues that need to be addressed are shown below:

- **Lowering the cost of developing on and offshore wind in Ireland is fundamental to supporting the development of CPPAs in Ireland**. Cost is a significant determinant for any CPPA, and Ireland is currently an expensive market, competing with cheaper European jurisdictions. WEI proposed a series of measures to lower the costs of wind-generated electricity in our *Saving Money* report[10]. We would also recommend that the Climate Action Plan adopts a further recommendation from that report which is that an independently chaired task-force should be established as soon as possible to bring together industry, consumers and the relevant Government departments with the sole remit of identifying ways to reduce the price of renewable electricity in Ireland.

[9] https://windenergyireland.com/images/files/wind-energy-ireland-corporate-ppa-position-paper-february-2021.pdf
[10] https://windenergyireland.com/images/files/final-iwea-70by30-saving-money-report-may-2020.pdf

- **The use of private wire generation for large industrial energy users needs to be facilitated** . This is prevalent in many other countries but blocked by regulatory and legal barriers in Ireland. This is contrary to the Clean Energy Package. WEI welcomes the inclusion of this issue under Action 31 of the updated Annex of Actions as it needs to be addressed.
- **Permit-granting procedures are too complex and lengthy.** Short and simple permitting processes, in line with Article 16 of the Clean Energy Package, are key to increasing the supply of renewable projects for CPPAs.
- **Demand sites engaged in CPPAs should be given a reduction in their PSO charge, proportionate to their total MWh of CPPA generation over their overall demand**. It does not appear to be equitable that a corporate engaging in a CPPA would also have to pay a PSO Levy for the electricity consumption.
- **Corporates should be given the ability to retire GoOs, in line with European standards**. At present, corporates in Ireland are unable to retire GoOs and must contract with a supply company to do so. This acts as a barrier to CPPAs. WEI also believes that GoOs could be used to track electricity produced by CPPAs, by applying a CPPA flag to these GoOs that originate from CPPAs.

Repowering

An additional area that should be included in the final CAP 2021 is repowering of renewable projects. Repowering of projects is vital if we are to reach 8.2GW of onshore wind. It can provide a host of benefits. Chief among them is the ability to continue using productive wind farm sites that have already been developed and have existing grid infrastructure. Installing modern technology on these sites can also vastly increase their installed capacity and annual energy production. Repowering projects in the UK have on average resulted in a capacity increase of 121 per cent[11]. Across Europe, capacities have more than doubled[12].

Modern wind turbines today can operate for 35 years while those installed initially were typically designed to operate for 20-25 years. Analysis by WEI in 2019 shows that by 2025, 422 MW (around 10% of today's installed capacity) will be 20 years or older. Looking ahead to 2030, almost 1,400 MW (1/3 of today's installed capacity) will reach this age bracket. Ireland cannot afford to lose any MW from the system. Not facilitating repowering would be a missed opportunity for Ireland and would make the Government's ambitious target of 70 per cent renewable electricity by 2030 all the more challenging. Projects seeking to repower in the mid to late 2020s will need to enter into the planning system in the coming years. This is a not an issue we can afford to avoid.

Recent policy proposals have not fully considered the need and importance of repowering. For example, we have concerns that the Draft WEDG19 as currently drafted would not allow Ireland to comply with Article 15 and 16 of the Renewable Energy Directive to provide for a simplified and swift permitting process, which is proportionate to the continuation of an established use. Provisions in

[11] An assessment of end-of-life decision making for commercially managed onshore wind schemes

[12] WindEurope Wind Energy in Europe: Outlook to 2023: https://windeurope.org/wp-content/uploads/files/misc/WindEurope-Market-Outlook-to-2023-exec-summary.pdf

the Draft WEDG19 need to be reconsidered with these objectives in mind. The lack of flexibility in the current draft and absence of a swifter and more simplified process for repowering needs to be addressed.

Repowering projects wishing to enter RESS 1 were also required to demonstrate 'a 50% increase in installed capacity compared to the previous renewable energy generation project at that site'. This is a requirement that many prospective repowering sites will not be able to achieve due to difficulty in obtaining a grid connection offer for this increased capacity, the capability of the electricity grid to accommodate this increase in capacity, or failing to obtain consent for larger or more turbines. This requirement acts as a barrier to repowering and may result in projects that would have repowered being forced to decommission.

There are other barriers which could prevent the repowering of many Irish wind farms including the absence of a regulatory framework for repowering, the presence of Natura 2000 sites and a lack of guidance as to how repowering applications in or near these sites should be assessed and a lack of available grid capacity. If these barriers are not addressed, large capacities will be needlessly decommissioned. We face the prospect of installed renewable generation in Ireland falling, at the time it needs to be increasing.

To address these issues, we recommend the following:

- The Climate Action Plan should include an action requiring a strategy for repowering to be completed by end of Q4 2023.
- Implement the requirements of the Clean Energy Package, as they relate to repowering as outlined in the previous section.
- Ensure that repowering projects can compete in future RESS auctions on a level-playing field with new builds and are not subject to any strict pre-conditions.
- In relation to grid, a lack of capacity must not prevent or limit projects. Given the timelines needed to deliver transmission infrastructure, a more proactive approach to transmission network upgrades is needed.

Implement Article 15 and 16 of the Renewable Energy Directive to streamline planning process and ensure 8.2GW can be delivered by 2030

The Renewable Energy Directive, part of the EU's Clean Energy Package, was finalised in 2018. Article 15 stipulates national rules for authorisation, certification and licensing procedures shall be proportionate and necessary, expedited at the appropriate administrative level within predictable timeframes.

Article 16 states that the permit granting process shall take no more than two years with a one year extension possible in "extraordinary" circumstances and that Member States establish a single point of contact to guide and facilitate the entire permitting process i.e. a "one-stop-shop" for permitting. The Directive also calls on Member States to facilitate repowering by ensuring a simplified permit-

granting process, not exceeding one year, with allowances for a year-long extension in "extraordinary" circumstances.

These provisions need to be transposed into national law by 30 June 2021. The two-year timeline would be a vast improvement as the planning and permitting phase of a Wind Farm can typically take 4-8 years at present. This is mainly due to the timeframes required to go through the planning process and time lost between submitting a grid connection application, receiving a grid connection offer and receiving consent for the grid connection. In addition, the permitting process in Ireland encompasses a host of other permits involving multiple Consenting Authorities and Government Agencies e.g. the CRU's Authorisation to Construct and Licence to Generate; Road Opening/Closing Licences from the Road Management Office and Felling Licence Grant from Department of Agriculture. Streamlining and speeding up the process of progressing these permits represents an opportunity to introduce meaningful and transformative change to the planning process in Ireland.

WEI's 2019 pipeline survey of the future onshore and offshore wind generation development for Ireland found that projects with an existing capacity of at least 285 MW are currently planning to repower in the coming years. Implementing these EU requirements would ensure Ireland is well placed to benefit from the numerous potential benefits associated with repowering. With projects already in the pipeline, not facilitating repowering would be a missed opportunity for Ireland and make the Government's climate action targets for the electricity sector more difficult to achieve.

Many of the planning recommendations we make in this submission, would go towards achieving what is required under Articles 15 and 16. More will be required, however, particularly in relation to the requirement to establish a single point of contact and repowering to deliver on what is intended by the Directive. We look forward to engaging with the relevant Government Departments on this to realise the potential wide-ranging potential benefits of Articles 15 and 16 of the Renewable Energy Directive.

The implementation of Articles 15 and 16 needs to be identified as key action in the Climate Action Plan 2021 to ensure Ireland is able to deliver 8.2GW of onshore wind by 2030. The Articles need to be implemented from the perspective of new projects and repowering projects.

Hybrid Projects

The Climate Action Plan 2019 contained actions in relation to hybrid projects but very little progress has been made to date in resolving barriers such as multiple legal entities behind connection points and sharing of MEC for separate technologies behind a connection point. Clarity is also needed on the mechanisms for hybrid projects to participate in RESS auctions. Unlocking the potential for hybrid projects has significant capacity to optimise existing generation sites and grid infrastructure while minimising renewable dispatch down and reducing project development costs.

The interim CAP targets removed actions related to facilitating hybrid projects. We recommend these are re-instated and that the final CAP 2021 should set out a roadmap for removal of barriers to hybrid projects and provide clarity to developers looking to develop hybrid projects.

3.2 WEI Response to Question 2: What can be done to increase the uptake of offshore wind and solar PV in particular in the context of the Programme for Government ambition?

WEI's Building Offshore Wind report,[13] which is part of the 70by30 Implementation Plan, identified eight critical Policy Improvements (PIs) which could be made to speed up the offshore development process and deliver 5 GW of offshore wind by 2030.

The eight Policy Improvements are:

- PI1: Issue Foreshore Licences and exclusivity for the seabed to all 2030 projects by Q4 2021;
- PI2: Complete the National Marine Planning Framework (NMPF) by Q4 2020;
- PI3: Enact the Marine Planning and Development Management (MPDM) Bill by Q1 2021;
- PI4: An Bord Pleanála will need sufficient resources so they can make decisions on offshore wind planning applications in 1.5 years on average;
- PI5: EirGrid and ABP need to engage with projects from the outset so projects can get a final grid offer and consent for a grid connection within 1.5 years on average after a RESS auction;
- PI6: Financial close and construction of the wind farm and grid connection should take 3 years or less (including energisation);
- PI7: Three RESS auctions need to occur by 2025 with sufficient volumes and competition;
- PI8: Work must commence immediately on strengthening the capacity and flexibility of the grid to accommodate 5 GW of offshore wind by 2030.

Our analysis in the report indicates that, without these policy improvements, Ireland will only deliver 670 MW of offshore wind by 2030, which is a long way short of our 2030 targets.

This report identified transmission grid development as the most significant barrier to achieving the 5 GW target. WEI's recommendations for grid development to be included in the Climate Action Plan 2021 are summarised in Section 3.1. The recommendations include an EirGrid, ESB Networks and Industry East Coast delivery board to ensure the necessary onshore transmission reinforcements are delivered on schedule.

A summary of the remaining recommendations, timelines and relevant stakeholders in relation to offshore wind is provided in Section 9.3. We recommend that these recommendations are included as actions in the final Climate Action Plan 2021.

WEI Comments on the Climate Action Plan 2021 – Actions Relevant to Offshore Wind

WEI is concerned with continued delays to key offshore enabling policies such as the planning framework, grid connections and RESS auctions and the knock-on impacts this has on the offshore industry and our ability to deliver 5 GW of offshore wind by 2030. There are a number of actions relevant to offshore wind in the Interim Climate Actions 2021 and we comment here on a number of these as well as address others that should be included in the final Climate Action Plan 2021.

[13] https://windenergyireland.com/images/files/20201203-final-iwea-building-offshore-wind-report.pdf

MPDM Bill (MAP Bill)

The interim CAP 2021 has an action for the MPDM bill (recently renamed the MAP Bill) to be enacted by Q2 2021 and all secondary legislation to be finalised by Q4 2021. We are very concerned with the delays in the enactment of this bill and the potential impacts these delays may have on secondary legislation timelines. This Bill is crucial to the development of the offshore industry in Ireland and need to be enacted as a matter of urgency to provide projects with clarity on the planning process.

Offshore RESS

While the Interim Climate Actions 2021 puts forward a timeline for O-RESS 1 to be launched by Q4 2021, no clarity is provided on further auction timelines or steps. We request clarity is provided on this, and on future O-RESS auctions, in the final CAP 2021 for the developing offshore wind pipeline. The timing of the auctions will be a particularly critical factor to ensure sufficient competition and in providing clarity for the developing offshore pipeline and supply chain; this will be a major factor in ensuring Ireland can deliver 5GW of offshore wind by 2030, in line with the PfG ambition.

Offshore Grid Connection Policy

WEI welcomes the publication of the Policy Statement on the Framework for Ireland's Offshore Electricity Transmission System. However, there remain a number of questions that require clarification.

Firstly, clarity needs to be provided on the timing of O-RESS auctions given the three proposed transition phases from the current decentralised to the centralised model, post 2030. Secondly, the Policy Statement outlines that ownership of the offshore transmission system will rest with EirGrid at all stages of the phased transition, regardless of whether the grid has been planned and developed by the individual renewable energy projects or the TSO. WEI Members have expressed concerns about the uncertainty this brings regarding the contractual framework for guaranteed availability and Operation and Maintenance (O&M) of the cable asset, combined with a current lack of resource skillset or demonstrated track record from the TSO of managing offshore generation infrastructure.

Additionally, further information will be needed on the requirement for developers to accord to functional specifications provided by EirGrid. The provision of clarification on these matters as soon as possible will be essential to ensure that the best value is delivered to consumers in upcoming RESS auctions.

Clarity required on OREDP 2

In order to provide the needed certainty and longer-term visibility for projects to be delivered after Phases 1 and 2 in particular, there is a need for a timeline on OREDP 2 to be set out as early as possible. It should also be made clear how organisations such as WEI will be given the opportunity to input into the development of the Plan. OREDP 2 should also consider including provisions for the 30

GW Atlantic ambition outlined in the Programme for Government and for Marine Renewables Emerging Technologies.

Supply chain

Policy certainty for planning, grid and markets is badly needed to provide confidence to the international supply chain. Other jurisdictions are providing much greater certainty to the international supply chain, and doing so much earlier, than Ireland.

Supply companies on which Irish offshore wind energy developers might be seeking to rely are already filling order books for 2024/25 and international confidence in Ireland meeting its Climate Action Plan targets is not high.

We recommend that the Department of Transport be given responsibility for carrying out a review of ports to identify both an east and a west coast port suitable for facilitating the construction of offshore wind farms. This review to commence before the end of Q3 2021 and to conclude before the end of Q2 2022.

Separately, the Department of Enterprise, Trade and Employment should be tasked with developing an industrial strategy for renewable energy to ensure that the job, investment and supply chain opportunities that will be generated by offshore wind energy, and renewables more generally, are retained – as much as possible – in Ireland. This strategy should be completed by the end of Q2 2022 and the Climate Action Plan should include supporting interim targets.

Phase 2 Criteria

The Climate Action Plan should include a target to have the proposed Maritime Area Regulatory Authority (MARA) operational by the end of Q1 2022. Delays in the establishment of MARA should not prevent Phase 2 projects from progressing.

Phase 2 projects should be identified by the end of Q3 2021. It is expected that any proposed criteria for Phase 2 projects will be decided upon in consultation with industry.

Floating Offshore Wind

The June 2020 Programme for Government, for the first time, sets out a commitment to a long-term vision for floating wind energy off Ireland's coast by setting an ambition of at least 30 GW. Floating Wind technology is rapidly evolving and it is estimated that cost reductions ((i.e. as low as €40 – €60 per MWh by 2030) will follow a similar trajectory to that of onshore wind and fixed bottom offshore wind.

The projects in the current development pipeline include plans for early floating offshore wind projects which are aiming for pre-2030 delivery and will be critical to realising the 5 GW by 2030.

Failure to progress these projects will have serious implications for attracting investment into floating offshore wind in Ireland. Therefore, the Government needs to set out a plan for how Floating Offshore Wind deployment will be progressed this decade to allow projects to energise by 2030, contributing to delivering our RES-E target, and providing the needed certainty to investors to ensure Ireland realises the ambition set out in the Programme for Government. Floating offshore wind will play an important part in Ireland's 2050 net-zero ambitions, and early commercial projects this decade will be crucial to developing the supply chain and ensuring the frameworks are in place for floating offshore wind to deliver at scale post-2030.

To facilitate the development of FLOW, urgent grid upgrades must be made along the south and west coasts. EirGrid must be instructed to carry out studies on the grid capacity of these areas as quickly as possible. Grid upgrades must also be future-proofed to enable 2050 targets. WEI is engaging with EirGrid though the *Shaping Our Electricity Future* consultation to improve understanding of the role of floating offshore wind for Ireland's future ambitions.

WEI recommends a floating wind pot in RESS or an "F-RESS" auction in 2025 to support early commercial scale projects for the Celtic Sea and Atlantic production zones. A roadmap for future RESS auctions post 2025 should also be put in place, particularly to support early commercial scale projects for the Celtic Sea and Atlantic production zones. The Climate Action Plan should include a specific target regarding the opportunity for the production of Green Electrofuels for the Irish and European market. This requires a national strategy on energy hubs and a route to market including green hydrogen and its derivatives.

Ireland needs an approach to seabed leasing / MAC allocation

A robust, transparent and efficient allocation of seabed is required to avoid future challenges for additional projects or Phase 2 projects. The MAP General Scheme provides for relevant Ministers to apply additional/amended sector specific considerations by way of regulations. This is important as the characteristics of the ORE industry in Ireland will need to be taken account of in developing a seabed allocation process. There are already a significant number of projects at various stages of development. An application driven approach may work for other forms of development, but we do not believe this to be the case for offshore wind.

An enduring MAC allocation process is critical to providing a level-playing field for developments and a suitable arrangement should be put in place as part of a public consultation process. There are a number of developers investigating, or with plans to investigate sites in Irish waters. To ensure developers with the strongest credentials and plans are allocated MACs, periodic and regular MAC application windows should be held.

A structured process or application window will need to be put in place to deal with applications and assess them in a robust and fair way (whether they are overlapping or not). Principles guiding this process should include predictability and it should be made clear to applicants:

- When applications will be assessed;
- How they will be assessed and
- What criteria they will be assessed under.

Qualitative criteria should be the key determining factors for the success of C-MAC applications - Ireland should avoid the 'highest bidder wins' format favoured in The Crown Estate Round 4 auctions as it is a blunt assessment. Such an approach risks putting upward pressure on RESS auction bids. Evidence in the US and more recently in the UK shows the potential for very high prices[14]. Option fees should be capped to minimise costs to the consumer. Sustainable competition is needed to deliver an industry, that does not impact consumers, and provides confidence to the supply chain and investors.

1. **Points-based system** - We recommend a points-based system be put in place based on the criteria outlined in the MAP Bill. Where there is no overlap between projects, developers should be required to reach a minimum number of points to be successful. Where there is overlap, the developer that scores the highest points would win.
2. **Assessment criteria** - We support the criteria identified in the MPDM Bill but believe additional parameters are needed which could be provided for by regulation – '*Relevant experience of the applicant'* and '*ability to deliver and contribute to renewables targets*'. We believe the first criteria should be captured and assessed to ensure that only skilled and experienced developers are allocated MACs. A key benefit of coming late to the offshore wind development is that Ireland is in the position to reap the rewards of years of development experience. It is also important to acknowledge that some criteria are more important than others. Strong weighting should be applied to this proposed criteria and the *technical competence of the applicant*. We believe '*ability to deliver and contribute to renewables targets'* should be included as a criterion to ensure that developers with credible plans to build out and contribute to 2030 targets are prioritised if there are competing applications.
3. **Rent and fees payable** – We recommend these be determined using a set formula and should not be used as a determining auction parameter. If it were to feature as an auction parameter amounts payable should be capped to avoid increased costs to developers and minimise cost to consumer. A one-off payment would be required upon award and annual rent. We recommend the one-off payment be based on the relationship between site area, capacity and density e.g. EUR/MW or EUR/Km^2 and that these are capped to avoid spiralling prices and cost to the consumer. Annual rent should be based on either an agreed pre-construction energy yield prediction or actual energy yield output and should commence once the project has been constructed.

[14] https://ore.catapult.org.uk/blog/miriam-noonans-thoughts-seabed-leasing-4/

3.3 WEI Response to Question 3: What role does renewable gas have in the power generation sector?

WEI has highlighted the potential role technologies such as green hydrogen can play in decarbonising the electricity sector in Section 3.1.1.4.3.1.1.4

In the near term, consideration should be given to requiring any new fossil generation capacity to be highly flexible (very low minimum generation and commercially able to accommodate regular on / off cycling) and to be hydrogen ready. This could be achieved through appropriate amendments to capacity auction terms and conditions.

While in the near-term hydrogen is likely to be an expensive fuel for this category of plant, in the medium-term fuel costs are likely to drop as electrolysers are deployed at greater scale, and the fuel cost would become less impactful as less is required on this very high RES-E system i.e. the opportunity may emerge to completely decarbonise the power system at modest costs if all new gas fired generation is hydrogen ready.

It is perhaps also noteworthy, that if hydrogen production facilities could be located behind wind generation network constraints, then this could also reduce the network congestion problem i.e. we would be using renewable electricity that might otherwise be constrained due to network limitations to produce hydrogen to support clean capacity provision.

There are challenges to this approach including the volume of hydrogen that might need to be stored and / or transported and associated costs but it is an area worthy of further exploration.

3.4 WEI Response to Question 4: What role could carbon, capture and storage have in decarbonising our power sector?

The analysis by Baringa Partners which is appended to our report demonstrates a pathway to a zero-carbon power system which does not require carbon, capture and storage.

It is generally considered that hydrogen powered generation is more suitable for flexible units than CCS, which will in general need to run for longer periods. On very high RES-E systems this requires all remaining conventional plant to be extremely flexible and will need to be viable running at very low-capacity factors. Inflexible generation may inadvertently create a situation where gas generation and CCS is displacing other renewable generation on the system. As noted above, one key enabler in maximising the deployment of renewables is reducing the amount of must run conventional generation on the system through the removal of existing operational constraints.

If we can reduce the requirement for this fuel to sufficiently low levels through increased deployment of renewable generation, full zero carbon system services, greater interconnection to neighbouring jurisdictions and potentially deployment of new and emerging long duration storage solutions, then a better option may be to source the remaining fuel required to fully decarbonise the power system from renewable gas such as hydrogen.

3.5 WEI Response to Question 5: What other opportunities exist to support the decarbonisation of the electricity sector?

Going forward, another reason for dispatch down, energy balancing, which refers to dispatch down of renewables where generation exceeds demand, will become more prevalent. Currently energy balancing levels are low compared with system curtailment and network constraints. Analysis is showing that by 2030 energy balancing will be the main reason for the dispatch down of new renewable generators. We believe this should be managed through the market design and enablement of further interconnection, the electrification of the heat and transport sectors and further decarbonisation technologies such as hydrogen and long-duration energy storage. Some of these technologies, such as interconnection, are already proven in enabling higher levels of RES-E on the Irish system. However, due to the change and growing nature of the challenge new technologies such as hydrogen need to be supported by the Government with dedicated R&D and delivery actions in the updated climate change action plan.

Clean Energy Package Implementation (CEP)

The full implementation of the CEP Articles 12 & 13 of the Electricity Regulation is currently not called out in the CAP, but this is an extremely important area for the continued growth of renewable energy. The CRU must develop a roadmap for implementation, including roll-out of the market interfaces to allow renewable generators to participate fully in the electricity market. We suggest an action in the Final CAP 2021 requiring the CRU, in co-operation with URIGNI via the SEMC, and the System Operators, to implement the Articles 12 & 13 in a manner that is compliant with the provisions of the regulation and one which supports delivery of CAP targets by 2030 at the least possible cost to consumers.

Dispatch Down Certainty in RESS Auctions

Once a generator becomes operational following a successful RESS auction, the developer of that generator has no control over the levels of constraint, curtailment, or energy balancing which the generator will absorb. Similarly, the developer has no ability to respond to varying locational signals driven by changes to TLAFs or TUoS as the decision regarding the location of the generator has already been made - with the locational signals at that point in time, such as TLAF and TUoS costs, having fed into this decision.

There is substantial difficulty in predicting each of the five volatile factors (constraint, curtailment, energy balancing, TLAF and TUoS) over a 35-year project lifetime. This creates a very wide-ranging band of uncertainty which the developer must take account of in advance of submitting a RESS auction bid. The continuation of this uncertainty and risk remaining with the developer will lead to inefficient outcomes in future RESS auctions, as the developer's estimate for each of these five factors for the full lifetime will be locked into consumer costs through the RESS auction bid price for 15 years, regardless of any subsequent improvements to reduce the volatility of these factors. In

addition, the high risk and uncertainty around these assumptions will likely result in a higher investment hurdle rate / required IRR to reward the end investor for taking this risk.

At the same time, incentives should be put in place for the parties best placed to manage the volatility of these factors to deliver the best outcome for the consumer. In this situation, the parties best placed to manage the risks are the System Operators and the Regulators as they are mandated to develop the electricity network and enhance operational practices to reduce dispatch down and they also set policy related to the locational signals (TLAFs and TUoS) for where future generators should locate.

This is also related to the implementation of Articles 12 & 13 regarding which party is best placed to manage the risk of dispatch down and who is best able to mitigate it through measures under their control. Therefore, there is merit to minimising or removing the risk and volatility associated with these factors to the RESS bidder. A greater level of certainty around these factors should be offered to developers in advance of the auction taking place.

WEI has developed a position paper[15] on this issue, which has been submitted to DECC. WEI believe that the updated CAP should include an action giving lead responsibility to DECC and involving the CRU, System Operators, and industry to review the operation of dispatch down on the electricity system with the goal of giving greater certainty to renewable generators.

Market Design for 2030 and beyond

The energy market was designed around the short-term marginal cost of production since it was originally conceived with fossil-fuelled power plants in mind, where marginal costs (i.e. the price of fuel) were typically the most significant expense driven by coal, gas and oil prices. This means that the price of commodities such as coal and gas have typically determined the price of electricity in Ireland and the Irish market is therefore exposed to volatility in the international prices for these commodities. These fossil fuel plants typically have lower capital costs relative to their marginal or operating costs, so they rely on the energy market for most of their revenue to cover costs.

However, wind energy is different in that it has relatively high capital costs but has no marginal costs (as there is no fuel or carbon cost) so when wind energy participates in the electricity market it effectively enters with a bid of zero, thus driving down the price of electricity on the market as it displaces more expensive forms of fossil fuel generation via the merit order effect.

So what happens when Ireland's power system can facilitate 100% wind energy at a single point in time? A market design based on the marginal cost of the generators participating in it is not fit for purpose in a world where 100% of the electricity is being produced by zero-marginal cost renewable electricity. It is likely to lead to a lot of negative pricing in the market and volatile price swings, which is unlikely to provide the revenue certainty required for investments to continue in either renewable or thermal generators.

[15] https://windenergyireland.com/images/files/wind-energy-ireland-submission-to-decc-on-reducing-ress-auction-bidding-risk.pdf

Renewable electricity will provide the majority of the energy in the market (i.e. 70%), but unlike today's market in Ireland where electricity prices for participants are set one day in advance, renewable electricity typically requires price certainty for 10-15 years in advance to be financeable due to its relatively high up front capital costs. So how can our energy market evolve to provide the price certainty required to stimulate more investment in renewable electricity?

The electricity sector will change rapidly over the next decade and so the electricity market needs to keep pace with these changes. The energy market is moving from one based predominantly on fossil fuel plants and recovering short-term marginal costs to one based on renewable electricity with little to no short-term marginal costs but with a need for longer-term price supports. Capacity markets will also become critical to ensure sufficient generation capacity is available as a backup for low wind/low solar days and new system services and technologies need to be incentivised to support a system with high levels of variable renewable electricity. At present, there is a clear consensus that change is coming, but very little consensus on what the market design of 2030 looks like in order to send the correct signals for the investments that are required to achieve our renewable ambitions.

Therefore, we recommend as an action in the final CAP 2021 that the market operator, SEMO via EirGrid, the CRU and DECC should put in place a dedicated team to solely focus on what the electricity market design should be in 2030 to facilitate a power system with at least 70% of demand being met by renewables.

3.6 WEI Response to Question 6: What measures might be taken to improve the resilience of the electricity system to the impacts of climate change?

In addition to the development of new low carbon technologies that we have noted above such as green hydrogen and long-duration storage that will provide system adequacy and support the system through extreme weather events, we believe developing grid infrastructure will also support system resilience and allow more efficient transmission of renewable energy to demand centres.

4 Carbon Pricing and Cross-Cutting Issues

4.1 WEI Response to Question 3: What further measures might be required in the planning system to realise the objectives of the National Planning Framework in respect of climate action?

4.1.1 Planning Decision Timelines

Planning difficulties in Ireland are slowing down the pace of renewable energy development and pose challenges to the national priority of reinforcing the transmission system. An effective planning system and a stronger transmission grid will together provide the foundation for a modern electricity system which will rely on renewable energy to power our homes, our economy and our society.

A typical wind energy project currently takes between 8 to 12 years to clear the consenting process and to be built. This can only be improved through reform and, more importantly, adequate resourcing. The delays are primarily around the timelines it takes an Bord Pleanála to make planning decisions and the fact that almost all wind farm decisions made at an Bord Pleanála level in the last 12 months have been subject to Judicial Review. Judicial reviews have also been taken against the granting of survey licences for offshore renewables.

Fixed timelines for planning decisions are required. In addition, a revised Judicial Review process is necessary whereby the merits and standing of any proposed Judicial Review and applicant are subject to scrutiny prior to leave being granted for a Judicial Review to be taken. The UK system for Judicial Review is an example of where proposed grounds for Judicial Review are scrutinised prior to leave being granted unlike in Ireland where any proposed Judicial Review is granted leave without first examining the merits of the proposed case. Our analysis on business-as-usual timelines for wind farm development in our Building Onshore Wind report clearly shows planning delays are one of the biggest barriers to decarbonising Ireland's electricity supply[16].

Wind Energy Ireland urges a series of changes to speed up the planning process and our priority recommendations include:

- Planning decisions need to be made faster, particularly timelines for appeals to An Bord Pleanála, which are currently 59 weeks instead of the Board's own 18 weeks statutory objective;
- Early engagement with SOs on grid connection nodes to provide certainty at the planning application stage.
- The proposed new Wind Energy Planning Guidelines need to be finalised based on rigorous scientific evidence and must strike the right balance between the need to develop new wind farms and the concerns of those opposed to renewable energy. It is vitally important that all technical errors and inconsistencies in the current draft Wind Energy Guidelines are corrected and that ambiguity around the limits proposed is cleared up.

[16] IWEA, (2020). 'Building Onshore Wind: 70 by 30 Implementation Plan' Link: https://iwea.com/images/files/iwea-building-onshore-wind-report-lr.pdf

- WEI suggests that ETSU guidance from the UK is the best way to move forward with the noise aspect of the Wind Energy Guidelines and that implementing this change can be done without the need for a further SEA on the WEGs.

- Include an action in the Climate Action Plan requiring the introduction by An Bord Pleanála of pre-planning consultation for Strategic Infrastructure Development (SID) applications and that the board must streamline the process for deciding on applications for SID status. These actions to be completed by the end of Q4 2021.
- "*Review and reform the JR process so that reforms come into effect upon the establishment of Environment and Planning Law Court while always adhering to the Aarhus Convention*" as set out in the Programme for Government. This should also include a further scrutiny of potential Judicial Review cases at the leave to appeal stage.

Our proposed solutions identify the most important areas of planning system that require reform. However, to achieve our suggested reforms, the issue of adequate resourcing must be tackled. The allocation of Government resources has always been a difficult issue. However, given the accelerated impacts of climate change and our increased EU targets, any Departmental strategy must make adequate staff and resources available to local authorities, An Bord Pleanála and to the prescribed bodies invited to comment on applications.

4.1.2 Planning Policy: Regional approach to the spatial planning of wind energy development

The spatial planning and identification of suitable areas for wind energy development has to-date been a function of Local Authorities, typically achieved through their County Development Plans or specific Renewable Energy Strategy documents.

The Department of Environment, Climate and Communications (DECC) is currently preparing a Renewable Electricity and Policy Development Framework (REPDF), for the guidance of An Bord Pleanála, planning authorities, other statutory authorities, the general public and persons seeking development consent in relation to large scale projects for the generation of renewable electricity on land. It is intended that REPDF will seek to broadly identify suitable areas in the State, where "large scale" renewable electricity projects can be developed in a sustainable manner ("large scale" is deemed to be projects with a capacity of 50MW of higher).

The adopted Regional Spatial and Economic Strategies (RSES) by the three Regional Assemblies, have some supportive policies and objectives relating to renewable energy, particularly around preparing regional renewable energy strategies, and identifying potential renewable energy sites across the individual regions.

It is unclear how the current and future policy frameworks for the spatial planning for wind energy development will be integrated, and how the various policy documents will be aligned and ordered in hierarchy.

Renewable energy developments and wind energy developments have attracted increased levels of opposition in recent years from local communities and national groupings. County-level opposition

to wind farms, often led by a small number of individuals who do not represent the views of the wider population, has resulted in many changes or proposed changes to local planning policies through revisions or variations to County Development Plans. Many such planning policy changes have required intervention by the Minister of Housing, Local Government and Heritage to bring local policy back into line with national policy.

The proposed REPDF and objectives of the RSES are very much welcomed and urgently required, but they must be aligned within a policy framework that clearly assigns responsibility for spatial planning for wind energy development at a national or regional level, rather than local (county) level. As outlined in Figure 4 the current approach is leading to major differences in landscape classification for wind energy along county boundaries.

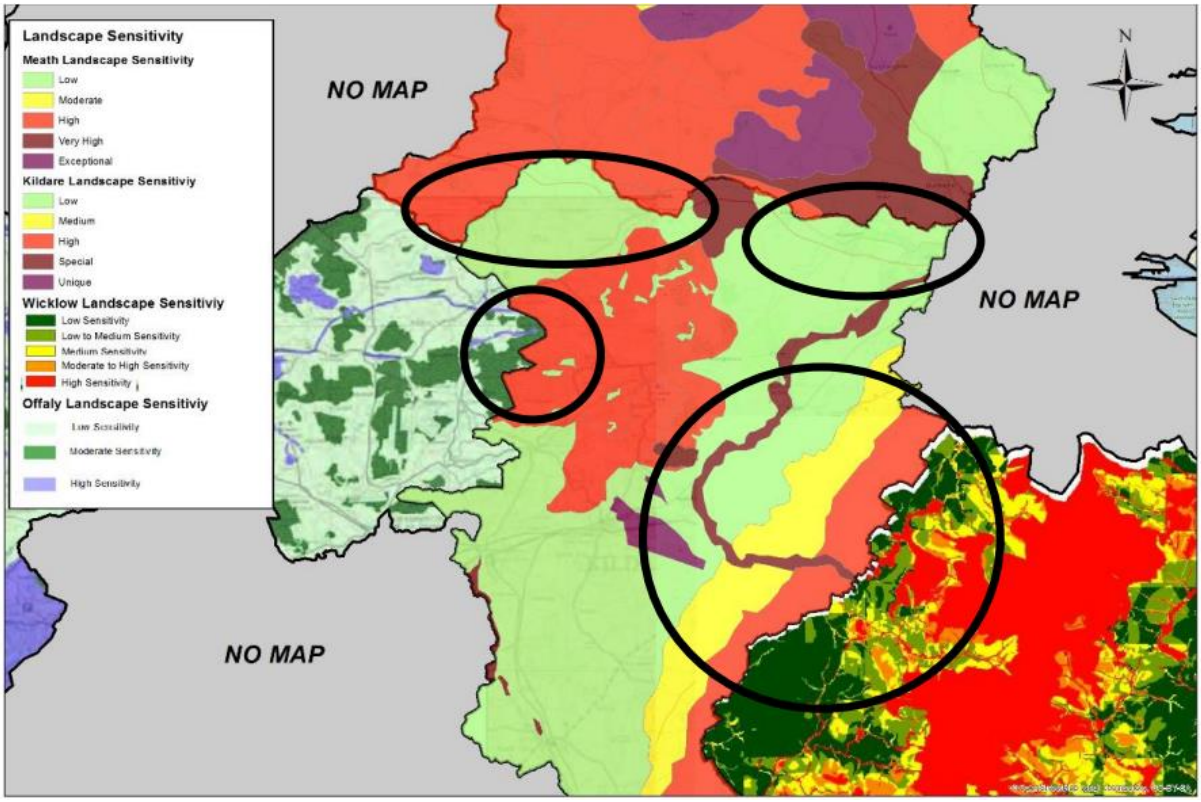


Figure 4: Landscape classification for wind energy across Meath, Kildare, Wicklow and Offaly which outlines the misalignment at county boundaries for wind energy at present, which a regional approach would overcome.

WEI believes it is now necessary to complete the REPDF that will set targets in GW for each region and to provide for the spatial planning of wind energy on a national and regional basis in the form of Regional Renewable Energy Strategies (RRES), rather than at the Local Authority level as has been the case to-date. In allocating regional GW targets REPDF should set minimum targets not maximum. This would create a more proactive approach to the regional targets. DECC and DHLGH must be provided with the capital expenditure and resources to deliver this.

Such a national and regional approach is considered vital if the transition to a low carbon economy in the coming years is to be successful. It is now time to plan for this transition, based on the 3

Regional Assembly areas, rather than the 31 Local Authority areas as has been the case to-date. The regional approach would undoubtedly provide a more appropriate platform for ensuring national policy can be transposed effectively to local level, and ensure a consistent approach is used across the entire country that reflects Government policy.

WEI recommends that actions be included in the Climate Action Plan to give effect to the following recommendations:

- We move from a local approach to the spatial planning of wind energy in Ireland to a regional approach, coordinated by the 3 Regional Assemblies.
- That the REPDF be completed as soon as possible and apply sufficient targets in GW for each region to account for project attrition.
    - Start with +4GW and apply x5 multiple to allow for project attrition.
    - Use high-level constraints to confirm sufficient quantum of land.
    - Allocate minimum GW targets to regions.
    - Set deadlines for preparation of RRES and allocate adequate funding.
- RRES should standardise the methodology for landscape classification for wind energy.

5 Just Transition

5.1 WEI Response to Question 3: What specific further measures should Government undertake in order to realise the benefit of the low carbon transition, including in relation to supporting the development of low carbon sectors of the economy, including employment in these sectors?

The table below gives an overview of the benefits that a target of 70 per cent renewable electricity would bring to the Irish economy if implemented in line with the 2019 CAP.

Firstly, it will reduce CO2 emissions in electricity generation by 66 per cent by 2030, from approximately 12 Mt per year to 4-5 Mt per year. This is mainly driven by the replacement of fossil fuels with clean electricity, which will save the Irish economy an additional €1 billion on imported fossil fuels each year by 2030.

Moving beyond 70% renewable electricity as proposed in the WEI response in Section 3.1 will deliver even further carbon emission savings and fossil fuel savings than those shown below.

Delivering the renewable generation infrastructure will require approximately €12 billion of investment and will create ~6,000 direct jobs in Ireland, which is estimated here to create an additional ~9,000 indirect jobs.

However, these is an opportunity to significantly increase this. Research completed last year by the Carbon Trust examining the potential for Ireland's offshore wind energy supply chain found that currently – at best – Irish firms would be able to attract only 22 per cent of the lifetime multi-billion-euro investment[17]. The report set out how this could quickly grow to 31-36 per cent and eventually as much as half of the estimated €17.9 billion of investment associated with a 3.5 GW target for offshore wind.

Critical to this will be identifying a port on the east coast to facilitate the construction of offshore wind farms, creating an enterprise zone around this port (which has proven effective in the UK) and simultaneously supporting training in the sector via the Skillnets or Future Jobs programmes.

[17] https://windenergyireland.com/images/files/final-harnessing-our-potential-report-may-2020.pdf

Metric to Achieve 70by30	Onshore Wind	Offshore Wind	Solar	Notes
Installed Capacity by end of 2020 (MW)	4,200 MW	25 MW	0 MW	Initial data for 2020 is promising to meet the 40% RES-E target for 2020[18]
Additional Capacity in 2030* (MW)	4,000 MW	3,500 MW	1,500 MW	Capacities identified in the Climate Action Plan (CAP)
Total Investment (Billion euro by 2030)	€5 Billion (very accurate)	€6-7 Billion (very accurate)	€500 Million (very accurate)	Based on typical investment costs[19]. Excludes investment in supporting technologies such as batteries and interconnectors.
Carbon Savings (Mt/year by 2030)	~3.5 Mt (very accurate)	~4 Mt (very accurate)	~0.5 Mt (very accurate)	CAP found that 70% RES-E will save 7-8 Mt/year out of a total ambition in the CAP of ~16 Mt[20]
Avoided Natural Gas Imports (Million euro per year by 2030)	~€500 Million (very accurate)	~€600 Million (very accurate)	~€75 Million (very accurate)	Assuming all natural gas for electricity generation is imported and a forecasted gas price of 63 p/therm in 2030
Additional Direct Jobs (for new capacity only)	2,000[21] (very accurate)	2,500 (very accurate)	1,500[22] (estimate)	Onshore & offshore numbers are based on bespoke research in these areas. Solar is an estimate based on international experiences.
Indirect Jobs (for new capacity only)	4,000[23] (accurate)	3,500 (estimate)[24]	1,500[22] (estimate)	Onshore wind numbers are based on a study from 2010, so it needs to be updated, but provides a guide. Offshore numbers assume the same rate as onshore and solar is an estimate based on international experiences.

[18] http://www.eirgrid.ie/newsroom/record-wind-levels-feb-20/index.xml
[19] https://ens.dk/sites/ens.dk/files/Statistik/technology_data_catalogue_for_el_and_dh_-_0009.pdf
[20] https://www.dccae.gov.ie/documents/Climate%20Action%20Plan%202019.pdf
[21] Based on economic research on the number of jobs created per MW of installed capacity contained in the Siemens 2014 report *An Enterprising Wind: An economic analysis of the job creation potential of the wind sector in Ireland*. The ratio of 0.5 jobs per MW installed is the **most conservative** of the predictions made.
[22] Assuming 1 job per MW based on Figure 11 here for both direct and indirect jobs: https://www.solarpowereurope.org/wp-content/uploads/2018/08/Solar-PV-Jobs-Value-Added-in-Europe-November-2017.pdf
[23] Based on a study from 2010 which concluded that Ireland creates 1.5 jobs per MW in total in Ireland from wind energy, so assumed here that 0.5 per MW are direct and 1 per MW are indirect: https://www.iwea.com/images/files/9660bd5e72bcac538f47d1b02cc6658c97d41f.pdf
[24] Assuming the same indirect benefits as for onshore wind

5.2 WEI Response to Question 4: What specific investments should be considered to support a just transition in Ireland?

5.2.1 Port Investments and Offshore Supply Chain

Offshore wind energy could create 2,500 jobs in development and construction over the next ten years and attract over €42 billion in lifetime investment[25]. However, unless strategic investment decisions are made now, Ireland's offshore wind farms are likely to be built from bases outside the country, losing billions of this potential investment.

Unless investment is provided – either from the Government or the private sector – not a single Irish port will be capable of servicing the requirements to install an offshore wind farm and developers will choose Belfast or ports on the English or Welsh coasts. Currently Ireland has neither the infrastructure nor the resource capacity to capture the benefits of the coming energy revolution through the delivery of offshore wind at scale.

Both the installation (construction) and operation & maintenance (O&M) phases will require different services from ports. Storing and assembling the wind farm components at a port for delivery to the site is the common approach in the offshore wind sector. During the O&M phase, ports are used to service the windfarm allowing technicians to monitor the plant and when necessary, transport to the site via vessel or helicopter to carry out maintenance work.

As part of the previously mentioned study by the Carbon Trust, a detailed technical assessment of port infrastructure was carried out. All Irish ports assessed show technical capability for the operation and maintenance phase of the current development pipeline which would open a commercial opportunity of €350m over the lifetime for 3.5 GW installed pre-2030 and €880m over the lifetime for 8.8 GW installed post 2030. Furthermore, from a construction point of view there are a number of ports well placed for the provision of 'staging' given the availability of land area already at the port/harbour. However, significant improvements would still be required at the majority of the ports in terms of handling equipment, port depth, approach channel depths, quay length, quay loadbearing capacity and seabed suitability all of which would require significant up front capital investment in the region of approximately €30-€250 million within chosen ports. The figure below outlines the commercial opportunity for Irish ports.

[25] https://windenergyireland.com/images/files/final-harnessing-our-potential-report-may-2020.pdf

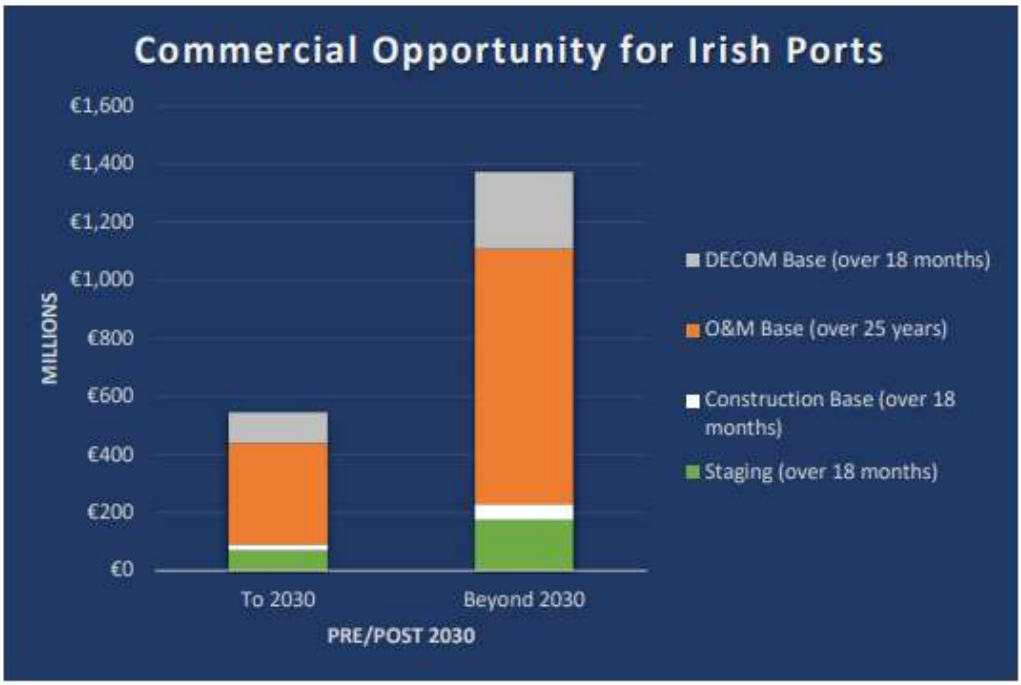


Figure 5: Commercial opportunity for Irish ports

Even where Irish ports do develop capability, market competition from UK ports will still exist. However, this would also be the case for Irish ports competing for opportunity in the UK market where significantly more capacity is targeted by 2030. The exit of the United Kingdom from the European Union will impact the commercial case for ports in the event no agreement can be reached to facilitate cross border trade. This may provide a strategic advantage for UK projects to be served by Irish ports given the likelihood that major wind farm components will be manufactured in Europe. The complexities of such permutations will need to be monitored and factored into any strategic and commercial decision made by an Irish port.

The Programme for Government also for the first time outlined an ambition for 30 GW of floating offshore wind energy in our deeper waters. Arguably the greatest challenge to unlocking the opportunity of floating wind in Ireland is misperception about the state of readiness of the sector. Technology improvements have enabled the rapid maturing of the floating wind market which is leading to associated cost reductions.

There is no time to waste if Ireland is to reach its ambitious targets for floating offshore wind and achieving carbon neutrality by 2050. To fully capture the benefits of floating offshore wind, it is important that Ireland looks to become an early mover in the space and establish a strong indigenous industry. With interest in the sector growing worldwide, the window to becoming an early mover is closing quickly. Wind Energy Ireland believes that investment in the capacity and infrastructure for floating offshore wind is key if Ireland is to take advantage of this first mover advantage.

Offshore wind at scale requires coordination of multiple stakeholders across a range of complex processes and components across the different stages of the project life cycle. As the industry evolves further and faster toward larger turbines and into more challenging environments (e.g. deeper waters), requirements for delivery are becoming even more specialised across infrastructure, suppliers and skills. Port infrastructure and services required by the floating offshore wind sector span a range of activities that occur at a number of scales depending on the stage of project development. These range from: - i). large, strategic ports designated as manufacturing hubs (such as Green Port, Hull, UK); ii). ports for assembly and installation; iii) small ports and harbours for operations and maintenance. Floating offshore wind development requires ports with the right mix of water depths, quayside bearing capacity, landbanks, cranage, vessels, berthage, and transport links. Only a few European seaports are currently suitable for floating wind manufacturing, assembly, and servicing. The logistics around the assembly and deployment of this volume of components coming in by sea will require investment in multiple port infrastructure on the south and west coasts.

Ireland already has multiple ports that have shown an interest in offshore wind or FLOW in particular. Redevelopment of these ports can transform small towns in the locality. Recent announcements have earmarked ports such as Rosslare and Shannon Foynes for offshore wind development[26]. The Cork Harbour: Ready to Float by 2025[27] document outlines recent and future plans for investment in the supply chain in Cork Harbour, including the development of the former Cork Dockyard as an assembly and installation hub. Other west coast ports that are well placed and preparing themselves for a role in floating offshore wind include Galway Port, Ros a Mhil and Killybegs.

Multiple ports will be needed in Ireland to service the requirements of the FLOW industry, whether they be for manufacturing, assembly and installation or maintenance. It will not be a case of choosing one port to service the needs of the industry, and a network will need to be developed. This has been seen in the UK and Europe.

Wind Energy Ireland would like to highlight that current port policy is out of date and does not provide for the supporting of offshore renewable energy development as a legitimate business growth area for our ports and surrounding areas. The scale of what we are being asked to accomplish is unlike anything ever done in Ireland before. Building 5 GW of offshore wind energy in ten years – creating an entirely new industry from next to nothing – requires urgent, rapid and coordinated policy development. This should include a change in port policy to facilitate investment in offshore renewable energy facilities at our ports.

The Climate Action Plan should include a recommendation requiring a review of ports policy to facilitate investment in offshore renewable energy.

[26] GDG (2020). Shannon Foynes reference
[27] Cork Harbour Supply Chain Group (2021). Cork Harbour: Ready to Float 2025.

5.2.2 Offshore Wind Enterprise Hubs

Alongside investing within the port side physical infrastructure at ports to build our future offshore projects out of, *Harnessing our potential* also recommended that consideration be given to develop offshore wind enterprise hubs adjacent to ports servicing offshore wind. This is similar to the enterprise zone model used within the UK that has proven successful for clustering of relevant companies and the growth of the offshore wind industry and associated supply chain.

On foot of this recommendation, Wind Energy Ireland commissioned BVG Associates to carry out a feasibility study for offshore wind enterprise hubs at Irish ports[28]. The report concluded that an Offshore Wind Enterprise Hub (EH) could create an **additional** 345 jobs in a port area bringing an **extra** €8.5 million GVA into the Irish economy over a five-year period in a 5 GW market with several of our east and west coast ports having the potential to host an enterprise hub. This could increase the number of market driven and locally induced jobs in a port by approximately 35% in addition to the expected project specific roles related to construction and O&M.

The Department of Trade, Enterprise and Employment should instigate a process now to designate EHs so that the first is in place by 2023 to influence the way the supply chain is established. It should be noted that a number of our ports are looking at how they might progress enterprise hubs at their facilities.

A set of typical criteria, inspired by the successful use of Enterprise Hubs in Britain, could include:

- A Port's appetite for offshore wind;
- Available space, offices, small enterprise units, larger units and existing infrastructure or area to develop these;
- Existing incubation for small enterprise and spin-offs for third level education and apprenticeships;
- Proximity and/or links to third level institutions with good innovation records;
- Proximity to Irish offshore wind farms expected to reach FID in 2023 and 2024;
- Good transport links; and
- Within an area of enhanced state aid or potential for freeport status.

[28] https://www.windenergyireland.com/images/files/bvga-32901enterprise-hub-feasibility-reportfinal.pdf

Table 1: Potential and recommendations for offshore wind enterprise hubs in Ireland[29]

Name	Description	Enterprise Hubs potential and recommendations	Stakeholders	Impact
1. Enterprise Hub scope	Any port designated as an Enterprise Hub should incorporate O&M activities.	Construction activities have a limited lifetime while O&M provides a more stable environment for innovation as it lasts for over 25 years and activities are tied to an asset which drives innovation.	An Bord Pleanaia, DECC, local authorities, port owners, SMEs, spin offs, wind farm developers and rest of supply chain.	At least 25 years of innovation
2. Potential for clustering	An Enterprise Hub located in a port area can help develop an offshore wind enterprise cluster.	Enterprise Hubs have the potential to encourage businesses to establish a base in a designated area. It would take more Government resources to establish a freezone but should one arise, it should contain an Enterprise Hub.	An Bord Pleanaia, DECC, local authorities, port owners, SMEs, spin offs, wind farm developers and rest of supply chain.	Makes a port more attractive for any investment
3. Location	Several east and west coast ports have the potential to host an Enterprise Hub in Ireland.	The first designated Enterprise Hub port should be located on the east coast. Designation of Enterprise Hubs ports on the west coast should come later to support floating offshore wind.	An Bord Pleanaia, DECC, local authorities, port owners, SMEs, spin offs, wind farm developers and rest of supply chain.	Enterprise Hub(s) will be ready for forthcoming commercial projects.
4. Job growth	An Enterprise Hub can increase the number of jobs in offshore wind.	It is estimated that an Enterprise Hubs could increase the number of jobs in a port area by approximately 35%.	DETE, DPER, Local Enterprise Office, port owners, Enterprise Ireland, SMEs, spin offs, tax payers, local communities.	Up to 345 jobs could be created by an Enterprise Hub in a port, while a conservative estimate reveals that 173 jobs could be created.
5. Economic benefit	An Enterprise Hub can provide economic benefits.	An Enterprise Hubs could result in economical benefit to the Irish Government in terms of GVA. It is estimated that the benefit is greater in the higher capacity scenario by approximately €3m GVA over a five year period.	DETE, DPER, Local Enterprise Office, Enterprise Ireland.	The benefit from low and high capacity scenarios with an Enterprise Hub were estimated to be €7m and €8.5m respectively.
6. Primary action	A process is required for designation of Enterprise Hubs.	The Irish Government should instigate a process to designate Enterprise Hubs so they are in place to influence the way the supply chain is established.	DECC, DETE, An Bord Pleanaia, IDA, port owners, SMEs, spin offs.	Improved synergies and collaboration throughout the supply chain
7. Additional incentives	Offer additional incentives to businesses in an an Enterprise Hub.	The Irish Government should assess the existing incentives on offer already for enterprise and decide what additional benefits such as reduced commercial rates to offer in Enterprise Hubs.	DPER, Local Enterprise Office, Enterprise Ireland, IDA	Increased uptake and locating of businesses in an Enterprise hub.
8. Outreach	Some ports intend to explore opportunities in nearby markets such as the UK.	It is recommended the ambition of ports to serve external markets is considered as a key criterion for Enterprise Hubs designation.	DETE, DEPR, IDA	Maximises the opportunity for ports and businesses located within a respective Enterprise Hub
9. Scale	The scale and ambition of Enterprise Hubs should be considered carefully.	Similar models in the UK such as the Humber Enterprise Zone although successful, are yet to reach desired levels of activity.	DETE, DEPR, IDA	Ensures port areas are utilised effectively, avoiding vacant land for prolonged periods.

5.3 WEI Response to Question 7: Are there specific issues for consideration in Ireland's further education, training, and skills system?

Future Jobs Ireland 2019 states that to meet Ireland's climate goals a step change of decarbonising our economy is required over the next decade. It will require entire sectors of the economy to undergo radical changes and create new types of enterprises and jobs. Furthermore, the report also includes the Action Plan for Rural Development and has identified significant potential in sectors such as agriculture, food, forestry, tourism and renewable energy sectors which are important local employers. The plan also encourages the diversification of rural economies to build resilience, create additional jobs in rural areas, and to maximise the opportunity to link employment to emerging issues such as climate change and managing sustainable land use.

Meeting our decarbonisation ambitions will need investment in and development of new skills and employment initiatives to drive Ireland's competitiveness, enterprise and innovation.

More recently the European Green Deal[30] has set out an action plan for moving to a clean, circular and climate resilient economy by 2050. Wind energy will be a key instrument in Europe delivering the Green Deal and sustainably growing the green economy and green recovery in the aftermath of

[29] https://www.windenergyireland.com/images/files/bvga-32901enterprise-hub-feasibility-reportfinal.pdf
[30] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1596443911913&uri=CELEX:52019DC0640#document2

the Covid-19 pandemic. The EU Recovery Plan aims to rapidly accelerate relatively new technologies such as the offshore wind sector in Europe. Through its plans and investment via grants and loans, aimed at recovering from Covid-19, the plan aims to modernise the EU economy and transition from fossil fuels in a just manner. The development of skills around this transition will be critical to its success.

This is reflected within Ireland's recovery plans also. The Irish Government has placed a jobs-led recovery at the centre of its Programme for Government and investment and the aim is to create 200,000 new jobs by 2025 as well as helping people currently unemployed due to COVID-19 back to work. The aim is to build a stronger, fairer and more sustainable economy prepared for the next phase of disruptive technologies on a pathway to a low-carbon future and create an economic opportunity through climate action. The Government have established a Recovery Fund focussed on infrastructure development, reskilling and training and supporting of investment and Wind Energy Ireland believes that wind energy and renewable energy more broadly should be considered central to Ireland's recovery plans.

The Carbon Trust report 'Harnessing our Potential' highlights the potential for approximately 2,500 direct jobs in Ireland to be created during the development & construction of 3.5 GW of offshore wind with the majority of these jobs created between 2025 – 2030. A further 700 jobs over the operational lifetime of these wind farms and 1,300 jobs during the decommissioning stage of these projects between 2050 – 2055 is also envisaged.[31] However, the level of Irish and locally based jobs will be dependent on the availability of the required people and skills in Ireland. The report identifies skill shortages within a number of areas in the potential Irish offshore wind supply chain but none more so than within engineering, financial services and logistics & operations. There will be a need for investment to train the required number of people and develop the necessary skills to maximise the level of employment created in Ireland from the developing offshore wind sector.

The ambition being shown across Government with regard climate action and associated skills development in recent years is welcomed by Wind Energy Ireland. However, implementation is now the challenge and key investment decisions and design of initiatives across growth areas are required urgently.

Skillnet Ireland is an excellent example of a successful initiative with support from Government and industry. Skillnet Ireland is a business support agency of the Government of Ireland with a mandate to advance the competitiveness, productivity, and innovation of Irish businesses through enterprise-led workforce development and in preparation for the future world of work. Supporting climate action and the energy transition are central to Skillnet Ireland's growth in the coming years and Wind Energy Ireland are the contracting organisation for one of Skillnet Ireland's training networks, Green Tech Skillnet. Wind Energy Ireland members have successfully completed impactful and relevant upskilling and training over the past decade through our network and this has been a key element in the success, competitiveness, and growth of the wind industry throughout this period. We believe the continued support and growth of the Green Tech Skillnet through Skillnet Ireland and through the support of our members should be considered a priority by Government as we look to prepare

[31] https://windenergyireland.com/images/files/final-harnessing-our-potential-report-may-2020.pdf

and upskill Ireland's workforce for the future world of work through the greening our economy. In this regard, Wind Energy Ireland would support the strategic themes of workforce design, people development and strategic innovation alongside of the associated enabling plans set out in Skillnet Ireland's Statement of Strategy 2021-2025[32].

[32] https://www.skillnetireland.ie/wp-content/uploads/2020/11/Skillnet-Ireland-Strategy-2021-2025.pdf

6 Conclusion

Wind Energy Ireland would again like to thank the Department of the Environment, Climate and Communications for the opportunity to provide a submission on the *Call for Expert Evidence - Climate Action Plan 2021.*

We hope you take into account the recommendations made within our submission and in particular our evidence relating to Baringa's 'Pathway to a zero-carbon power system in Ireland' study which is submitted as an accompanying appendix to this response.

The analysis shows that the emissions footprint of the electricity sector in Ireland can be reduced substantially beyond the 4 - 5 Mt of CO_2 objective of the Climate Action Plan 2019 by 2030, and it concludes that:

1. Government should **maintain the Climate Action Plan 2019 and Programme for Government renewable capacity targets** for onshore wind (8.2 GW) and offshore wind (5GW) for 2030, along with 5 GW of solar PV.

2. The Climate Action Plan 2021 should set a 2030 **power sector emissions target of less than 2 million tonnes of CO_2** which:
   - Is very achievable by 2030;
   - Does not require a significant change in the approach currently underway for to achieve 70% renewable electricity;
   - Can be met by implementing more of existing technologies that are proven today; and
   - Can be achieved at a lower cost to the end consumer (saving approx. €150m per annum).

3. A **stretch target of a zero-carbon power system by 2030 is possible though**:
   - It requires incremental investments in a suite of new technologies; and
   - It requires the introduction of a carbon price floor in I-SEM.

We strongly endorse these positions and recommend that the Government considers implementing these positions in the Climate Action Plan 2021.

Furthermore, we hope you take account of our positions in relation to the electricity grid, and market. We are calling for a complete redesign and reinforcement of the transmission system to deliver the renewable generation capacities outlined in the Programme for Government. Last year more than 10% of renewable generation was lost because the grid could not accommodate it. As things stand, capacity on the transmission system is likely to be the single most significant challenge Ireland faces in achieving future climate action goals.

In addition, we wish to highlight the position that we must transition away from Ireland's fossil fuel back-up generation and replace them with zero-carbon solutions like energy storage and demand response to enable an electricity system capable of operating with 100% of demand being met by

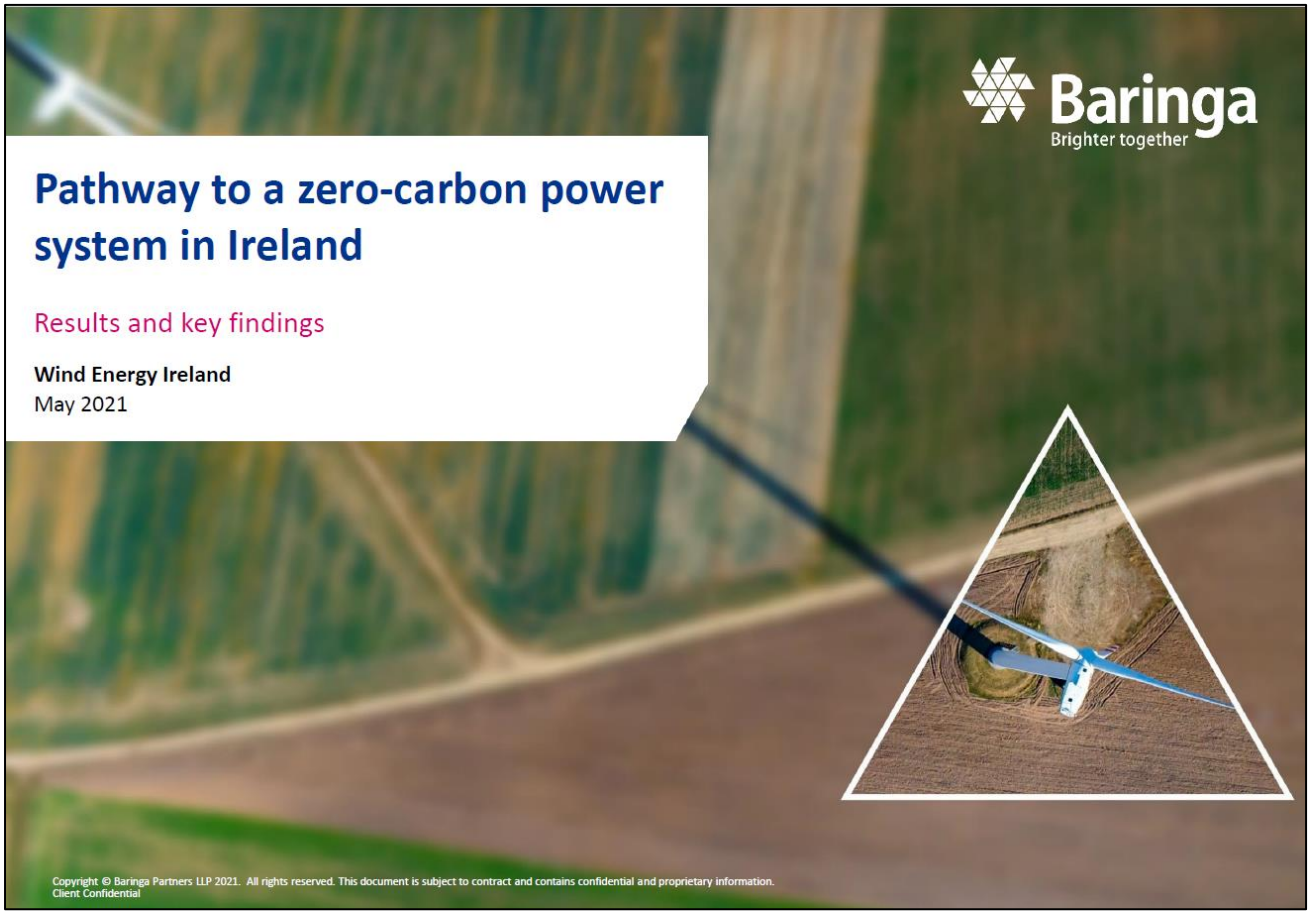
renewables at any point in time. The electricity market must also be reformed to ensure that investments in renewable generation and new technologies are supported over the longer term.

Finally, we recommend that the policy improvements set out in Appendix 3, and described within this response, should be incorporated into the Climate Action Plan 2021 to put us on a path to fully decarbonising the electricity sector as soon as possible.

If implemented, we can built a net-zero society in Ireland by 2050, one that is energy dependent, with warmer homes, cleaner air and tens of thousands of new jobs generated by a truly just transition.

7 Appendix 1 – Baringa Pathway to a Zero-Carbon Power System Study

Included as an attachment to this submission.



8 Appendix 2 – Our Climate Neutral Future – Zero by 50

Included as an attachment to this submission.

The report can also be found online here: https://windenergyireland.com/images/files/our-climate-neutral-future-0by50-final-report.pdf.

9 Appendix 3 – 70by30 Implementation Plan Action Tables

9.1 Saving Power

The report can be found here: https://windenergyireland.com/images/files/iwea-saving-power-report.pdf

Policy Improvements to Minimise Curtailment				
Policy Improvement	**Description**	**Aim**	**Lead Stakeholders**	**Target Date**
DS3+	Enhance the DS3 programme to facilitate 2030 RES-E objectives	Develop a DS3+ programme roadmap to relieve existing operational constraints in line with EirGrid's strategic objectives to run the system with up to 100% non-synchronous generation and the complete removal of operational constraints such as Minimum Generation Levels.	EirGrid, CRU, ESBN	Q4 2021
Interconnection Capacity	Provide additional interconnection capacity i.e. deliver Celtic and Greenlink interconnectors and put in place an enduring interconnection policy regime. Ensure framework is in place to enable the development of further interconnectors.	Deliver Greenlink Interconnector by 2023 and Celtic Interconnector by 2026 Develop an enduring interconnection policy regime by Q4 2020. Additional interconnectors are in development by 2025	CRU, EirGrid, Greenlink Developer	Develop enduring interconnection regime - 2021 Greenlink – 2023 Celtic – 2026

Interconnection Operation	Introduce Single Intraday Coupling (SIDC) and maximise countertrading as an interim measure to ensure that the market design is incentivising the right behaviour on the interconnectors on a first principles basis (least cost / least emissions).	Enhance interconnector operation so that they able to export approximately 90% of their capacity during curtailment events	EirGrid, SEMO, CRU	Post Brexit Trading Arrangement - 2022 Intro SIDC - 2023

Policy Improvements to Minimise Constraints				
Policy Improvement	**Description**	**Aim**	**Lead Stakeholders**	**Target Date**
Increase Transmission Grid Capacity for Existing & New Circuits	Progress grid reinforcements based on future renewable development pipeline along with alternative network solutions using best-in-class community engagement. Streamline EirGrid's 'six-step' process. This includes earlier decision on underground solutions, when technically viable. and create a Grid Capacity Advisory Council. Maximise the capacity of the existing grid via alternative network solutions such as Smart Wires, energy storage, demand side response	Minimise constraints to the greatest extent possible and, where appropriate and reasonable, provide an indicative solution and timeline so renewable electricity generations can continue to develop with the certainty that constraints will be minimised in future. As an outcome from the current EirGrid Shaping our Electricity Future Consultation, establish a grid development roadmap that would enable the deployment of the installed capacity targets in the program for Government	EirGrid, ESBN, CRU	2021: Identify grid development requirements; Establish Grid Capacity Advisory Council; Initiate design & consent of required grid reinforcements. Develop PR5 grid development programme of work.

Major Long-Term Changes to Consider				
Policy Improvement	**Description**	**Aim**	**Lead Stakeholders**	**Target Date**
Market Redesign	Today's electricity market is designed around marginal-cost energy, backup capacity and small amount of system services. In the future, renewable electricity will need long-term energy contracts, power plants will likely rely on capacity contracts and the grid will need much more system services. There is consensus change is coming, but analysis is required to establish exactly what this is.	The market operator, SEMO via EirGrid and the CRU should put in place a dedicated team to solely focus on what the electricity market design should be in 2030 to facilitate a close to zero-carbon power system. Ireland should also seek to engage and lead at a European level in the design of future markets appropriate for very high RES-E levels.	CRU, SEMO, EirGrid	2021
Dispatch down Certainty	CRU should implement dispatch down compensation for variable renewable generators, which is paid for by EirGrid and ESBN, who can then justify investments in solutions to reduce this compensation and thus reduce dispatch down. The compensation mechanism will need to ensure that generators are also not incentivised to build capacity in unwanted locations.	This could be implemented in the short-term while transposing Article 12 and 13 of the Electricity Regulation in the Clean Energy Package. If not, then CRU should establish a roadmap that will explain how dispatch down will be managed over the next decade at the lower cost to the consumer, while also incentivising investment in renewable electricity to achieve 70by30. At present without dispatch down compensation, it is very likely that the 2030 targets will not be met or alternatively, they will be met at unnecessarily high costs to the consumer.	SEMO, CRU, EirGrid, ESBN	2020/2021

Grid 2050	The power system will be very different in 2050 so whatever path we take towards 2030 should bring us on the journey to full decarbonisation of the economy before 2050. This will ensure we can 1) use wind energy for renewable heat and transport and 2) minimise dispatch down due to Energy Balancing.	EirGrid and ESB Networks should begin planning for the power system needs for a fully decarbonised electricity system which can support the electrification of heat and transport with the goal of a decarbonised economy by 2050.	EirGrid, ESBN, CRU	2021

9.2 Building Onshore Wind

The report can be found here: https://windenergyireland.com/images/files/iwea-building-onshore-wind-report-lr.pdf

Policy Improvement (PI)	Description	Aim	Lead	Supporting Role	Next Step	Target Date
1. Pre-Planning Success	Higher Pre-Planning Success via enhanced Community Engagement & Regional Planning (REPDF).	Halve the pre-planning attrition rate from 33% in BaU to 15%.	DHPLG	Regional assemblies, DCCAE	Appoint consultants to prepare the Regional Renewable Energy Strategies on behalf of the three Regional assemblies, and the associated Strategic Environmental Assessments (SEA) and Habitats Directive Assessments (HDA). DHPLG to brief and instruct Regional assemblies on urgency of proceeding with Regional Renewable Energy Strategies, and outline proposed approach for preparation, funding, etc.	2021, 2022

2. SID Success	Higher SID Success via improved planning applications and more extensive ABP-industry engagement.	Double the current SID success rate from 38% in BaU to 75%.	DHPLG	ABP	DHPLG legislates for the suggested new SID pre-application stage in a revision to the Planning and Development Act. To begin, DHPLG seeks formal or informal input from An Bord Pleanála and industry stakeholders on need for change to SID process.	2021
3. ABP Decision Timelines	ABP Decision Timelines via mandatory decision timelines similar to SHD.	Improve ABP decision timelines by reducing them to 18 weeks for all decisions. Current decision timelines in ABP are 66 weeks for Local Authority Appeal, 89 weeks for JR referrals and 32 weeks for SID decisions.	DHPLG	ABP, OPR	DHPLG legislates for the suggested new ABP decision timeframes in a revision to the Planning and Development Act for SID decisions, JR referrals and appeals. To begin, DHPLG should seek formal or informal input from An Bord Pleanála and/or industry stakeholders on how to change the SID decisions, JR referrals and appeals processes/timelines.	2021
4. Grid Offers	SOs offer sufficient grid offers to meet targets & have sufficient competition via grid offer regulations e.g. Prioritise Large Projects in ECP or implement Grid Following Funding (GFF).	SOs move from 'order of planning grant' for grid offers to processing minimum of 50 offers per year, prioritising first 25 for largest, or move to Grid Following Funding model.	CRU	EirGrid, ESBN	CRU to design and decide on the enduring connection policy framework, including the treatment of firm/non-firm access, and on the allowed PR5 spend for the SOs. EirGrid and ESBN will process the connection offers as per the ECP framework.	2020
5. Transmission Grid Capacity	Parallel Transmission Development via PR5 and resourcing	- Increase from 27% to 70% proportion of projects which face no transmission system delay - Reduce from 48% to 20% proportion of	EirGrid, ESBN	CRU, ABP	EirGrid to design and consent the appropriate network reinforcement and ESBN to carry out necessary construction and energisation works. CRU to determine the allowed spend on network reinforcement projects.	2020

		projects which face a 2-year delay - Reduce from 24% to 10% proportion of projects which face a 4-year delay or longer				
6. Grid Consenting	a) Parallel Grid Consenting via PR5; b) resourcing and early engagement with SOs on connection methods via a new Project Development Support and Tracking office.	Increase parallel grid consenting from 30% of projects to 80% and obtain early engagement with SOs.	a)DHPLG, DTTAS, CRU; b)EirGrid, ESBN	a)EirGrid, ESBN; b)CRU	a) DHPLG to update the Planning and Development Regulations. DTTS to make necessary amendments to the Roads Act; b) SOs to create a new Project Development Support and Tracking Office.	2020
7. Grid Offer Longstop Dates	ECP Long-Stop enables entry to three RESS auctions via grid offer regulations or RESS entry requirements or a Grid Following Funding (GFF) model.	Grid offers allow projects to enter three annual RESS auctions rather than one.	CRU	DCCAE	CRU to design and decide on ECP framework.	2020
8. Grid Delivery	Strict Grid Delivery Timelines via PR5 and penalties for late delivery.	Reduce finance and build period from 2.5 years to 1.5 years.	ESBN, EirGrid	CRU	ESBN and EirGrid, as parties to the Infrastructure Agreement, to develop connection design specifications and grid delivery programmes.	2020
9. Route to Market via RESS/CPPAs	Annual route to market for 66% of projects via a) RESS or b) Corporate PPAs (CPPAs)	BaU case assumed 66% of projects found route to market each year. Impact quantified by removing this and assuming onshore wind is excluded beyond RESS-1 and CPPA market is	DCCAE, SEAI, DoF, DPER	DHPLG, CRU, EirGrid, ESBN, Large Energy Users, IDA, ESRI	RESS: First auction to be completed in July 2020 with annual auctions for onshore wind to follow thereafter. Update RESS timeline and volumes to reflect this. CPPAs: New policy to pass some of the savings due to CPPAs to corporates who sign CPPAs. Both: Task force to be	2020/21

		limited to 100 MW per year.			set up with a focus on reducing the cost of renewable electricity in Ireland.	

9.3 Building Offshore Wind

The report can be found here: https://windenergyireland.com/images/files/20201203-final-iwea-building-offshore-wind-report.pdf

Policy Improvement (PI)	Brief Description of What's Needed	Lead	Supporting Role	Next Step	Target Date (as per Building Offshore Wind)
PI1: Obtain Foreshore Licences by Q4 2021	A planning application typically requires at least two years of environmental surveys, but these can only be completed once a project has a foreshore licence, so any project that has to be delivered before 2030 must have a licence by 2021.	DHLGH	DECC, DPER	Ensure sufficient resources are available to issue foreshore licences for all projects that can deliver pre-2030.	Q4 2021
PI2: Complete National Marine Planning Framework by Q4 2020	The National Marine Planning Framework should be finalised and in place by Q4 2020 so projects can apply for consent through the MPDM in 2021.	DHLGH	DECC	Conclude National Marine Planning Framework consultation by updating based on feedback received.	Q4 2020

PI3: Enact MPDM Bill by Q1 2021	The MPDM and all secondary legislation must be enacted by Q1 2021 to allow Phase 1 Projects to progress and additional projects to enter the consent process.	DHLGH	DECC	Progress the MPDM Bill through the Oireachtas. Advance Secondary Legislation, Offshore Guidelines and associated Maritime Jurisdiction Bill.	Q4 2021
PI4: ABP Planning	An Bord Pleanála must be sufficiently resourced to process the significant number of projects that will apply for planning consent over the next number of years in a timely manner.	ABP, DHLGH	DPER	ABP needs marine expertise at Board, staff and Marine Advisory Committee levels & need to begin engaging with offshore projects. ABP should have statutory timelines for planning decisions.	**Q4 2020**
PI5: Grid Offers & Consenting	A decentralised, developer-led grid delivery model involving early engagement with An Bord Pleanála and EirGrid must be put in place to facilitate parallel wind farm and grid consenting. Phase 1 & 2 Projects need clarity on how their offers will be progressed.	Decentralise Grid: DECC Offers: CRU/ EirGrid	ABP	DECC to use a developer-led Option 1/2 Offshore Grid Delivery Model. CRU to put in place grid offer process for Phase 1 & 2 Projects. EirGrid to process offers.	**Q4 2020**
PI6: Grid Delivery	Sufficient resourcing must be in place in EirGrid and ESBN so that non-contestable grid delivery does not delay projects from commissioning. Appropriate cable functional specifications are also vital.	CRU, EirGrid	ESBN, EirGrid	Following positive PR5 outcome, EirGrid and ESBN to recruit sufficient resources and expertise to support Offshore Programme delivery.	Q1 2021

PI7: RESS	An efficient RESS scheme must be put in place for offshore wind to maximise the capacity that can be achieved by 2030.	DECC	CRU, EirGrid	First Offshore RESS (O-RESS) initiated in 2021 with sufficient volumes auctioned across three auctions by 2025 to meet the 2030 targets and drive value to the consumer.	Q4 2021