

Offshore Renewable Energy Strategy Submission

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Executive Summary

The European Commission estimates that between 240 and 450 GW of offshore wind power will be needed by 2050 to help keep temperature rises below 1.5°C, deliver the Green Deal and make Europe a climate-neutral continent¹. Clearly, a significant challenge lies ahead for this target to be delivered, with only 22 GW of offshore wind capacity installed in European waters up to the end of 2019².

That being said, **Europe has access to a tremendous offshore wind resource, and this target is achievable**. A recent WindEurope paper has identified zones where this 450 GW could be located³, highlighting a **potential for 85 GW in the Atlantic Ocean, including the Irish and Celtic Seas**.

To reach this ambitious European target, a business-as-usual approach to offshore wind development will not be sufficient.

Europe will need more coordinated marine spatial planning, streamlined permitting procedures and guidance, the large-scale build-out of an integrated transmission system and market design reform, among other things.

The coordination of multiple stakeholders across a range of complex processes and components and the different stages of the project life cycle will be required as the industry evolves towards larger turbines and into more challenging environments. **A future-proofed supply chain must be developed for Europe including the required investment in our ports and grid**. The EU can and should drive this development and investment through the ORES.

The coexistence of offshore wind / ORE sector with other marine users in the EU's sea basins – particularly the fishing industry – will be essential to the sustainable, efficient development of ORE. The EC has a role to play here as an impartial body in understanding and supporting the co-location and close collaboration of various sea users.

EU and individual member states can facilitate this growth potential by having in place adequate policy and support processes to support the future deployment of offshore wind off Ireland's coastline. **A supportive EU policy, regulatory and R&D environment will assist with sector growth and can offer economic and social benefits including large scale employment onshore and offshore during the development, construction and operation of an offshore wind farm.**

¹https://ec.europa.eu/energy/topics/renewable-energy/onshore-and-offshore-wind_en

²<https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Offshore-Statistics-2019.pdf>

³<https://windeurope.org/wp-content/uploads/files/about-wind/reports/WindEurope-Our-Energy-Our-Future.pdf>

It is imperative this **messaging is strategically communicated to the wider public to ensure there is buy in to the offshore wind sector across all EU jurisdictions and a strong social license to operate is earned.**

More nascent technologies such as **floating offshore wind and green hydrogen will also have a critical role to play in this ORE revolution and should be prioritised and supported by the EC.**

The Irish Wind Energy Association (IWEA) welcomes an Offshore Renewable Energy Strategy for Europe, which should identify the major challenges that lie ahead for the development of offshore wind across Europe, start the process of trying to overcome these challenges, and **provide key enablers to the future development of offshore wind, ORE and supporting ancillary infrastructure throughout Europe.**

Many of these challenges will need to be overcome in Ireland if we are to reach our 2030 target of 5 GW or realise our longer-term ambition of 30 GW of floating offshore wind⁴ and **Ireland is well placed and willing to step forward as a leader in offshore wind and ORE whilst contributing to a climate neutral EU by 2050.**

⁴<https://static.rasset.ie/documents/news/2020/06/programmeforgovernment-june2020-final.pdf>

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1 Introduction

The Irish Wind Energy Association (IWEA) is the representative body for the Irish wind industry, working to promote wind energy as an essential, economical, and environmentally friendly part of the country's low-carbon energy future. IWEA is Ireland's largest renewable energy organisation with more than 150 members who have come together to plan, build, operate and support the development of the country's chief renewable energy resource.

IWEA welcomes the opportunity to provide its input to the Offshore Renewable Energy Strategy (ORES), which will be key enabler in helping Europe reach its targets under the European Green Deal and become a climate-neutral continent by 2050.

IWEA believes that the ORES Roadmap identifies many of the key areas that will need to be addressed to ensure the massive potential of ORE in Europe can be realised in a sustainable and efficient manner.

This position paper provides a more detailed response on the ORES and key challenges that IWEA believes will need to be overcome in achieving Europe's carbon-neutral ambitions. IWEA have structured this position paper to highlight:

1. The status of the Irish offshore wind market and its potential to contribute significantly to the EU's plans for 450 GW of offshore wind by 2050 ensuring that the same consideration be given to the Atlantic Ocean and the Irish and Celtic Seas as other prominent offshore wind jurisdictions;
2. The benefits of offshore wind energy and the need to develop strategic communication initiatives for promoting these benefits to Member State economies and to coastal communities hosting offshore wind energy developments;
3. The promotion of a coordinated adaptation of the energy network to facilitate offshore wind energy at scale in European waters and ensure a fully integrated transmission system;
4. That market design reform should be encouraged and accompanied by a stable regulatory framework, including long-term revenue stabilisation mechanisms such as an EU wide auction for very large-scale volumes of renewable electricity;
5. The need for European alignment on MSP approaches, legislative underpinning and guidance to ensure sustainable management and governance of our European waters inclusive of innovative approaches to co-existence between marine users;

6. The need for strategic port infrastructure investment to support the rapid growth of offshore wind energy development and futureproofed to facilitate the rapid advances in technology inclusive of floating offshore wind;
7. The requirement to accelerate commercial floating offshore wind energy to achieve the 450 GW of offshore wind and contribute to new routes to market such as the production of fuels, such as green hydrogen, which are key to the decarbonisation of the transport and heating sectors;
8. The importance of cross-jurisdictional collaboration to help drive innovations in EU policy change.

Each section of this position paper provides recommendations that we would ask the European Commission to consider in developing an Offshore Renewable Energy Strategy for the EU.

2 Ireland's offshore activities and interest in the ORES

Europe sits on one of the world's best offshore wind resources and is already the global leader in offshore wind. Offshore wind could generate between 2,600 and 6,000 TWh/year at a price of below €65/MWh⁵.

The European Commission has highlighted that Europe will need between 230-450GW of offshore wind by 2050 to achieve carbon neutrality⁶. The EU Commission's goals for offshore wind are achievable, provided the right investments are made in electricity grids and governments take the right approach to maritime spatial planning⁷. This demands an ambitious EU-wide coordinated and long-term approach.

Ireland has a proven track record in wind energy. In 2019, a third of all electricity demand in Ireland was met by wind power and this was almost 37 per cent per cent for the first half of 2020. To date, Ireland has almost exclusively focused on its onshore wind resource but this is set to change with over 15 GW of offshore wind energy projects at varying stages of development in Irish waters⁸ driven by growing national energy policy certainty which has given confidence to investors that Ireland is open for business. It is anticipated that the earliest of these projects will be delivered circa 2025. Furthermore, it was research carried out by IWEA⁹ which led to the Irish Government setting a target of 70 per cent renewable electricity by 2030 now underpinned by a 5 GW target for offshore wind in the new Programme for Government. Together with policymakers and stakeholders across Government departments, State agencies and the port industry, IWEA is helping to shape the future of offshore renewable energy off the coast of Ireland and far into the Atlantic Ocean.

Ireland's CAP¹⁰ and new Programme for Government¹¹ have outlined ambitious domestic targets of at least 3.5 GW and 5 GW of offshore wind by 2030 respectively. Furthermore, **Ireland's Programme for Government highlights its intention to realise the massive potential of offshore energy in Irish waters by making Ireland a major contributor to a pan-European renewable energy system with at least 30 GW of floating offshore wind being deployed.**

⁵<https://windeurope.org/wp-content/uploads/files/about-wind/reports/Unleashing-Europes-offshore-wind-potential.pdf>

⁶European Commission, 2018. A Clean Planet for All

⁷<https://windeurope.org/wp-content/uploads/files/about-wind/reports/WindEurope-Our-Energy-Our-Future.pdf>

⁸ IWEA offshore wind energy developer survey conducted Q3 2020

⁹ <https://iwea.com/images/files/70by30-report-final.pdf>

¹⁰ https://www.dccae.gov.ie/en-ie/climate-action/publications/Documents/16/Climate_Action_Plan_2019.pdf

¹¹<https://static.rasset.ie/documents/news/2020/06/programmeforgovernment-june2020-final.pdf>

IWEA believes Ireland is well placed to contribute to Europe's approach. A recent report by WindEurope highlighted Ireland's Atlantic zone has the potential to contribute 85 GW to this which is illustrated in Figure 1 below. This would equate to almost 20 per cent of the estimated 450 GW required by 2050 to keep temperature rises below 1.5°C¹².

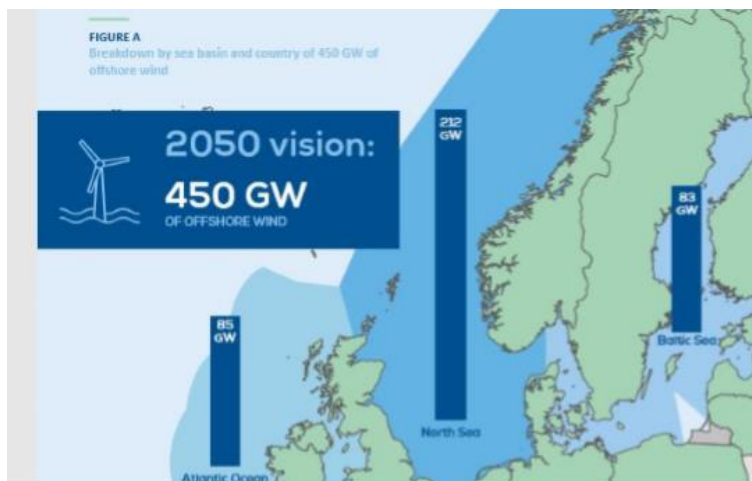


Figure 1: Breakdown by sea basin and country of 450GW of offshore wind

Ireland's maritime territory stretches far beyond our Atlantic Coast to cover approximately 880,000

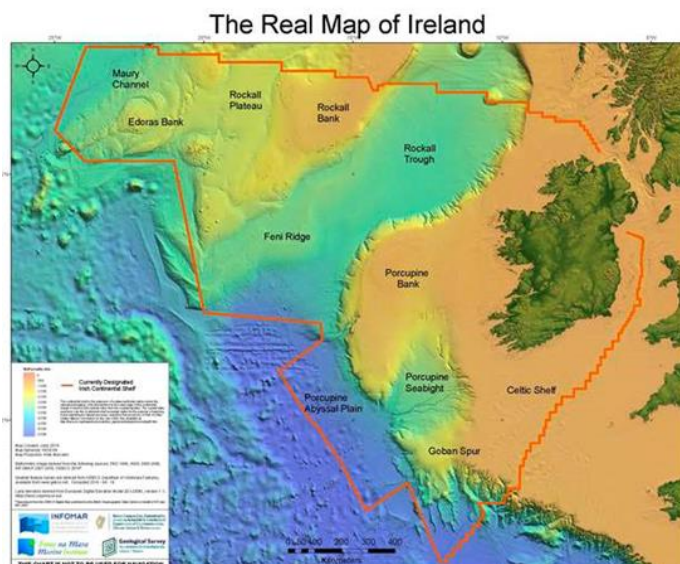


Figure 2: Ireland's maritime area¹³

square kilometres, an area significantly larger than the North Sea. This is highlighted in Figure 2 below. Ireland has a massive offshore wind energy resource, generally considered to be some of the

¹² https://ec.europa.eu/energy/topics/renewable-energy/onshore-and-offshore-wind_en

¹³ <https://www.marine.ie/Home/site-area/irelands-marine-resource/real-map-ireland>

best offshore wind energy conditions in the world. This is displayed in Figure 3 below. Due to bathymetric conditions around the Irish coastline it is anticipated that a significant amount of this

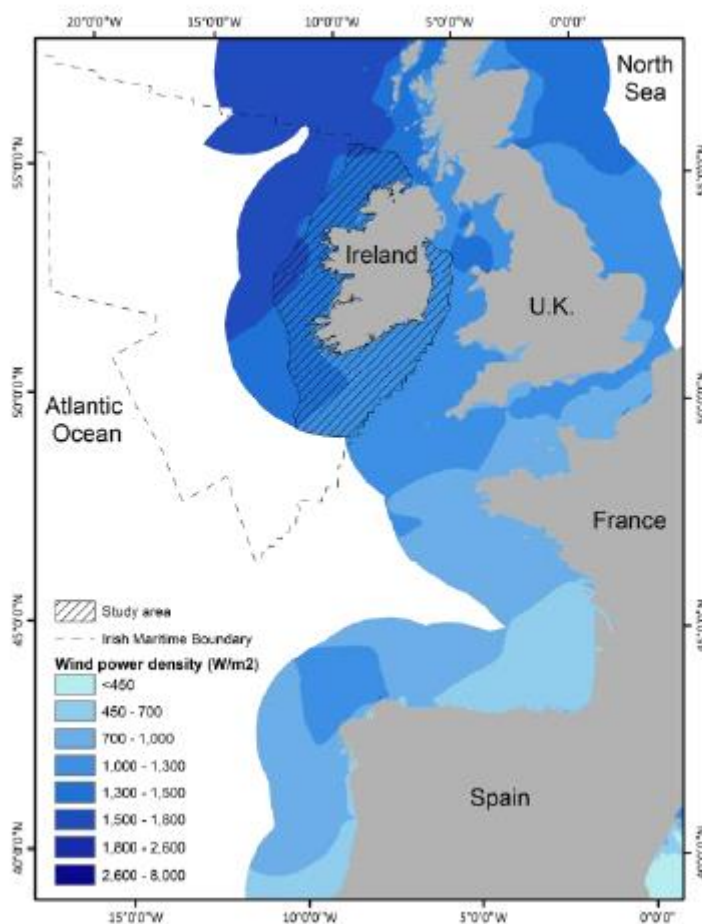


Figure 3: Modelled wind resource relative to energy density¹⁴

capacity will have to be delivered through floating offshore wind energy technology once the low-hanging fruit of near-shore fixed bottom opportunities are maximised. This is especially the case for the Celtic Sea and the Atlantic Ocean.

Offshore wind will be central to Europe delivering the Green Deal and sustainably growing the green economy and green recovery in the aftermath of the Covid-19 pandemic. The EU Recovery Plan has the potential to accelerate the offshore wind sector in Europe. Through its plans and investment via grants and loans, aimed at recovering from the damage of Covid-19, the plan aims to modernise the EU economy and transition from fossil fuels in a just manner. The delivery at scale of the offshore wind sector and supporting infrastructure in Europe will be economically transformative. IWEA believes

¹⁴ <https://www.marei.ie/wp-content/uploads/2020/07/EirWind-Blueprint-July-2020.pdf>

that Ireland can be a driving force in achieving this objective in close collaboration with Member States.

Based on forecasted electricity demand for the island of Ireland, it is envisioned that a significant amount of Ireland's proposed offshore wind capacity will need to be connected to the European grid directly alongside facilitating new and innovative routes to market such as the production of green hydrogen.

Ireland's excellent wind resource can deliver much-needed renewable electricity and fuel to European demand centres. In this regard, Irish wind is no longer an Irish resource, but a European one and, for the European Commission, there is an opportunity to shape a completely new offshore wind industry off the continent's coast. It is a priority for IWEA to ensure that Ireland's offshore wind energy potential and the ambition reflected in the new Programme for Government is central to the EU's ambition to achieve carbon neutrality by 2050.

IWEA welcomes studies financed by the European Commission which are ongoing regarding the deployment of ORE in the Baltic, Mediterranean and North Seas, as these will be key locations for the roll-out of ORE over the coming decades. It is crucial however, that other important locations; the Atlantic Ocean, the Irish Sea and the Celtic Sea are also given the necessary attention by the European Commission.

Recommendation: The same consideration should be given to the Atlantic Ocean and the Irish and Celtic Seas as other prominent offshore wind jurisdictions, to ensure the vast potential for the deployment of ORE in this area can be realised in a sustainable and efficient manner and contribute to Europe's target of 450 GW by 2050.

3 Benefits of hosting offshore wind

Offshore wind is an indigenous and renewable resource. Offshore wind farms' high capacity factors (40-50%) make it very reliable. The IEA says it could be Europe's main source of power generation by 2042¹⁵. The sector has attracted annual average investments of €9.4bn in the last decade, more than any other renewable technology. These investments spill over to regenerate coastal communities and provide economic opportunities and jobs to sunset industries.

IWEA recently commissioned The Carbon Trust to carry out research into the investment and supply chain opportunity of deploying offshore wind in Irish waters. The report, *Harnessing our potential*¹⁶, highlighted that delivering just the 3.5 GW of offshore wind energy required under the Climate Action Plan will require an initial investment worth €8.6 billion, create 2,500 local jobs in planning, development and construction, and provide 700 local long-term jobs in operations and maintenance, alongside of a lifetime spend of €17.9 billion. This positive impact is not exclusive for Ireland and would have a positive impact for any region within the EU.

The report also points out that this will equate to as many as 20,000 wider employment opportunities during the lifecycle of these projects. This is reflective of the procurement and manufacturing jobs associated with delivering offshore wind, the majority (~16,000) of which will be based within EU factories manufacturing components.

It is important to note that building capability in areas of infrastructure such as ports, enterprise and skills is key to delivering the socio-economic benefits to local areas and regions and offshore wind at scale will be central to economic development in Europe. IWEA strongly believes that EU and individual member states can facilitate this growth potential by having in place adequate policy and support processes to support the future deployment of offshore wind off Ireland's coastline. A supportive EU policy and regulatory environment will assist with sector growth and can offer economic and social benefits including large scale employment onshore and offshore during the development, construction and operation of an offshore wind farm.

It is therefore key that this messaging is communicated to the wider public to ensure there is buy in to the offshore wind sector across EU jurisdiction and a strong social license to operate is earned. Furthermore, it is imperative the right policies are implemented at EU level as an incentive for offshore wind energy success at national levels. IWEA member companies are keen to bring their expertise,

¹⁵ <https://www.iea.org/reports/offshore-wind-outlook-2019>

¹⁶ <https://iwea.com/images/files/final-harnessing-our-potential-report-may-2020.pdf>

their experience and their understanding of offshore renewables, to help design an offshore renewable future that will put Ireland at the heart of Europe's clean energy supply.

Recommendation: The EC should look to develop strategic communication initiatives for promoting the benefits of offshore wind energy development to Member State economies and to coastal communities hosting offshore wind energy developments.

Recommendation: The EC should facilitate offshore wind growth potential by having in place adequate cross-jurisdictional policy and processes to support the future deployment of offshore and ensure potential benefits are realised.

4 A fully integrated transmission system

IWEA strongly believes that EU support is needed for the coordinated adaptation of the energy network to facilitate offshore wind energy at scale in European waters. The build-out of an integrated transmission system over the coming years will be key to an internal energy market and whether or not the EU can reach its 2050 targets of up to 450 GW of offshore and 750 GW of onshore wind. It will also ensure plans for the increased electrification of industries such as heat and transport can be achieved, which will further lower EU carbon emissions.

While the current rate of build of power grids is too slow to reach these targets, and will certainly need to be improved, the grid will also need to be adapted so the vast offshore wind resources in the Atlantic Ocean and the Northern Seas can be fully exploited. Increased interconnection will be needed to ensure the electricity generated in these areas with a lower cost of production can be sent to high demand areas with decreased access to cheap renewable electricity.

Ireland is a perfect case study which shows how important the future development of a pan-European transmission system will be to Europe's offshore wind targets. Ireland is a relatively small country, with a population of 4.9 million that is projected to grow to 6.2 million by 2050¹⁷. Despite projections for significant growth in domestic demand for electricity here of up to 47% over the next 10 years¹⁸, Ireland has access to a greater offshore wind resource than it will ever need domestically. EirWind estimates that if the domestic electricity market and interconnectors are realised to their full potential, Ireland would still only need 8.9 GW of offshore wind by 2050. Despite this fact, Ireland's Programme for Government has committed to exploiting a potential of at least 30 GW of offshore floating wind in our deeper water in the Atlantic. This target is contingent on Ireland becoming a major

¹⁷<https://ec.europa.eu/eurostat/web/population-demography-migration-projections/data/database>

¹⁸<http://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-Group-All-Island-Generation-Capacity-Statement-2019-2028.pdf>

contributor to a pan-European renewable energy generation and transmission system. If this pan-European system is not forthcoming, this target will not be achieved. Ireland may be an unusual example, but there will be other countries in Europe whose development of offshore wind will similarly be limited by the market, rather than the resource.

The development of this grid will require coordination between European countries and targeted policy frameworks at an EU level, to ensure efficient planning, permitting and construction.

The 'SuperGrid' concept being promoted by SuperNode¹⁹ is a potential example of the future grid that will be needed to accommodate the vast amounts of renewable energy planned for 2050. This meshed direct current network could potentially realise the optimal amount of European interconnection and renewable energy and increase the energy security of the entire continent. This concept is still at an early stage and research in this area is needed.

Recommendation: A fully integrated, pan-European renewable energy generation and transmission system should be prioritised to ensure countries will not have to curtail their investment in ORE, while improving European energy security and making the 2050 target of 450 GW of offshore wind viable.

¹⁹ <https://supernode.energy/about/>

5 Market Design Considerations

The electricity market needs to be fit for purpose and to keep pace with the sector as we reach a point where most of our power comes from renewables. Coupled with developing a fully integrated transmission system, this will be crucial to Europe reaching its 2050 targets. One will not work without the other. Already, increased curtailment and negative pricing events are being seen across Europe, indicating a need for increased flexibility and export capabilities.

A market driven investment environment is the best way to provide long-term price signals together with the necessary stability needed to trigger investment and increase the share of wind energy in the power mix. Prices should have all externalities, such as the cost of carbon emissions, included.

Several things are needed to ensure the electricity market can perform adequately over the next 30 years. These include ETS reform, fostering cross-border trading, including the commercial provision of ancillary services from renewables as a fundamental feature and increased transparency and appropriate safeguards on curtailment practices²⁰.

Proper implementation of the Clean Energy Package across Europe will also be key to this. Recent consultations on the implementation of Articles 12 and 13 relating to priority dispatch and compensation for dispatch down in Ireland have shown that this will not be a simple process. Cooperation on this across Member States should be encouraged to ensure learnings and knowledge can be shared and regulations are implemented as they were intended to be.

Market design reform should be accompanied by a stable regulatory framework, including long-term revenue stabilisation mechanisms. Two-sided contracts-for-difference have proven to be effective in this regard. There is a value to society in having long-term revenue certainty for renewables, especially from offshore wind. Securing the price of electricity years in advance is a benefit to society which guarantees affordability and security of supply and should be seen as such.

Governments should opt for auction designs which give this long-term certainty while allowing Member States to access renewable energy in their neighbouring countries, and the ORES should encourage this. While two-sided contracts-for-difference have proven effective so far and should be encouraged, as the market evolves there may come a time when other instruments are more suitable and useful to provide price certainty for developers. For example, the EU will require very large volumes of renewable electricity that feeds into the entire EU electricity system so this may be best

²⁰ <https://windeurope.org/fileadmin/files/library/publications/position-papers/EWEA-Position-Paper-Market-Design.pdf>

facilitated by EU-wide auctions rather than national level auctions. This must be considered if and when this occurs.

Other related policies such as the electrification of energy, CO2 pricing and Power Purchase Agreements will also give market certainties to the investors in the future.

Recommendation: Market design reform should be accompanied by a stable regulatory framework, including long-term revenue stabilisation mechanisms, such as contracts-for-difference, with Governments opting for designs which give this long-term certainty while allowing Member States to access renewable energy in their neighbouring countries.

Recommendation: Consideration should be given for market evolution beyond CfD over the coming decades inclusive of feasibility for cross jurisdictional mechanism aimed at providing revenue stabilisation.

6 Sustainability and environmental protection

6.1 Marine Spatial Planning

All Member States must have a Marine Spatial Plan (MSP) in place by March 2021. Ireland is currently finalising its plan, the National Marine Planning Framework, and IWEA sees this as a critical tool for industry and decisions-makers for delivering sustainable offshore projects in Ireland's waters in the short term. However, how Member States MSPs will interact with one another will be key to enabling Europe's offshore ambitions in the medium to long term.

In support of this, the legislative underpinning of marine spatial planning will be key to unlocking the volume of offshore wind energy deployment required to meet Europe's requirements. Therefore, having a clear permitting assessment procedure in line with EU standards will ensure that environmental impacts are assessed and mitigated as part of the site selection, permitting and construction operation process. Adoption of standard guidelines of assessment, although legislatively challenging, would be welcomed in this regard. Ensuring this consistency regarding development guidelines and assessment criteria across the EU would ensure all projects are assessed using the same parameters and would be a key cooperative tool in helping to unlock the deployment of 450 GW of offshore wind power. In support of this, coordination on environmental impacts, social impacts and associated data on offshore wind energy development should be compiled, gaps addressed and made readily available through a central European body to ensure cross-jurisdictional knowledge sharing and contribution to research and innovation. This could include, for example, the co-existence of MPAs / other special areas of protection and offshore wind farms and the associated impacts and benefits on biodiversity restoration and conservation and the development of new areas of research focussed upon promoting Natural Capital²¹. EirWind, a recent research project based out of the MaREI centre in University College Cork²² highlights the potential to co-locate offshore wind farms and MPAs are one example of this kind of research that could be developed further.

IWEA believe this approach would contribute further to a strong ecosystems approach whilst providing certainty and equity for offshore wind developers and other marine users. It is certain there will be challenges in this regard, but also innovations required to facilitate the kind of co-existence that is required if we are to optimise the European Blue Economy whilst also improving the environmental status of our marine ecosystems. As part of this the EC should look to compare member

²¹ https://ec.europa.eu/environment/nature/capital_accounting/index_en.htm

²² M. Sweeney and V. Cummins (2020), A Discussion about the Co-location of Offshore Wind Farms and Marine Protected Areas, Eirwind, MaREI, UCC

states MSP approaches with a view to providing recommendations on future alignment for the sustainable management and governance of our European waters.

Significant increases in Marine Protected Areas (MPA) out to 2030 as directed by the Marine Strategy Framework Directive (MSFD) and beyond is aimed at protecting our natural marine resources and ecosystems that are under threat. Climate change and the warming of seas globally is having one of the biggest impacts on abundance of species and habitats and it is therefore imperative that one of the core principles of marine spatial planning, protection of our natural marine resources is aligned to climate change policy, targets and law and ensuring that relevant EU Directives, most notably the MSFD and MSPD are reviewed to give direction to member states. One way of achieving this could be for NECP targets to be reflected in member states MSPs. Furthermore, as MPAs increase and competition for marine users and resources increases, it is important that the area of co-existence is addressed.

The co-existence of fisheries and offshore wind is also a critical issue for co-existence within EU waters. IWEA believe that the EU has a central role to play here is understanding and supporting the co-location of the fishing community and offshore wind and is something that the EU could bring some rationality as we work closely to achieve the ambitious target of 450 GW. There are already good examples of coexistence with fishing activities that allow for things like alternative employment, compensations schemes and other pre-consenting agreements. IWEA would like to draw the attention of the EC to the Fishing Liaison with Offshore Wind and Wet Renewables Group (FLOWW)²³ in Scotland which is a best practice example of how offshore wind and the fishing community can interact and co-exist. The FLOWW was set up in 2002 to foster good relations between the fishing and offshore renewable energy sectors and to encourage co-existence between both industries. FLOWW's objectives are to enable and facilitate discussion on matters arising from the interaction of the fishing and offshore renewable energy industries, to promote and share best practice, and to encourage liaison with other sectors in the marine environment.

Marine Spatial Planning, and how EU Member States' Marine Spatial Plans interact, will be key to enabling Europe's offshore ambitions. Ensuring consistency regarding development guidelines and assessment criteria and having a clear permitting assessment procedure across the EU would ensure all projects are assessed using the same parameters. This would require the alignment of Marine Spatial Plans at a sea basin level, which IWEA believe should be led by the Commission through the establishment of a dedicated overarching marine body.

²³ <https://www.sff.co.uk/floww/>

Recommendation: A specialist marine body should be formed to align marine special plans and address co-existence at a sea basin level.

Recommendation: The EC should look to compare member states MSP approaches, legislative underpinning and guidance with a view to providing recommendations on future alignment for the sustainable management and governance of our European waters.

Recommendation: The EC should look to investigate the promoting co-existence of offshore wind and MPAs alongside of coexistence between fisheries and offshore wind through targeted research projects and pilot projects.

7 Investment in port infrastructure and the supply chain

IWEA welcomes a focus within the ORES Roadmap on the development of port infrastructure, and the need for investment in this area. The importance of investing in port infrastructure to support growth in offshore wind and create local supply chains cannot be overstated. This has been a major factor in the success of European offshore wind to date.

Ports also play a unique role in cost reduction and efficiency of offshore wind projects. According to Wind Europe's Offshore Wind Ports Platform, investing €0.5 - €1 billion in port infrastructure could save the equivalent CAPEX of €5.5 billion for 30 GW of new installations and reduce the levelised cost of energy of this capacity by up to 5.3%²⁴. There are mutual benefits which offshore wind developers, supply chain companies and port authorities can take advantage of due to the development of offshore wind farms.

For Ireland, the development of a construction port or marshalling facility will be a key element of Ireland delivering upon its offshore wind energy targets and leveraging further capability. The Carbon Trust report, *Harnessing our potential*²⁵ highlighted 4 key recommendations for Ireland:

1. Strategic investment into one or more Irish ports (e.g. a marshalling facility from which to build projects)
2. Develop offshore wind enterprise hubs around these ports
3. Build on developing offshore wind clusters around port hubs
4. Address the skills shortage

As part of the report, Carbon Trust carried out a port requirement assessment – for all the relevant ports in Ireland (both construction and O&M ports) as part of the study – across physical characteristics, port connectivity and layout. The report highlighted several Irish ports that were suitable to facilitate a marshalling facility for offshore wind deployment. Rosslare Europort, Greenore and Cork were all presented as having potential for the east and south coast projects, a caveat being that significant investment would be required to facilitate this. However, recent announcements from Rosslare Europort have outlined the upgrading of the port facilities in this regard which is welcomed. Furthermore, Dutch logistics company XELLZ through their subsidiary 24shore SBS Ltd. have invested in the port and commenced the development of a staging, storage and assembly base facility alongside

²⁴<https://windeurope.org/newsroom/press-releases/investments-in-port-facilities-could-help-offshore-wind-cut-costs-by-5-3-percent/>

²⁵ <https://iwea.com/images/files/final-harnessing-our-potential-report-may-2020.pdf>

of a Europort Business Park and centre of excellence that will act as an offshore wind enterprise hub using a Freezone or Freeport model and facilitate clustering of offshore wind energy companies. 24shore SBS Ltd. have estimated job creation of over 2000 for the region. It is envisaged that Rosslare will be positioned to become an international hub for export of energy and services to large parts of Europe.

Shannon Foynes Port Company comes out as front runner as the west coast opportunity but also potential for Galway and Killybegs – again there is significant investment required to realise these opportunities. With the west coast ports there is an opportunity to develop manufacturing facilities for floating offshore wind at these port locations. Fixed bottom offshore wind manufacturing bases are fairly established within Europe but there is an opportunity with the delivery of floating offshore wind energy targets for Ireland to be a front runner in the race for manufacturing for floating wind inclusive of fabrication of foundation technologies and towers.

It is important to note here that there is a commercial opportunity of €70million for a staging of marshalling port for delivering the 3.5 GW outlined in the CAP and the potential to support over 2,500 local development and construction jobs through building projects of this port.

IWEA believe there is an opportunity to not only service the construction of Irish offshore wind energy projects from its ports, but also service the construction and provide support services to other European jurisdictions for project installation. The offshore wind energy supply chain is highly competitive and projects looking to build compete globally for limited specialist vessels and adequate port facilities. IWEA believe that the offshore wind supply chain will become even more constrained as we progress towards 2030 and beyond to the 450 GW required to deliver Europe's carbon neutral 2050. The European Investment Bank has highlighted a willingness to provide finance for the green recovery and the kind of infrastructure support required to deliver offshore wind such as ports. IWEA believe the European Commission should prioritise investment through targeted funding calls and grants of suitable port infrastructure to service the construction of offshore wind energy projects in the EU.

IWEA believes neighbouring jurisdictions should work together to identify strategic ports and infrastructure required to deliver shared projects.

Recommendation: Port infrastructure should be invested in and developed to support the rapid growth of offshore wind energy development and futureproofed to facilitate the rapid advances in technology inclusive of floating offshore wind. EU funding for strategic investment in ports, suitable for both bottom-fixed and floating industrial needs, should be made available.

Recommendation: To ensure the required investment in port infrastructure occurs, a consistent pipeline of projects must exist, to address the market risk for port authorities and supply chain companies and guarantee a return on their investment. While much of this will depend on the policy decisions of individual Member States, EU policy can help here too, by providing long term visibility and certainty for industry and ports through its ORES strategy.

8 Floating Offshore Wind (FLOW)

FLOW will be key to Europe's medium-to-long term ORE and climate targets, with Wind Europe estimating there could be as much as 150 GW of FLOW in European waters by 2050²⁶, assuming sufficient support and leadership is shown at an EU level. Ireland has significant potential to contribute to this 150 GW, and its new Programme for Government has set an ambitious target of at least 30 GW of FLOW in our deeper waters in the Atlantic²⁷.

To reach this 150 GW figure, FLOW must become cost-competitive with bottom-fixed in the near future. FLOW technology is already evolving rapidly, and it is anticipated that its costs will decrease significantly over the next decade and beyond, following similar trajectories to that of onshore wind and fixed bottom offshore wind²⁸. While the LCOE of FLOW should fall as deployment volumes increase, the policies put in place will have a large impact on the pace at which this will happen. A number of things can be done at an EU level to hasten this LCOE decline and ensure Europe's massive potential for FLOW is exploited.

Europe is the world leader in bottom-fixed offshore wind. To become the world leader in FLOW, the huge experience built up in the bottom-fixed offshore wind sector should be leveraged to gain efficiencies and accelerate the deployment of FLOW across Europe. Collaboration between industry and policy makers should be encouraged to do this.

A clear vision and target for FLOW in Europe over the next decade and beyond should be set. This will provide certainty for industry, developers and investors and encourage innovations in FLOW. The recently released Hydrogen Strategy²⁹ is an example of how this vision could be delivered. Member States should also be encouraged to include plans for FLOW in their National Energy and Climate Plans, which the European Commission should assess.

On a similar note, a recent report in the UK, *Floating Wind: The UK Industry Ambition*³⁰, outlines a vision for the FLOW sector in the UK. The report sets out three key enablers for this vision:

1. Government, working with industry, should develop a competitive market framework that promotes the development of FLOW;

²⁶ <https://windeurope.org/newsroom/news/floating-offshore-wind-is-gearing-up-for-take-off/>

²⁷

https://www.greenparty.ie/wpcontent/uploads/2020/06/ProgrammeforGovernment_June2020_Final_accessible.pdf

²⁸ <https://windeurope.org/wp-content/uploads/files/about-wind/reports/Floating-offshore-statement.pdf>

²⁹ https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf

³⁰ <https://www.renewableuk.com/store/ViewProduct.aspx?id=15079206>

2. Future marine spatial planning and leasing processes around the whole of the UK should allow for commercial floating wind sites to be made available;
3. Government and industry should work to identify and deliver joint investments in infrastructure underpinning the development of FLOW and its supply chain.

This report has been central to the progression of the first enabler above within the UK. IWEA believes that such a model would be useful to set a vision and key enablers for accelerating FLOW at an EU level, with the Commission well placed to work with the industry on this.

Eirwind, a recent industry research collaboration with MaREI in University College Cork, outlines a blueprint for offshore wind in Ireland out to 2050. This prescribes technology specific auctions for FLOW and the provision of revenue support for pre-commercial demonstrators in advance of this. Pre-commercial projects will bridge the gap between early demonstrations and commercial scale projects and grow confidence in the industry. Early auctions for commercial projects should treat FLOW as an emerging technology and facilitate progress towards long-term competitiveness. It is important that the European Commission and Member States facilitate the installation of pre-commercial projects and ensure early commercial projects have unfettered access to a route to market.

EU funding could also be an important enabler to kick-start FLOW in Ireland, and beyond. The European Commission should prioritise funding for the industrialisation of FLOW, whether this is through the InnovFin Energy programme, Horizon Europe, the ETS Innovation Fund or a FLOW specific initiative. Ireland is an ideal location for pilot project funding for FLOW as we progress through the decade.

The export opportunity will also be key to the development of FLOW. As mentioned in section 4 above, Ireland has the potential to produce much more renewable electricity than it can consume domestically. The 30 GW FLOW target laid out in Ireland's Program for Government will only be achieved and contribute to European ORE targets if a significant amount of this electricity produced can be exported to the rest of Europe. Other countries will similarly be relying on exports to fully capitalise on their ORE potential. This will require the development of a pan-European transmission system such as the SuperGrid concept discussed in section 4, and market design reforms, as discussed in section 5. If these are not prioritised, targets around ORE will be much harder, if not impossible, to achieve.

The use of green or renewable hydrogen to replace fossil fuels in carbon intensive industrial processes will also be key to growing the export market in Europe while overcoming limitations on offshore installed capacity beyond 2030. Offshore wind and particularly FLOW will be key to producing green

hydrogen in the future, with the EU's Hydrogen Strategy targeting the production of up to 10 million tonnes by 2030. Similarly, green hydrogen can provide an innovative route to market for FLOW. The synergies between these technologies provide a great opportunity for FLOW to aid the development of green hydrogen, and vice versa. EirWind has recommended a 100 MW pilot hydrogen facility, linked to FLOW, as a kick-starter project to build towards a vision of Ireland as an EU global centre for hydrogen technology. Projects such as this should be encouraged and funded at an EU level.

R&D into FLOW, along with investment in port infrastructure and the supply chain, as discussed in section 7, will also be key to lowering costs, closing the gap between FLOW and bottom-fixed supply chains, and refining technology designs for mass production.

Recommendation: Key enablers for the deployment of floating offshore wind should be defined and prioritised to ensure the successful commercialisation of the technology across suitable member states. This should include a stepping-stone approach of pre-commercial demonstrators.

Recommendation: Other routes to market such as the production of green hydrogen should be prioritised to facilitate the deployment of floating offshore wind energy at scale in EU waters.

Recommendation: The EU should fund a pilot hydrogen facility, linked to FLOW, as a kick-starter project to build towards a vision of Ireland as an EU global centre for hydrogen technology.

9 Cross Jurisdictional Collaboration

The challenge of installing 450 GW of offshore wind by 2050 needs no explanation. Reaching this target will require systemic changes to the electricity system and market, vast improvements to how Europe's marine spaces are managed, and a coordinated, European-led approach. This will not be achieved without cross jurisdictional collaboration on several fronts, some of which are discussed below. It is imperative that the European Commission facilitates and encourages this collaboration.

A trend that is already emerging with offshore wind is the formation of alliances or groups with common goals and interests, including the North Sea Energy Cooperation, the FLOW Celtic Sea Alliance, the Offshore Wind Industry Council, and the Fishing Liaison and Offshore Wind and Wet Renewables Group. These groups have proven useful as fora for industry, Government, and key stakeholders to engage on important issues in relation to offshore wind. As offshore wind becomes more widespread and the electricity system transitions towards a pan-European system, this collaboration should be encouraged, and the Commission should look to ensure key stakeholders are working together.

As highlighted previously in the paper, the coexistence of offshore wind / ORE sector with other marine users in various sea basins - particularly the fishing industry – will be important to the sustainable, efficient development of ORE. The EC has a role to play here as an impartial body in understanding and supporting the co-location and close collaboration of various sea users.

Marine Spatial Planning, which is discussed in more detail in Section 6, and how Member States' Marine Spatial Plans interact, will be key to enabling Europe's offshore ambitions.

Sections 4 and 5, above, briefly discusses the idea of a pan-European electricity system, with changes needed to the grid and market design to achieve this. Clearly, developing a European 'Supergrid' and a fully integrated electricity market will not be achieved without the coordinated work of a number of bodies from all across the EU, including developers, Governments, Regulators, TSOs and the European Commission. This will be one of the major challenges to realising the Green Deal targets.

Technical harmonisation and standardisation will become more important as offshore wind becomes widespread in Europe, and the Commission will need to play a big part in this. The standardisation of training requirements, technical specifications, health and safety regulations, supply chain etc. will cut costs and ensure the safe and efficient mobility of workers across the EU. The WindHarmony Project³¹ on behalf of the European Commission, which is looking to standardise and align health and safety

³¹ https://www.windharmony.eu/about_the_project/

regulations across the EU, is a great example of the work that will be needed in the future to standardise procedures, regulations and supply chains across Europe.

As discussed in section 8, the use of green or renewable hydrogen to replace fossil fuels in carbon intensive industrial processes will also be key to growing the export market in Europe while overcoming limitations on offshore installed capacity beyond 2030. The publication of a hydrogen strategy for Europe has been useful to set a vision for the sector, but as the strategy says,

‘deploying hydrogen in Europe faces important challenges that neither the private sector nor Member States can address alone. Driving hydrogen development past the tipping point needs critical mass in investment, an enabling regulatory framework, new lead markets, sustained research and innovation into breakthrough technologies and for bringing new solutions to the market, a large-scale infrastructure network that only the EU and the single market can offer, and cooperation with our third country partners’

Cooperation on these areas will be crucial over the coming years to drive hydrogen development, which will in turn maximise Europe’s potential offshore wind development. According to Bloomberg New Energy Finance, global demand for renewable hydrogen could reach 275 million tonnes per year (equivalent to 9,150 TWh) by 2050, while electrolyser capacity could climb to 4,000 GW³². There is massive potential in this sector that must be realised. Pilot projects such as the one recommended by EirWind and discussed in section 9 above will be important to kick-start the production of green hydrogen in the EU and must be facilitated.

Projects of common interest are cross border infrastructure projects that link the energy systems of different countries and aimed at ensuring the EU achieves its energy policy and climate objectives³³. If the EU is to achieve a target of 450GW of offshore wind energy deployment in its waters, massive investment in research and innovation will be required. A key area of focus will need to impact energy markets and market integration to achieve the volume of projects required by 2050. IWEA believe the EC should prioritise these kinds of projects and ensure adequate funding is budgeted to facilitate offshore wind ambitions.

The supply chain is the lynch pin for the delivery of offshore wind at scale. The coordination of multiple stakeholders across a range of complex processes and components and the different stages of the project life cycle will be required as the industry evolves towards larger turbines and into more

³²<https://www.bloomberg.com/news/articles/2019-08-21/cost-of-hydrogen-from-renewables-to-plummet-next-decade-bnef>

³³https://ec.europa.eu/energy/topics/infrastructure/projects-common-interest/key-cross-border-infrastructure-projects_en#who-can-become-a-pci-

challenging environments. A future proofed supply chain must be developed. To aid the development of this supply chain, a clear pipeline of projects will be needed. The EU can encourage this by setting ambitious target for offshore wind, proposing long-term on- and offshore grid masterplans, implementing policies to electrify and decarbonise economies and promoting revenue stabilisation mechanisms that provide long-term investment certainty while keeping financing costs down.

Training and capacity building and improving public understanding and support for offshore wind development will require EU initiatives. These areas, although appearing “soft”, are imperative to the success of offshore wind energy at scale in EU waters and can ensure public buy-in and a social license for offshore wind.

Offshore wind development provides the potential for the creation of apprenticeships and training schemes within local areas. As examples, the Kerry Training Board currently offers wind turbine training in Ireland to provide the onshore wind industry with competent wind turbine technicians. Offshore wind developer Ørsted has an annual fund available to organisations that can offer STEM related training. These types of initiatives can benefit both the industry and local communities and will be important for the future development of the offshore wind supply chain. The Carbon Trust’s report on the Irish supply chain³⁴ identified addressing the skills shortage in Ireland through Government coordinated routes as one of the key recommendations of the report.

IWEA is supportive of the Maritime Alliance for fostering the European Blue Economy through a Marine Technology Skilling Strategy³⁵. This project will develop a long-term Strategy and Action Plan to tackle the current and future skills shortages in the maritime industry, in particular shipbuilding and offshore renewable energy. This will help to drive the just transition in the EU and ensure the sector is prepared to deliver on the 450GW targets outlined by the EC. Further calls aimed at offshore skills development and collaboration between universities, industry and training bodies are needed to push on from this work and the Commission should work closely to implement this.

IWEA is supportive of regional cooperation, one such example of this is its support of the FLOW Celtic Sea Alliance focussed on the collaborative development of floating offshore wind energy in the Celtic Sea by Cornwall, Ireland and Wales. Regional cooperation should also focus on shared economic zones and the coordination of the timing and frequency of tenders for offshore wind to smoothen the business cycle in the supply chain.

³⁴ <https://www.iwea.com/images/files/final-harnessing-our-potential-report-may-2020.pdf>

³⁵ <https://www.projectmates.eu/>

As BREXIT looms, the importance of shared economic zones will come into sharper focus. The UK have been world leaders in the deployment of offshore wind around their shoreline and it is important that this experience and expertise is not lost to the detriment of the EU offshore sector out to 2050.

Recommendation: Cross jurisdictional collaboration should be supported through targeted EU policy initiatives inclusive of innovative approaches to route to market such as facilitating cross jurisdictional support schemes alongside of shared economic zones that will contribute to capacity building and skills development

10 Conclusion

IWEA would like to thank the European Commission for the opportunity to provide our input to the development of Europe's Offshore Renewable Energy Strategy. The strategy is a critical milestone in achieving a climate-neutral Europe by 2050. The targets set out to reach this are challenging but are certainly achievable and the offshore wind energy industry in Europe is primed to deliver on the vision and leadership shown within the soon to be published strategy.

IWEA have set out a number of recommendations throughout this paper that we believe are essential to a successful offshore renewable energy transition for Europe and we would ask the European Commission to consider these as they finalise Europe's Offshore Renewable Energy Strategy.

IWEA would be happy to discuss these recommendations, which have been outlined again below, further with the Commission and are available for any future engagements where required.

- 1. Recommendation: The same consideration should be given to the Atlantic Ocean and the Irish and Celtic Seas as other prominent offshore wind jurisdictions, to ensure the vast potential for the deployment of ORE in this area can be realised in a sustainable and efficient manner and contribute to Europe's target of 450GW by 2050.***
- 2. Recommendation: The EC should look to develop strategic communication initiatives for promoting the benefits of offshore wind energy development to employment opportunity, Member State economies and to coastal communities hosting offshore wind energy developments.***
- 3. Recommendation: The EC should facilitate offshore wind growth potential by having in place adequate cross jurisdictional policy and processes to support the future deployment of offshore and ensure potential benefits are realised.***
- 4. Recommendation: A fully integrated, pan-European renewable energy generation and transmission system should be prioritised to ensure countries will not have to curtail their investment in ORE, while improving European energy security and making the 2050 target of 450 GW of offshore wind viable.***
- 5. Recommendation: Market design reform should be accompanied by a stable regulatory framework, including long-term revenue stabilisation mechanisms, such as contracts-for-difference, with Governments opting for designs which give this long-term certainty while allowing Member States to access renewable energy in their neighbouring countries.***
- 6. Recommendation: Consideration should be given for market evolution beyond CfD over the coming decades inclusive of feasibility for cross jurisdictional mechanism aimed at providing revenue stabilisation.***

7. **Recommendation:** *A specialist marine body should be formed to align marine special plans and address co-existence at a sea basin level.*
8. **Recommendation:** *The EC should look to compare member states MSP approaches, legislative underpinning and guidance with a view to providing recommendations on future alignment for the sustainable management and governance of our European waters.*
9. **Recommendation:** *The EC should look to investigate the promoting co-existence of offshore wind and MPA's alongside of coexistence between fisheries and offshore wind through targeted research projects and pilot projects.*
10. **Recommendation:** *Port infrastructure should be invested in and developed to support the rapid growth of offshore wind energy development and futureproofed to facilitate the rapid advances in technology inclusive of floating offshore wind. EU funding for strategic investment in ports, suitable for both bottom-fixed and floating industrial needs, should be made available.*
11. **Recommendation:** *To ensure the required investment in port infrastructure occurs, a consistent pipeline of projects must exist, to address the market risk for port authorities and supply chain companies and guarantee a return on their investment. While much of this will depend on the policy decisions of individual Member States, EU policy can help here too, by providing long term visibility and certainty for industry and ports thorough its ORES strategy.*
12. **Recommendation:** *Key enablers for the deployment of floating offshore wind should be defined and prioritised to ensure the successful commercialisation of the technology across suitable member states. This should include a steppingstone approach of pre-commercial demonstrators.*
13. **Recommendation:** *Other routes to market such as the production of green hydrogen should be prioritised to facilitate the deployment of floating offshore wind energy at scale in EU waters.*
14. **Recommendation:** *The EU should fund a pilot hydrogen facility, linked to FLOW, as a kick-starter project to build towards a vision of Ireland as an EU global centre for hydrogen technology.*
15. **Recommendation:** *Cross jurisdictional collaboration should be supported through targeted EU policy initiatives inclusive of innovative approaches to route to market such as facilitating cross jurisdictional support schemes alongside of shared economic zones that will contribute to capacity building and skills development.*