Chambers Ireland

Advancing business together

Chambers Ireland white paper on maximising the benefit of developing the national wind energy industry and the national grid

December 2020

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Executive Summary

As the impact of Climate Change has become ever more obvious, Chambers Ireland has become more active in calling for action in this area. Together with our 40 affiliated chambers we, in 2019, we signed a pledge to support the United Nation's Sustainable Development Goals, with Climate Action (Goal 13) being amongst the most important to our network.

The most important effort that we can make in this area is speedy passage of the Marine Planning and Development Management Bill, along with the creation of a robust Marine Planning Framework that allows for the rapid deployment of offshore windfarms.

Even if this was not something which we needed to do to meet our commitments to reduce our CO2 emissions, it is something that we ought to be doing as a country because of the myriad benefits:

1. Offshore wind has the capacity to transform our economy by helping us become a net exporter of electricity.
2. The operations and maintenance associated with offshore windfarms have the potential to bring thousands of high-quality, highly skilled, highly paid jobs to our economically disadvantaged regions for several decades.
3. Early engagement with the challenges associated with the deep-water floating platforms will allow us to nurture a high-technology capital intensive and highly skilled industry that has growth potential over generations to come.
4. The European Green Deal is ideally timed to allow us to access cheap capital at quantity over the coming decade.
5. The abundance of energy at a zero marginal cost creates huge opportunities for the Hydrogen industry.
6. In increasingly politically turbulent times, it will offer us energy security by removing the political risk that we suffer as a result of being at the edge of Europe, and at the end of very long supply chains.

Simultaneously, we will need to upgrade our local electricity distribution networks so that they can service for low carbon technologies which consume significant quantities of electricity (such as eVehicles and heat pumps).

Complementing these actions, we need to reinforce our electricity transmission system so that it facilitates this green electricity getting from where it is generated to where it is needed.

For Ireland, unlike many other countries, the transition away from fossil fuels creates an unprecedented opportunity. The most important task for the Irish State, in the coming decade is ensuring that we maximise these benefits for our society.

This document summarises the positions which the Chambers Ireland network has taken in our submissions on the Wind Energy Development Guidelines[1], the Commission for the Regulation of Utilities consultation on Price Review Five[2], Grid Development Policy for Offshore Wind[3], our Budget Submission for 2021[4], our General Election 2020 Manifesto[5], and various events and symposia which we have co-ordinated to raise the salience of climate action.

While all Climate Action is urgent, certain immediate actions are critical:

- **Passing legislation that supports the development of offshore windfarms**
- **Selecting port facilities which will allow Ireland to maximise value chain capture for offshore windfarm construction**
- **Creating certainty regarding energy security on the island**
- **Streamlining grid development to minimise planning process risks**
- **Reinforcing the High Voltage network to support transferring green electricity**
- **Upgrading Low and Medium Voltage networks to facilitate microgeneration**
- **Expanding the capacity of local networks to allow for high-demand technologies**

[1] Chambers Ireland Submission on the Draft Wind Energy Development Guidelines – February 2020
[2] Chambers Ireland Submission for the Public Consultation on Price Review 5 Electricity Networks | September 2020
[3] Chambers Ireland Submission for the Public Consultation to Inform a Grid Development Policy for Offshore Wind in Ireland | July 2020
[4] Chambers Ireland's Budget 2021 Submission
[5] General Election 2020 Manifesto

Chambers Ireland's Perspective on the Wind Industry

Chambers Ireland is the State's largest business representative network. We are an all-island organisation with a unique geographical reach; our members are the chambers of commerce in the cities and towns throughout the country – active in every constituency. Each of our member chambers is central to their local business community and all seek to promote thriving local economies that can support sustainable cities and communities.

Our network of chambers uses the Sustainable Development Goals to prioritise our policy analysis and recommendations. We are anxious to see the current regulatory regime reformed to ensure that offshore wind can be delivered efficiently and successfully by 2030. The existing regulations have delayed our development of an offshore wind industry which has damaged our country's capacity to meet our obligations under Climate Action (Goal 13) and Affordable Clean Energy (Goal 7). Reforms which do not deliver the 5GW necessary by 2030 or facilitate reaching that target while using grid assets inefficiently will hurt our economy's capacity to develop Sustainable Cities and Communities (Goal 11), Industry, Innovation and Infrastructure (Goal 9) and will ultimately undermine the challenge of creating Decent Work and Economic Growth (Goal 8).

Therefore, the Chambers Ireland Network is deeply interested and engaged with the development of wind, and other renewably sourced, energy.

The development of our wind energy industry is one of the greatest economic opportunities for our country since we joined the European Economic Community. With over $5 Trillion in investment in offshore renewables expected over the coming decade[6], the bulk of which will be in green hydrogen and wind energy, for the current

[6] Morgan Stanley Utilities Research Note 10 Nov 2020 "Energy Transition Titans: Big Oil's Big Threat Is Overblown"

administration a nationally critical task for the coming years will be facilitating our access to the coming green energy boom.

If successful, such a legacy project would see Ireland become energy self-sufficient in the first instance, it will allow us to export excess energy to the European grid, and will also allow us to take prominent position in nascent industries such as deep sea offshore windfarm construction, but will also allow us to be first movers in the skills intensive offshore platform industry, will give us a foothold in the export of green energy derived hydrogen/ammonia which will have the secondary benefit of reducing the carbon emissions of other state's through the substitution of green energy alternatives for industries such as aviation, shipping, and transport which require energy dense alternatives to the fossil fuels which they have a dependence on.

Concerns regarding the Climate Action Plan targets, and the revised EU 2030 emissions targets

If we are to meet our revised 2030 emission targets, we will have to reduce our total emissions by in excess of 20 million tons of CO_2. The Climate Action Plan aims to see half of that reduction arise through the migration of our electricity supply generation system to renewables. Half of that decline is to come from the increase in electricity generation using onshore wind. To increase this generation capacity of this sector we will need to double the scale of our onshore wind turbine fleet. Simultaneously we will need to create an offshore fleet which has a greater capacity that the entirety of our current onshore wind generated electricity supply.

Under the 2019 Climate Action Plan (which aimed at meeting the 40% reductions in EU emissions targets for 2030, rather than the 55% reduction that has been endorsed by the European Council[7]) the Irish fleet of onshore wind turbines would have had to double in capacity from 4GW to 8 GW in the coming 9 years. This scaling up may have to increase beyond that doubling if the new targets are to be met. The 2020 programme for

[7] European Council meeting (10 and 11 December 2020) – Conclusions

government "Our Shared Future"[8] envisages the creation of an offshore wind energy industry that will have expanded to supplying 5GW (larger than our current total land fleet) of electricity by 2030. However, **many of the projects which are in development may be unable to progress regulatory impediments in the planning process.**

Furthermore, if the proposed amendment to the Wind Energy Development Guidelines[9] is initiated as they were in their draft form in advance of the 2020 consultation, there is a risk that large parts of the existing onshore wind fleet will need to be decommissioned due to issues around flicker, noise and setback[10]. Compounding this, the repowering of many parts of the existing fleet will be impossible under the regulations as they were initially proposed.

The ambition for wind in Ireland over the coming decade is enormous as it requires us to more than treble the size of our wind energy production industry, the adoption of technologies new to the Irish electricity grid, and the upgrading/reinforcement/building of huge amounts of transmission equipment to bring the renewable energy from where it is generated to where it is needed. This effort requires a regulatory regime that supports that ambition to the fullest extent, and unfortunately our current regulatory system inhibits this. **The chief hindrance to meeting our climate goals is the absence of a planning system that facilitates offshore windfarm development. This needs to be the top priority of parliament.**

To meet those targets, we need a massive reduction in non-electricity-generation CO_2 emissions too. But this will only come through behavioural change and the adoption of novel technologies that allow for the electrification of our transport networks and making our heating systems efficient through the use of heat-pumps etc. These reductions are only possible if the electricity generation system has transitioned to clean energy. This dependency amplifies the impact of any failure to transition our power supply to renewables.

[8] Programme for Government: Our Shared Future
[9] Draft Revised Wind Energy Development Guidelines December 2019
[10] https://www.iwea.com/latest-news/3180-blog-draft-revised-wind-energy-development-guidelines

Key Energy Considerations regarding offshore wind for the Chambers Ireland Network

Energy security is a principal concern for our membership

Sourcing our fuels from countries that are politically unstable imports political risks into our economy, we need to ensure that Ireland has a resilient energy supply which can sustain economic, social, political, and environmental shocks.

Wind – and in particular **Offshore Wind – potentially has an enormously positive role to play in sustaining our economic future, if we bring in effective regulations to support the industry's development.**

This shift to renewables will need to be married to a programme of energy security contingency planning that provide assurance that that should failovers occur, sufficient electricity supply remains available to the network.

Climate change

Climate change has become an unavoidable risk, and one with unbounded potential maximum costs - we cannot predict how much Climate Change will cost our economy. However, by shifting to renewably sourced energy we can reduce the damage to the environment which we are yet to do. Our geographic location, and with it the large area of the Atlantic which lies within our sovereign territory, will allow Ireland to participate in the European Union's de-carbonisation mission through the exportation of our excess watts. **Ireland has unfortunately delayed the readying of a**

regulatory regime which could facilitate the generation of offshore wind energy by a decade already, it is vital that we rapidly make progress in reducing our burden on the environment.

Competitiveness

Energy costs for Irish business were significantly higher in 2019 than for their competitor businesses in the other EU-28 states[11]. Given the large amount of available capital, the unprecedented low interests rates, the creation of the European Green Deal Investment Plan, **this is the best moment in time to build capital intensive infrastructure, such as offshore windfarms, had we the regulatory regime to nurture them**, and to do so while minimising the cost impact for the consumer.

Export opportunity

With secular and technological change inducing significant disruption to global trade, and with this process being accelerated by the Covid-19 crisis, the exportation of offshore wind-derived energy should be a key part of the government long-term economic strategy for the State. With numerous proposed changes to international taxation regime likely to have a marked impact on government revenues **there is a great opportunity for Ireland to benefit from supplying electricity to other European Union states at zero marginal rates**. Further, as the technology matures, Ireland has the opportunity to use excess wind derived electricity to support Hydrogen production which can also have the benefit of replacing the CO_2 emissions that heavy goods vehicles, home heating, and our current generation of gas turbines are producing.

[11] https://www.seai.ie/data-and-insights/seai-statistics/key-statistics/prices/

Regional growth and industrial development

While our domestic demand for electricity is largely focused on the Greater Dublin Area, the vast majority of our wind-derived energy potential will come from the more economically disadvantaged areas. This means that the wind sector creates opportunities with multiple, reinforcing, positive effects. The maintenance and servicing of offshore windfarms is both highly skilled and labour intensive. SSE's Beatrice field[12], off Scotland, is 588MW and will require 90 employees to maintain it through the 30 year+ lifespan of the windfarm. With the programme for government targeting 5GW of electricity generation offshore, ten of our coastal towns on the East and South of the country can expect to become the centres for jobs like these. Combining the high-multiplier regional effect and the wage levels associated with high skilled engineering work, offshore wind has the potential to breathe life (and hundreds of jobs) into these small, regional, towns.

When floating turbine technology matures, we can expect that the west coast will see ten times as many towns benefitting from the maintenance and servicing of windfarms. We also have a narrow window where it may be possible to upgrade at least one of our deep-water ports along the East or South of the country so that they can be the focus for the construction efforts for these new windfarms there. If we fail to commence the upgrading of an Irish port then it is likely that the construction of the windfarms in Irish waters will be conducted largely out of France, or out of an English port, with a double effect; firstly we will not benefit from the jobs that are associated with construction which will have an immediate impact on GNI*, secondly we risk not having sufficient infrastructure and industry to support the Atlantic windfarms once they commence construction in the post-2030 period. Thirdly we raise the expense of

[12] Beatrice Offshore Windfarm Limited project Socio-economic impact report, July 2017

construction in Ireland relative to other countries as Irish offshore construction will incur additional transport costs (from France) or political and tariff risks (England).

This absence of an Irish Construction base will gravely reduce the longterm economic benefits that will be associated with the wind-energy industry. **Offshore wind has the potential to transform the economies some of our most disadvantaged towns and regions, reducing the economic burden on our cities while also fuelling the growth of our economy.**

Consequently it is clear to the Chambers Ireland network that this island needs an ambitious and immediate programme of action from the government to ensure that the Marine Planning and Development Management Bill is quickly passed, the Marine Spatial Planning Framework needs to be rapidly finalised, a strategy for maximising the economic and social benefits of offshore windfarms has to be developed, a skills and apprenticeship training strategy to support offshore construction must be introduced, quays will need upgrading to support crane activity and the weight of larger offshore wind turbines, logistic hubs will need to be developed, and ports will need integration with the rail network.

Constraints to the Wind Energy sector in Ireland

Time

Chambers Ireland is aware that there are a number of limiting factors to our capacity to benefit from our national wind resources. Time is the principal constraint upon the decisions that surround Offshore Wind Energy Production in Ireland. We are meeting our 2020 emissions targets only as a result of the decline in economic activity resulting from the last recession.

Had we been able to commence the development of offshore windfarms over the last two decades, the fines that we will pay over the coming years would be considerably reduced. Given the time it takes to bring offshore windfarms from planning to power generation, it is unlikely that our current situation will be much improved before 2027. **This makes the next three years critical in terms of progressing towards meeting our agreed 2030 emissions targets.** And further, given that as a consequence of the European Green Deal, our targeted emission reductions are likely to become much more ambitious, we will need to work even harder if we are to be successful in meeting these new lower emissions targets.

It is essential so that existing projects which are ready to commence are fast tracked so that they can start producing electricity at the earliest opportunities, while those projects that have been stalled as a result of uncertainties regarding the legal regime will have sufficient certainty over the medium and long run so that they can make good on their present outlay and be able to plan for the enormous efforts that are to be made between now and 2050.

Given that planning is one of the greatest risks in any infrastructural development, this means that if we are to meet our 2030 targets, we will need to ensure that maximum use is made of our existing infrastructure, rather than relying on new transmission infrastructure.

Regulatory certainty

The next major constraint is regulatory. We look forward regulatory regime quickly producing certainty for wind energy developers. This sector has been operating in a legal lacuna over the last decade during which the Marine Area and Foreshore (Amendment) Bill (MAFA) was commenced but failed to withstand legal scrutiny. In the absence of primary legislation, the financial commitments that the offshore sector needs can not be sourced.

Many developments, which were to have been built by 2020 had to pause because of the failure to deliver an effective planning system for the offshore sector. Work on the planning of other windfarms had to go into a hiatus until the parameters of the new legal environment were made clear. Unfortunately, the absence of legal and regulatory certainty continues to be the case. Many of those companies which wish to commence work in Irish waters have considerable sunk costs associated with the research and planning for their projects.

As we finally build an effective regulatory framework for facilitating the construction of offshore windfarms, and the landing of their electricity, we ought to be careful not to undermine the investments that have been made to date. Doing so could discourage further investment by those that are already active in Irish waters. Worse, it would raise further regulatory risks for those others who are considering investing in Irish offshore wind. Potential investors to the Irish market have already seen that those that took risks while there was regulatory uncertainty have suffered as a result of MAFA Bill's constitutional issues and slow progress towards remedying these legal problems. Should the new legislation prove to be ineffective, inoperable, or unfair to those that had faith in the Irish planning system, this would have an egregious effect on the reputation of Ireland as a home for green investments.

Grid capacity

There is currently, according to EirGrid, capacity to introduce 1.5 – 2 GW of wind energy along the East coast, and government has expanded from the Climate Action Plan offshore wind target of 3.5GW to 5GW over the 10 years to 2030. This means that we will need to use our existing grid infrastructure efficiently if we are to have sufficient capacity to be available to land all the potential offshore generated electricity. Changing the grid has proven to be a difficult task within the confines of Irish planning law.

Repeatedly, grid upgrades, even those that would benefit the local population, are resisted which extends the time taken in planning considerably. This has increased the cost of planning significantly as now projects must budget for the inevitable judicial reviews. While a survey of the Southern grid has not yet been conducted to determine what the available extant capacity is, we know that there will need to be considerable grid reinforcement if we are to be able to bring 5 GW onshore in the coming years.

There are also structural restraints, e.g., Dublin is the home of the largest demand for electricity but trying to route lines through the city is very slow and difficult, involving as it does a complex environment, historical built heritage, and a large number of landowners and occupiers. Alternative routes around the city are often congested with limited capacity to add new lines into the network. We must ensure that there is not only capacity for the planned 5GW of offshore wind that is to be built over the next ten years, we must also ensure that there is sufficient capacity for the 5GW of wind sourced electricity will be gathered from our Eastern and Southern Coasts in the following decade.

ESB Networks and EirGrid are tasked with a very difficult challenge; to support the connection of all the 'Relevant projects' within the Maring Planning and Development Management Bill , to allow for the connection of a number of other projects which have yet to be finalised while they are awaiting regulatory certainty; to support the connection of a further 5GW in the Eastern and Southern grid beyond the defined 'Relevant projects'; to do so with the minimum amount of onshore works to avoid the delays that are inevitable as a result of the planning system; to ensure that as much of

the existing infrastructure is used to capacity thereby minimising the public service obligation that billpayers will be faced with. And to do so even as the Celtic Interconnector is introduced, a further 4GW of onshore wind in connected to the network, while the North/South Inter-connecter is being been laid, as the supply of stable energy to the network will be reduced as some of the thermal plants on the network are decommissioned. The costs of these works will ultimately be paid for by the consumer, and given that these works must be completed quickly, the price of electricity is likely to rise further than was necessary (relative to a baseline environment where a functioning offshore planning system was introduced during the last decade). These regulatory delays now mean that we are in a race to meet our 2030 targets.

Observations on Marine Planning, Zoning and Setback Requirements

Setback requirements should be summarily rejected as parts of the National Marine Planning Framework. The premise of having a nearshore setback is mistaken as it reifies the principle that people can object to the mere sight of a wind turbine. Any form of token setback would set a precedent which the proposed Environmental and Planning court would have to consider in future planning objections.

Setback is an acceptance on the part of the state of the claim that no one should have to bear the toll that is seeing a turbine at sea. At sea level the horizon is at a distance of 5km which means that any turbine constructed within that field will be wholly in view. Distancing them further from shore does not protect the casual observer from viewing them out to a distance of 30km, and someone seeking them on the horizon can observe turbines out to a distance of 40km, by night or day[13]. On a clear day it is possible to see Wales from Wicklow, we will just have to accept that if we are to have turbines at sea, they will be seen.

Those few who will object to sight of turbines at sea will likely object to these projects regardless, we must ensure that while their concerns are heard within the planning system, if legitimate, they are balanced against the public interest necessities which also have legitimacy. If we are to reduce our CO2 emissions, as we must do, then we need to have alternative sources of electricity production. Offshore wind is one of the only viable alternatives, given our geography, but that needs a planning process which is robust. This will require planning officials that are suitably competent and expert, to ensure that the decisions made can withstand the inevitable judicial scrutiny which will be brought to bear on these projects. Therefore, a strong framework, that integrates planning, environmental concerns, and legal processes fairly has to be the highest government priority over the coming months.

[13] Robert G. Sullivan, Leslie B. Kirchler, Jackson Cothren & Snow L. Winters (2013) Research Articles: Offshore Wind Turbine Visibility and Visual Impact Threshold Distances, Environmental Practice, 15:1, 33-49, DOI: 10.1017/S1466046612000464

Setback undermines these climate action aims as the areas where it is easiest to build offshore windfarms are shallow, and the vast majority of shallow waters are near land, therefore restricting the building of offshore windfarms in nearshore waters reduces the area available for windfarm development by an order of magnitude.

With regard to the Marine Planning framework in general, officials ought to be appropriately conservative on what they hold their role to be. The department of planning has traditionally had few marine resources to consider, and so few who are expert in the marine environment. Some proposals suggest that the Department would review the available waters and then determine which areas have waters where offshore windfarm construction would be permissible, then developers would (by whatever process) contest for right to build within the allowed zones. Given the specialist skills that are required to establish whether an area is suitable for offshore wind development, and given the limitations of the existing grid infrastructure, then the planning system ought to consider only those projects for which proposals are submitted in order to avoid overloading the capacity of the planning system which would create bottlenecks that would prevent Ireland meeting the revised 2030 targets.

Chambers Ireland argues that default ought to be that, outside of maritime navigation channels, our militarily sensitive waters, and absent any peculiar ecological or environmental sensitivity at the site, then the construction of offshore windfarms ought to be permitted by default.

Again, it is inevitable that all proposed windfarm projects will suffer from planning objections. It is wiser to create a planning system that is sufficient to the task of passing a judicial review than it is to think we can avoid these judicial reviews by creating a planning system which inadvertently makes offshore windfarms unviable in an attempt to reduce the likelihood of the judicial reviews which are unfortunately inevitable.

An able planning system, and an Environmental Planning court which has dedicated judicial resources will be far more effective at delivering infrastructure development than an attempt to avoid inevitable judicial reviews.

Offshore Grid Development Policy Observations

In the short run, the clear necessity is for a Grid Development model that delivers the 5GW of offshore wind energy which we will need to meet the 2030 targets. To accomplish this all parties will have to work closely together and commence action immediately.

Thus, a developer led model should be the default option for wind energy projects along our Eastern and Southern coasts, unless the project in question would at a particular location prohibit the integration of other projects which are further down the development pipeline because of limitations to the existing grid network.

Where such a conflict exists a developer, in collaboration with the Transmission System Operator and ESB Networks, should construct an offshore substation which has excess capacity beyond what is necessary for their windfarm and so ensure that the substation is of sufficient capacity to support the reinforcement of the existing grid, or would allow for the connection of further windfarms, or offshore substations, that are needed to ensure that our 2030 targets might be met, while also minimising the number of planning permissions that would need to be sought on land.

This could of course be burdensome for the developer and so the Transmission System Operator should be obliged to finance the additional costs that are incurred with these works to ensure that the primary developer is not unfairly burdened by the costs of developing new infrastructure which its late-moving competitors would be able to use without incurring similar costs (thereby putting them at a competitive advantage). Without burden sharing between the state and the developers regarding the cost of this necessary infrastructure then first movers could be discouraged from commencing construction works.

Such a process would, in the longer run, be of benefit to the enduring regulatory regime which would exist out beyond 2030, as it would allow, in parallel with the construction of an offshore windfarm industry, the development of the skills needed to design, maintain, and upgrade an offshore grid infrastructure. This would have the potential to

allow the Transmission System Operator to upgrade and reinforce the onshore grid without needing to engage with the onshore planning system, (and the delays which onshore infrastructure involves). It could also allow the grid owner to build up the capacities and skills that will be required to support the eventual export focused offshore grid which will transport our excess electricity to continental Europe.

These skills would be useful if, as most stakeholders (including Chambers Ireland) believes, that it would be best to have the long run Grid Development policy more wholly integrated into a plan led model. The constraints on the Western Grid are different from the Eastern and Southern – primarily it is the absence of grid infrastructure which is the problem rather than the challenges of upgrading existing infrastructure. With the exception of Moneypoint, offshore connections will be possible into the West without significant onshore investment in the grid. This is a process that must also commence immediately, as individual grid upgrades often roll out over a duration measured in decades, in the Irish context.

However, even under the long run model of planned offshore grid development it will be necessary for the Transmission System Operator to work with the developers to identify the appropriate offshore sites as even by 2030 it is unlikely that the Grid owners and operators are not likely to have experience in the actual construction of offshore windfarms; merely with configuring the onshore grid to support their connection. The Transmission System Operator may not be well placed to understand where the appropriate locations for windfarms might be. It will be capable of outlining how the grid could be extended and reinforced to facilitate the construction at particular sites, and how long that was likely to take, and map our potential development pipelines. Together this would allow the Transmission System Operator and ESB Networks to collaborate with the developers to maximise the production of electricity, while operating under the TSO's and the developers' resource constraints.

Therefore, in the long run the department should aim to create a regulatory regime that is directed by collaboration between developers and the Transmission System Operator rather than one which is overly centrally planned. There should be a plan, but it should

be reasonable, coherent, and be flexible enough to accommodate the political, local, and legal difficulties which are part of the infrastructure building process.

Environmental impact of offshore wind

Environmental impact should be an important driver of the consideration of any and all planning decisions, and care should be taken to ensure that construction doesn't occur in sensitive areas nor at sensitive times, but it should also be recognised that the environmental impact of not building a windfarm should be included in the weighing of a decision on the environmental impact of a given project. Every project should involve an environmental impact assessment, which ought to consider the positive environmental impacts as well as the perceived risks. Typically, while the construction phase is ongoing marine animals are disturbed by the activity which is occurring but returns to normal after that phase has been completed.[14]

As a result of the fishing exclusion zone around the windfarm, there is typically a habitat gain[15], with the areas where turbines exist becoming de facto marine wildlife sanctuaries[16] while there is known damage that windfarms do to flying animals, it is primarily an effect which occurs in tandem with migratory events suggesting that for the vast majority of the year there isn't a negative effect. And during those periods where there is a negative effect, the rotation rates of the turbines can be down regulated to minimise the consequences, or in combination with radar the turbines can pause their rotation to allow the passage of a migratory flock. The greatest effect on the area local to the windfarm is during the construction phase, which should look to compress as much activity into as small a temporal window as possible, while remaining offsite during the breeding phases of any vulnerable species that breeds in the area.

However, if the area is currently suffering from trawling disturbance, then the area is likely to benefit from the protections that the exclusion of fishing[17] and commercial

[14] **Assessing environmental impacts of offshore wind farms: lessons learned and recommendations for the future**
[15] Effects of offshore wind farms on marine wildlife—a generalized impact assessment
[16] Marine Renewable Energy in the Mediterranean Sea: Status and Perspectives
[17] Short-term effects of fishery exclusion in offshore wind farms on macrofaunal communities in the Belgian Part of the North Sea

vessels, particularly if accompanied with anti-scouring protections that simulate reefs and support the re-colonisation by local species of diverse habitats[18].

Future proofing the offshore grid

Chambers Ireland does not have a view regarding the technical solutions that are appropriate for the developers, Transmission System Operator, or grid owner. However, we are concerned that the grid be utilised effectively, efficiently, and to its fullest extent, as under-utilised capital stock still has to be maintained and so stranded assets would drive up the already high price for electricity which the Irish consumer must pay.

While we believe that the near-term marine planning system should be developer led, we can foresee how that could exacerbate congestion, and how this could easily become an issue in the already congested Eastern grid. Therefore we believe that, in consultation with the regulator, if the Transmission System Operator is able to make an argument that to maintain the long term sustainability of the grid it is necessary to use the and a model that is planned in consultation with the Transmission System Operator ,then the Transmission System Operator ought to invest in the local Grid infrastructure at that location through the mechanism of determining what the upgraded requirements for a line, a substation, or whatever other grid technology is involved, must be at that location and compensate the developer sufficiently to cover the cost of upgrading the grid infrastructure beyond the capacity which is the immediate requirement of that developer.

Social acceptance

Social acceptance is unlikely to be derived from the model of Offshore Grid Development which is applied. Social acceptance is a process that takes time, and only after the change has occurred.

[18] Artificial Reef Effect in relation to Offshore Renewable Energy Conversion: State of the Art

The most important thing that the Department can do is to ensure that the process that it prescribes is sufficiently robust, and the institutions involved are sufficiently capable to ensure that when these projects do pass through the inevitable judicial review, then they will succeed as they will have been conducted fairly with adequate concern for all the relevant interests, within the confines of well-articulated legislation.

There has been some discussion regarding the possibility that the presence of one single entity which rolls out all the grid infrastructure across the country might lend itself to a more easily attained social acceptance, this is probably very unlikely – given the long history of planning activism that is part of the civic process.

Arguably, a developer that finds themselves building offshore infrastructure and which cannot profit from their investment until the connection is made to the grid is both better incentivised and has more degrees of freedom in its engagement with a local community, when it comes to making a deal – compared to a state body which may find itself in the midst of a political controversy over its construction of grid infrastructure.

Timeliness

The opportunity for timeliness has passed. There is perhaps a 24 -month window to ensure that we are progressing towards meeting our 2030 targets. The default strategy, Chambers Ireland has argued, should be to build all the relevant projects, and all others that are necessary to meet the 5GW targets, under the developer-led model of marine planning – unless such a course of action may prove to be limiting to the capacity of the grid to deliver on that 5GW transmission target

Economic opportunities in developing an indigenous offshore wind energy industry

The development of an indigenous offshore wind energy industry is critically important to the future economic prosperity of the country, not least because the likeliest location of the port that will be used for the construction phases of the windfarms that are to be built on the Eastern and Southern coasts of Ireland is Liverpool. Our delay in creating a robust and constitutional

regulatory and planning regime for offshore windfarm development has resulted in Ireland losing significant opportunities in the offshore wind electricity generation sector already.

However, Brexit may be of benefit to Ireland in this circumstance, as Britain moves from the Customs Union there is likely to be regulatory, tariff, and certification issues involved in the exportation of finished goods, such as a wind-turbines, into Irish territory. This could allow for Irish companies to have a competitive advantage relative to Britain, which is likely to be hindered by its trade designation for a considerable period.

There is also a degree of certainty to be attained, even with matters as simple as currency, never mind political risk, or the risk of divergence in labour standards, and the problems regarding cumulations and certificates of origin for products that may be complicated for a product delivered at a significant distance from shore.

Beyond rapidly passing the Marine Planning and Development Management Bill, the most important thing that can be done in the short term is the selection of an Irish port which can act as a hub for the Irish indigenous offshore wind energy construction sector, which could, as part of the European Green Deal, upgrade its facilities to ensure that it is capable of delivering the services that Irish entities will be borrowing billions of Euro to invest in.

It is critical that we move immediately on such a port, as not only will it be useful in the construction of the 5GW out to 2030, but because it will create the skill base, the knowledge base, the expertise, and the personnel which will be needed to deliver on the promise of offshore wind out to 2050 and beyond.

Aside from the construction industry, the operation and maintenance phase of these windfarms has the opportunity to transform regional coastal towns given the scale and quality of employment involved, and more so because of high investment multiplier effect that we can expect in regional towns because of the current low demand for employees.

If SSEs BOWL project in Scotland is a model that can be replicated here in Ireland, we can expect as many as 20 towns along the Eastern and Southern coasts re-enervated by the Operations and Maintenance requirements of approximately 10GW of Windfarms over the next two decades. Estimates that relate to the Atlantic coast range between three and five times that number. Such activity, particularly if coupled with a second construction port on the Western coast, would

create the potential for developing an oceanic energy industry cluster. This could also serve as a test bed for an indigenous wave-energy industry into the future too.

Reducing the cost for consumers

While the members of Chambers Ireland desire a lower rate of costs for consumables such as electricity, we are also aware of the need to maintain and upgrade our grid infrastructure. Ireland is a high-cost economy, and high-cost electricity limits productivity, but the costs are felt the greatest when construction and investment is limited because there is an absence or deficiency in our supporting infrastructure. Investment in Ireland is more likely to be limited by the potential insufficiency of supply of electricity than it is by cost, and insecure supply would be more limiting still.

Long-run grid delivery model

In the pre-2030 period the Chambers Ireland View is that we should be using a developer-led model wherever possible unless that would undermine the utility of our grid infrastructure.

The post-2030 period will see us having used up most of the easily accessible sites on the eastern and southern coasts, though some may still exist. The gains post-2030 will be found in the Atlantic, which will require significant additional new infrastructure if that energy is to be made accessible. That should involve a centralised approach, however it is the developers that will have the technology, the skills, the research, and the experience to build significant pieces of infrastructure offshore, so while the onshore ought to extended by normal means, the offshore connections themselves should be built by the developers to the specifications of the Transmission System Operator and ought ultimately be owned outright by the grid owner.

Regarding the costs associated with the upgrading of grid infrastructure to support low carbon technologies

The Chambers Ireland support for the investment in the national grid infrastructure is driven largely by our commitment to climate action. It is critical that our country move

towards a means of living and doing business that is sustainable. Part of the reason why we have taken the decision to support the Sustainable Development Goals is because the damage which carbon-dioxide emissions are doing to the environment has become apparent. The most obvious damage to our environment has been in the altered systems, and extremities of weather that we are now experiencing all too frequently.

While the direct cost that consumers will face is important, far more concerning is indirect costs associated with both climate change, and the potential for Ireland to miss our new revised EU 2030 targets arising from either a failure to adopt, or the slow adoption of, Low Carbon Technologies. It is the Chambers Ireland network's fear that deficiencies within the existing networks, and particularly the Low Voltage networks, have the potential to slow the pace of the adoption of the new Low Carbon Technologies that will be needed if we are to meet our emissions targets. In the worst-case scenario, the lack of capacity with the Low Voltage networks my prevent our decarbonisation from succeeding.

Chambers Ireland Perspective on Local (Low Voltage) Networks:

Chambers Ireland sees under-investment in the Low Voltage network as a key threat to facilitating a secure low carbon future as it risks undermining social acceptance of the need to invest in new technologies.

We also see that the Low Voltage network is a risk to resolving local security of supply, beyond the Dublin region in regions which will have may have lower capacity and greater likelihood of demand for Low Carbon Technologies, particularly given the likelihood that most electric vehicles will be based outside of urban environment.

Furthermore, we see that the best way to succeed at increasing efficiency and protecting customers is to ensure that investments in smart control systems are carried out with alacrity to ensure the investments will over the long run have the minimum present expected value.

Upgrading the existing resources of the grid with smart control technologies will be the best way to ensure that the grid which supports consumers is as efficient as possible.

Making the best use of our existing infrastructure is the very first step in supporting energy efficiencies, not only will using smart control technologies maximise the benefit that consumers receive from those assets, it will also ensure that we are using the energy that is on the grid in the best way possible which will also result in reduced use of fossil fuels because the fine degree of control that smart power distribution technologies facilitates ensure that the most can be made of each Watt that is placed on the grid.

The case for front loading capital investment plans

In terms of the timing of investments, Chambers Ireland believes that it behoves all state bodies to accelerate their capital investment plans, given the current economic circumstances.

These circumstances have created a unique set of circumstances which amplify the efficiencies of capital investment in the short run relative to longer run scenarios.

With the cost of capital currently much reduced, relative to historic norms[19], it is unlikely that we are ever see capital available, with such a low cost and with such great supply, again.

There is considerable uncertainty regarding how long these circumstances might last, given the wider public health and economic circumstances that we are living through. It is worth recalling that that the present rates which the Distribution Systems Operator (DSO) can gain access to credit at is contingent on the maintenance of these historically low rates.

As a result – and beyond the public service argument which suggests that capital investment plans should be accelerated where possible in order to minimise the double impact of the Covid-19 economic slump on the domestic economy and the Brexit risks to our trading economy – there is an argument for delivering as much investment as possible in the short run while it is possible to lock in the benefits of these historically low rates that we are currently experiencing.

The postponement of such capital investment risks the possibility that these necessary works, when they are inevitably carried our (including work such as the smart grid investments, and the Low Voltage network reinforcements where there is minimal existing marginal capacity etc.) will have to be implemented with much higher associated financing costs.

Secondly, as a direct result of the Covid-19 slowdown, we have already seen a marked decrease in demand for construction, something that we expect to see worsen over at least the coming years.

[19] Since July 2020 Irish Government bond yields have been negative out to 15 years
http://www.worldgovernmentbonds.com/country/ireland/
https://tradingeconomics.com/ireland/government-bond-yield

Therefore, with the existing low cost of capital and the reduction in construction costs, this is the moment when making progress on the implementation of infrastructure will have the lowest economic costs, thereby increasing efficiency and protecting customers.

Investing in the grid

Chambers Ireland knows that considerable investment will be occurring in our Electricity Supply networks over the coming years which is to be both commended and welcomed. Many of our submissions to government have been calling for such investments to develop, upgrade, and reinforce our national grid.

We however have two areas of concern regarding the scope of the allowable investment plans as they currently exit.

Firstly, there are enormous risks associated with insufficient capacity at the Low Voltage networks. This lack of capacity could seriously hinder Government policies that aim to support the reduction in carbon emissions. Secondly, there is a lack of ambition for the opportunities that smart control systems can have upon the efficient utilisation of existing and planned infrastructure.

Both sets of investments, along with the other planned investments which are already in the pipeline, are constrained by the time that is available to implement them. The Low Voltage system upgrades will not scale well, as they are labour intensive, and so risk hitting an investment cliff closer to 2030 when labour supply constraints will increase the costs of implementing these many small projects across the geographic expanse of the network.

Conversely, with the smart control systems, the earlier the investment there, the less we will need to invest in the long run. Initially because we will not have to have as much High Voltage Network capacity (because we will be using what we already have better), but also because we will not have to retrospectively return to the investments which we

are currently putting in place in order to integrate technologies which could have been put in place during the currently ongoing construction.

These Low Voltage and Smart grid investments should occur at the earliest opportunity.

Boosting Low Voltage network capacity

In the coming years, the goal must be to use our resources as efficiently and effectively as possible. Our sense, as a network, is that local Low Voltage network capacity must be significantly upgraded if it is to support the technologies which are key to the transition to a low emissions economy.

At the Low Voltage level this will require many small, but labour intensive, pieces of work which would be best spread out more efficiently over a longer timeframe, rather than attempting to crowd them into the last two years of the next Price Review cycle, because that will likely see demand on these Low Voltage systems outstrip their capacity constraints in many locations simultaneously.

This is a particular concern because a huge amount of investment is already needed on the High Voltage networks to support both the landing of 5GW of offshore electricity by 2030 and the expansion of the onshore windfarm fleet by a further 4GW. Significant investments will be needed to create capacity for the relevant projects on the East coast during the Price Review 5 period, and it is our understanding that the capacity development plan for the Southern grid has yet to commence, though that too will need to be delivered upon during the 2025-2030 period.

Crowding further investment into a period which we already know will be congested, in terms of infrastructure development for our electricity networks risks fostering inefficiencies.

Even before much of that work begins in the late 2020s, the Price Review 5 period will also see considerable investment occurring to support the creation of a domestic solar

generation industry, the connection of microgeneration systems to the electricity network, and creation of community energy schemes.

Simultaneously, we can expect major changes to consumption patterns. Some, such as working from home should have smoothing effects on demand but may increase the base demand in areas which would not ordinarily have high levels of demand during the day, meanwhile the integration of new Low Carbon Technologies into our lives, such as heat pump and electric vehicles, will see localised step changes in demand which will have a deleterious effect on local security of supply unless those networks are appropriately reinforced in advance.

Retrofitting will be an important strategy for both commercial and residential properties. The likelihood is that these investments will need to be accompanied by microgeneration technologies (if they are to be viable investments).

This will require that local Low Voltage and Medium Voltage networks which are capable of absorbing excess electricity for these networks, which will have to be matched by commensurate changes at the high voltage supply levels that will require a fine degree of centralised control of the supply network – placing large demands on the IT infrastructure for both the Distribution System Operator and Transmission System Operator.

For the wider community, community supply schemes which can spread both the benefits and costs of domestic microgeneration are likely to be an important part of gaining social acceptance and so will need considerable Distribution System Operator support if they are to succeed.

There is acceptance across our network that investment will be needed to support this transition to a greener energy grid, however these investments must be accompanied by the certainty of security of supply if that acceptance is to be maintained.

Already our member chambers are fielding questions from businesses which are planning investments in electric vehicles that arise from their concerns about the

capacity of their local networks to support the high demands that these vehicles will place upon them.

A feature of the last few years has been the difficulty of onboarding new onshore wind energy onto the network as a result of capacity restraints. Over the coming years we will see a doubling of the size of the onshore fleet, the creation of an offshore fleet, the creation of a new solar generation industry, and a microgeneration industry. The connection delays that have been present over the last number of years cannot continue into the future.

Making smarter use of our supply infrastructure through microgeneration

These investments in the Low Voltage networks will have to be accompanied with a parallel strategy that will upgrade the smart control systems at the High Voltage network level which will make sure that best use is made of the existing grid infrastructure.

Consequently, we were disappointed with the shortfall in allowable operational expenditure on the part of the Distribution System Operator to cover the changes in the underlying business model.

It is unclear what form microgeneration may take, how many forms it may take, and in which parts of the country it will achieve greatest penetration: For some people it may make sense to for them to allow their PeV generated electricity to spill over only the local network without involving a commercial element; Community schemes may operate to disburse the cost of investment across the community where there is variable availability of renewable resources; It is not clear how apartment blocks will manage the electricity that can be generated with their buildings. The Distribution System Operator will be tasked with facilitating a wide variety of such schemes and iteratively improve them as learning develops within the Distribution System Operator, within the business community, and within the wider community.

The Distribution System Operator ought to be able to facilitate the diverse set of likely ways communities and organisations can choose to engage with these novel technologies and arrangements. Without the capacity to experiment across diverse arrangements there is a risk that the Distribution System Operator will be forced into creating a one size fits all offering which is ultimately sub-optimal as it may not effectively energise communities to engage with microgeneration.

2020 – 2030 will be a time for trial for experimentation, and sometimes for error, and that is to be welcomed. We cannot be certain as to what precise route will be necessary to get ourselves to 500MW of microgeneration and beyond but it is unlikely to be as generous to the generators as the German and British models (given the equity concerns). Therefore, microgeneration is likely to be integrated into the community bundling of the Just Transition projects, a novel process that raises concerns about utility of copying what has been done abroad, and facilitating only what has been put in place elsewhere.

Without allowing communities to discover the solutions that suit them, there is a risk that microgeneration will not gain the foothold it needs if it is to become successful.

This flexibility will not come without a cost, and that is to be accepted, however the counterfactual would be a failed programme to implement microgeneration which would have its own efficiency risks for the grid.

And this is only when we consider microgeneration, the Distribution System Operator will need to significantly alter many elements of its core business as we come to understand what facilitating a secure low carbon future means, and this is going to come with significant demands upon the permitted OpEx.

With smart metering new products will be developed; electric vehicles; data centres: heat pumps; hydrogen electrolysis; biomethane schemes etc. will all have unique elements and interactions that will need significant efforts on the part of the Distribution System Operator if these products, services and technologies are to be accessible to the public.

It is hard to see how the Distribution System Operator will be able to achieve these demands that are being placed upon it withing the allowable OpEx constraints that the Commission for Regulation of Utilities is placing upon it.

If these tasks are not delivered upon, then considerable areas of government policy around renewables will not succeed.

The threat to the social acceptance of these novel low carbon technologies

The worst-case scenario, in terms of social acceptance, is that individuals or businesses will invest electric vehicles, or deep retrofitting with heat pumps, only to discover that these technologies will make their local electricity supply unstable.

This points towards the need for the immediate upgrading of our Low Voltage and Medium Voltage networks where necessary. Concerns about the capacity of local networks capacity to withstand the integration of high-demand Low Carbon Technologies already exist. It would not take many instances where problems occurred to undermine the government policy is these areas.

As is, between now and 2030 government targets demand that 400,000 heat pumps and 1,000,000 electric vehicles will be adding to the network. A further 500MW of microgeneration is expected to be connected during the same timeframe. This will require an enormous amount of accompanying private investment, with uncertain returns.

If these investments are going to be made, they will need to be de-risked as much as possible. An essential element of de-risking these investments will be ensuring that sufficient local grid capacity exists to ensure that there are no cases where these investments are kept off-grid while the local Low Voltage network needs to be upgraded.

If supply capacity is overwhelmed by the introduction of these new technologies, then this will see the neighbours of those who are making the investment bear extraordinary costs while awaiting the upgrading of their local network. This will create considerable resentment towards the network, towards the investor, and towards the technologies.

Similarly, if businesses or individuals have invested in microgeneration technologies and limitations on their local networks mean that this will not generate the revenues that had been expected for that technology, then they risk undermining the funding and financing of other investments that may be made – either the investors themselves will defer future investments until they can be certain that the microgeneration revenue system is working smoothly, or those financing the investments may deem them unviable because these earlier projects had not generated the expected returns.

To avoid these scenarios, it may be necessary for those investing in these technologies to assess whether their local network may be able to absorb the extra supply or demand that these Low Carbon Technologies place upon the Low Voltage network. This will put the Distribution System Operator in the invidious position of becoming the gate keeper, or at least bottleneck, that controls the integration of these new technologies – with huge reputational risks attached.

This also risks that government targets may not be met because the upgrading of local capacity has been delayed.