ESB Generation and Trading Consultation Response: Consultation to Inform a Grid Development Policy for Offshore Wind in Ireland

22/07/2020

Contents

1. EXECUTIVE SUMMARY

ESB Generation and Trading (ESB GT) welcomes the opportunity to respond to the Department of Communications, Climate Action and Environment's "*Consultation to Inform a Grid Development Policy for Offshore Wind in Ireland*".

The offshore wind grid development connection policy will have much wider implications than just enabling better offshore and onshore grid planning. The chosen grid delivery model will have strong impacts across the entire wind farm value chain, down to how projects will be finally awarded a route to market. Accordingly, the model will have a strong influence on the future success of Ireland's Offshore Wind Sector.

In addition to answering the questions posed by the consultation, ESB GT wishes to promote two excellent opportunities for DCCAE to both accelerate the Irish offshore sector and maximise its long-term potential. Specifically, ESB GT recommends the creation of a new class of Offshore Wind Project, Offshore Wind Projects with Hybrid grid connections[1] and the acceleration of floating offshore wind off the west coast of Ireland.

ESB GT believes that none of the grid delivery models as presented in this consultation are completely compatible with reaching the 2030 target. The time commitment required to enact the MPDM Bill, develop a new OREDP, and undertake zone selection would push all prospective projects past the 2030 delivery time horizon. We recommend that an interim streamlined approach prioritising most straight-forward grid connections should be progressed to enable a project pipeline capable of delivering on this ambitious goal.

Additionally, ESB GT strongly advocates that policy and regulations covering the grid connections associated with existing thermal generation stations should be amended so that a grid connection can

[1] ESB GT defines Hybrid Offshore Wind (HOW) as an offshore wind project which shares a grid connection and Maximum Export Capacity (MEC) with an existing thermal generation plant from the same legal entity. In doing so, it obviates the requirement for planning and construction of additional major onshore grid infrastructure by utilising existing grid connections. Both the thermal and offshore wind assets would be managed and traded to maximise the use of the MEC of the original generator.

accommodate the co-location of both existing thermal generation and offshore wind generation, creating a new class of grid connection called Hybrid Offshore Wind. These policy and regulatory changes should be enacted as soon as possible to enable the developments of Hybrid Offshore Wind projects at appropriate sites in parallel with and with the same urgency and pace the progression of the Relevant Projects. These changes will unlock access to significant additional grid capacity with very little requirement for additional infrastructure. These connections and associated projects would not require additional deep reinforcements, thereby decoupling the delivery of offshore wind projects from delays in onshore grid development and construction, the biggest delivery risks to Ireland's 2030 renewable energy targets.

The offshore grid connection policy to support more long-term deployment of offshore wind should look to support the unlocking of the potential of Ireland's vast coastline. ESB GT recommends the adoption of a grid delivery model adapted from the four models proposed in the consultation. Our model proposition has a strong developer-led component regarding the core offshore wind farm delivery, generating greater competition between developers, and promoting innovation to drive down costs, leading to a more cost-effective solution. It then leans to a more plan-led approach for the planning, design and construction of the wider supporting grid infrastructure. We believe this is a stronger unification of the two approaches by harnessing their main strengths, allowing for a better development of the Ireland's offshore wind sector.

Developers have the experience and expertise in managing the risks (financial, technical and delivery) of the large investment required to develop projects to bring them to market quickly, efficiently and economically. In contrast, a highly prescriptive plan-led approach to generation development would require the establishment of a State Body to select sites, investigate those sites and deliver consents. Resources with the requisite knowledge, skills and experience in this area are in short supply and thus expensive. Experienced developers will have these resources in house to a greater or lesser extent whereas the State Body will most likely have to combine recruitment of experienced staff and the appointment of experienced consultants to deliver these milestones, ultimately an expensive and time-consuming option.

This extra time investment required to fulfil a plan-led approach across the entire offshore wind value chain would greatly delay projects and therefore reduce the number of projects eligible to enter upcoming RESS auctions, thereby limiting the sector's potential, and its ability to contribute to climate mitigation goals. This will have a negative impact on the level of competition in RESS auctions, undermining one of the core benefits of this scheme design. Ultimately, the customer will lose out on

potential savings that would be driven by competitive forces, both in the development phase and in securing a route to market. Recent auction results in the UK are a testament to the savings that can be accrued.

The transmission network is a critical national infrastructure, which will require deep grid reinforcements to facilitate not only the integration of offshore wind but also to enable greater electrification of the economy to aid the nation's wider decarbonisation. It is essential that the Government should ensure that the grid is developed so that 5 GW of offshore wind can be connected by 2030. The level of development required, and the associated delivery timelines demand considerable proactive grid planning. Therefore, ESB GT fully endorses a more plan-led approach to the planning and construction of deep transmission reinforcements, both onshore and offshore, to deliver a more optimised grid system in a manner which enables the delivery of all required 5 GW by 2030.

ESB GT completely supports the ambition for Ireland to become established as a world leader in the deployment of offshore renewable energy (including the development of associated local industry and skills) which we believe is a realistic objective and the grid connection policy chosen will be a key component in unlocking this potential.

GT strongly supports the acceleration of the deployment of floating offshore wind off the west coast of Ireland. ESB GT recommends that the government should set a goal to have at least one commercial scale floating offshore wind project in service by 2030 as it would signal Ireland's belief and ambition for floating offshore, would support jobs and enterprises operating in this emerging sector, and could serve as a template for further floating offshore wind projects in the 2030s. Floating offshore wind should be enabled through changes to grid policy and amendments to the design of RESS auctions, all of which will deliver long-term benefits for Ireland.

2. OFFSHORE WIND AND IRELAND'S LOW CARBON FUTURE

2.1 Climate Action and role of Offshore Wind

Developing a strong and sustainable Irish offshore wind sector provides a rare opportunity for the State to deliver on a wide range of central governmental policies, from delivering on carbon reductions ambitions, improved energy security, opportunity for export, to job and supply chain creation, and regional development.

Ireland's climate action plans are largely hinged on the nation's ability to rapidly scale up renewable generation, a considerable proportion being offshore wind. This will take a strong concerted effort to streamline processes and align key policies, including grid connection policy, the focus of this consultation. The opportunity for further onshore wind development in Ireland is constrained as suitable sites are not in plentiful supply, leaving offshore wind as the remaining renewable generation technology of significant scale. As such, offshore wind will play a central role in realising Ireland's ambitions and delivering on the 70% RES-E target by 2030. This was clearly appreciated within Ireland's Climate Action Plan, where a target of at least 3.5 GW of offshore wind was set out. Indeed, the newly formed Government now plans to increase this already ambitious target to 5 GW.

The urgency to support and maximise the opportunity for offshore wind is further heightened given the challenge to deliver the 8.2 GW target for onshore wind, both in terms of a technical challenge as there are limited remaining sites which must adhere to the new Wind Energy Guidelines when adopted, and the difficulty in securing social acceptance given the impact of onshore wind infrastructure on communities and the landscape.

2.2 ESB's Offshore Wind Vision

We believe that the development of offshore wind at scale is key to tackling the climate emergency with the potential not only to meet national but growing international demand for clean power. Our commitment to support this objective has been demonstrated firstly through ESB GT's investment in the Oriel Windfarm project located off the coast of County Louth in January 2019 and then more recently by entering into a development partnership with Equinor, a Norwegian-based energy company.

It is our ambition through this partnership to explore opportunities for large scale wind projects and to bring them to commercial operation by 2030 and beyond, thus contributing to the wider goals of the Irish Government on energy transition. We also believe that we can deliver a greater ambition by utilising our existing grid connections and generating plants to further the aim of reducing emissions. This vision and capability can be facilitated alongside the Relevant Projects through rule changes to

the terms and conditions to allow hybrid connections to participate in the Energy Market. Such an approach would drive great competition and better use of existing infrastructure.

This duality of purpose is especially important to ESB GT as we have a double focus – working to achieve the urgent 2030 ORE target which will primarily be achieved through deployment of “bottom-fixed” offshore wind turbines and preparing now for the future beyond 2030 when we believe that “floating” offshore wind technology will play an important role.

We welcome the urgency injected by reference to the new Programme for Government’s target of generating 5 GW of offshore renewable electricity by 2030. We also welcome the commitment to proposals that are more long-term, and which could provide strong economic growth for Ireland.

3. APPROACH TO A MORE STREAMLINED AND EFFICIENT CONNECTION OF OFFSHORE WIND

In this section ESB GT lays out what we see as the most optimal approach to connecting offshore wind farms that will not only ensures that 2030 targets can be met, but also enables better overall use of current infrastructure, facilitates greater acceptability by communities, and provides wider opportunity for local area regeneration across the whole coastline of Ireland.

3.1 Enabling Ireland to reach 2030 Offshore Wind targets

The Programme for Government has set a new ambitious target of 5 GW of offshore wind by 2030. This represents a very challenging target to reach, particularly given that offshore wind projects can take in excess of a decade to develop, and a large proportion of the offshore wind policy landscape has yet to be finalised.

There are two main policy aspects that must be focused on in order to allow this ambitious target to be met. Firstly, near-term development of offshore wind is completely dependent on greater grid capacity becoming available to allow projects to be connected. Irrespective of which variant of grid model is selected as the enduring model (the focus of this consultation), the current shortage of available onshore grid capacity will result in significant delays to the offshore sector. Even with the most proactive grid planning by the TSO, delivering reinforcements to accommodate projects in excess of the available 1.5 GW (as set out in Navigant report) will prove very challenging. Over the past decade, the timely development of the required transmission infrastructure has played a role in slowing the development of onshore wind. There is simply not adequate time to deliver these types of projects and this signifies the single greatest obstacle in delivering the 2030 targets.

It is imperative that every action is taken to ensure that we maximise the utilisation of the existing grid infrastructure, including facilitating hybrid connections to allow the greatest penetration of renewables. This approach not only allows quicker and more efficient connection of offshore wind but will ultimately reduce the cost to consumers and ensure the delivery of all seven drivers as set out in the consultation.

Secondly, a strong pipeline of projects capable of delivering these targets must be encouraged. Offshore wind projects are inherently risky, and these projects will be subject to RESS auctions to secure a route to market, so a level of attrition is to be expected. Therefore, a pipeline far in excess of the 5 GW target would need to be enabled near-term by both the grid policy and the wider policy landscape.

ESB GT believes that none of the grid delivery models as presented in the consultation are suitable pathways to enable either the required grid reinforcements or the project pipeline to meet the 2030

target. A more streamlined process should be followed for early developments to kickstart the sector and maximise Ireland's ability to reach the 2030 targets. An enduring model should be subsequently developed for later projects to ensure proactive grid planning as discussed in Section 3.2.

3.1.1 Hybrid Offshore Wind Connections

ESB GT has identified a unique opportunity to strengthen the prospective pipeline of projects while also helping to ease the grid delivery challenge and unlock a much quicker and cost-effective route to reach Ireland's 2030 targets. In fact, we believe that failure to expeditiously pursue this opportunity will make the 2030 targets unattainable.

ESB GT is strongly advocating that policy and regulations covering the grid connections associated with existing thermal generation stations should be amended so that the grid connection can accommodate the co-location of both thermal generation and offshore wind generation, creating a new class of grid connection called Hybrid Offshore Wind (HOW). These policy and regulatory changes should be enacted as soon as possible to enable the developments of HOW projects at appropriate sites. These projects could then be progressed in parallel and with the same urgency and speed as the Relevant Projects, significantly strengthening Ireland's offshore wind projects pipeline capable of meeting the 2030 targets. This change in policy and regulations would unlock access to significant additional grid capacity with very little requirement for additional infrastructure and would not require additional deep reinforcements. Accordingly, HOW projects delivery would be completely decoupled from delays in onshore grid development and construction, the single biggest delivery risk to Ireland's 2030 renewable energy targets.

ESB GT defines Hybrid Offshore Wind (HOW) as an offshore wind project which shares a grid connection and Maximum Export Capacity (MEC) with an existing thermal generation plant from the same legal entity. In doing so, it obviates the requirement for planning and construction of additional major onshore grid infrastructure by utilising existing grid connections. Both the thermal and offshore wind assets would be managed and traded to maximise the use of the MEC of the original generator. This would increase the degree of competition in the upcoming RESS auctions and in the energy market where the improvised diversification of generation would allow improved utilisation of connection points and assets.

This is a clear policy objective already set out in the Climate Action Plan, '*Facilitate additional hybrid connections operating in the electricity market to increase RES-E penetration'*. Our proposal seeks to simply expedite these existing plans. HOW connections should be prioritised within this process and supported with greater resources in order to expediate their use by offshore wind projects. This will not only enable the most efficient use of existing infrastructure but would reduce the commissioning time

of offshore windfarms by many years and reduce the requirement for unnecessary and costly grid reinforcements. In addition, HOW grid connections would reduce disruption to local communities, and they would minimise the impact on the environment.

ESB GT sees this as the natural next phase in the evolution of the electricity system, facilitating new technologies to be adopted whilst still maximising the use of existing transmission infrastructure, providing the best value to the end consumer.

The East coast study by EirGrid, suggests that there is currently 1.5 GW of grid capacity available for the connection of offshore wind without deep reinforcement. The remaining Relevant Projects and new projects will have to wait for extensive grid reinforcements to be completed, greatly risking their ability to meet targets in time. HOW grid connections could add at least 2 GW of additional grid capacity (with the potential for a further 1.5 GW) for the connection of offshore wind projects. ESB GT's offshore development team has developed representative delivery timelines in Figure 1 for the different project classes to demonstrate their ability to meet the 2030 deadline. It can be clearly seen that HOW grid connections would greatly accelerate delivery of projects. These projects could be delivered 5 years in advance of their new project counterparts due to their existing grid connection, and more importantly within a comfortable margin of the 2030 target.

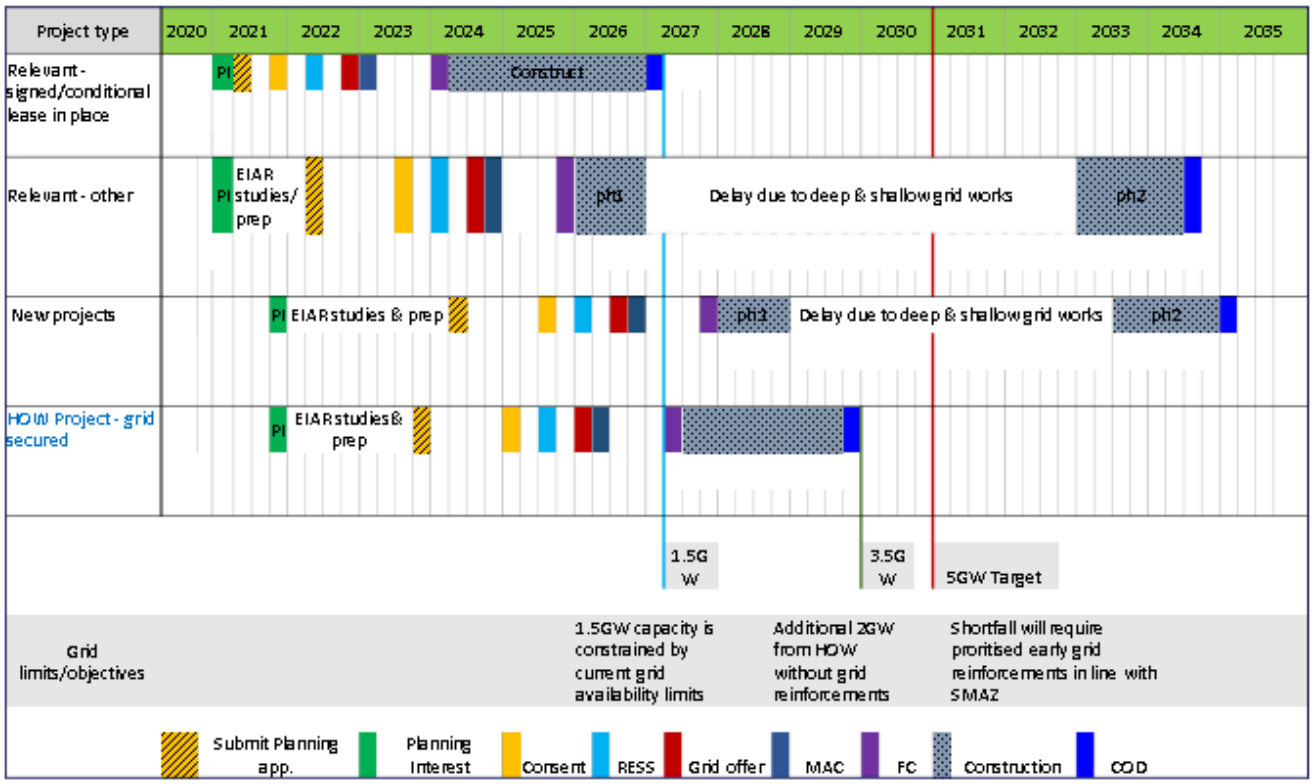

FIGURE 1 REPRESENTATIVE DELIVERY TIMELINES FOR DIFFERENT PROJECT CLASSES.

In order to mitigate any further delays and ensure 2030 targets can be met, we would urge DCCAE to enact the policy and regulatory changes set out in section 3.1.3 of this response to enable potential Hybrid Offshore Wind Projects and seek to prioritise the most straight-forward grid connections.

3.1.2 Advantages to hybrid connections approach

ESB GT believes that the enablement of Hybrid Offshore Wind (HOW) is an essential means for Ireland to deliver on its 2030 targets. Although we appreciate this is likely to be the main driver in accelerating this route, HOW connections offer a multitude of advantages, delivering strongly on all seven key drivers as set out in the consultation. We explore all seven drivers below and demonstrate the advantages of a hybrid connection approach in relation to each aspect.

i. cost levels

Hybrid Offshore Wind projects require little or no new infrastructure and they avoid costly onshore grid upgrades and reinforcements. Additionally, as Ireland's share of renewable generation has risen there is significant infrastructure associated with the conventional thermal power generators that is currently or may in the future be underutilised. The operational pattern of conventional power stations has changed from base load generation to one of facilitating and supporting renewable generation, by complementing the variability of renewables and / or through the provision of system services. Analysis by ESB GT has demonstrated that an offshore wind farm sharing a grid connection with a thermal power station exhibits a high degree of complementary generation with the impact on either generator in terms of run time being very small. As a result, the cost savings are not only driven by minimising investment in new infrastructure, but also by unlocking greater value from today's grid for the consumer. In addition, HOW projects will foster greater competition in the RESS auctions.

ii. environmental impact

Hybrid Offshore Wind grid connections help reduce the environmental impact of Ireland's offshore wind industry by reducing the cost and environmental impact of upgrades to the onshore grid. This will not only reduce local impacts and disturbance to wildlife but also the quantity of materials required.

iii. future proofing of policies and technologies

The grid was designed and built around large conventional thermal plants which will see decreased operating levels in the future. In time they will come to the end of their life which could leave grid assets underutilised or indeed stranded. Offshore Hybrid Wind grid connections would ensure that the value of this infrastructure would continue to be maximised for the next era of electricity generation.

iv. required infrastructure

By prioritising these Hybrid Offshore Wind grid connections, current infrastructure is more optimally utilised, maximising the value of the current network, limiting the need for new infrastructure as much as possible.

v. compatibility with Relevant Projects

Relevant Projects will consume extensive grid capacity. Hybrid Offshore Wind (HOW) grid connections represent the quickest and most cost-effective route to opening additional grid capacity in order to deliver even more offshore wind capacity. HOW grid connections are complementary to the Relevant Projects. They will not adversely impact Relevant Projects and there could be synergies through developing supply chains leading to an overall lower cost to the consumer. Relevant Projects and HOW projects are both essential to deliver the 2030 target of 5 GW from offshore wind. Relevant Projects and HOW projects should be delivered in parallel and with the same urgency and speed.

vi. social acceptance

Hybrid Offshore Wind grid connections would support more projects right around the whole Irish Coast rather than concentrating on East Coast as is envisaged for the Relevant Projects. Equally the economic benefits would be dispersed more greatly across the country, greatly aiding social acceptance.

Lengthy grid connection planning processes will be avoided by using current infrastructure and help minimise the impact that the development of Ireland's offshore wind sector will have on local communities. The success of Ireland's offshore wind sector and, in turn, its ability to deliver carbon reductions, is heavily dependent on maintaining good public acceptance. Every opportunity to minimise impacts on the general public will be beneficial to the whole sector.

vii. facilitating the timely development of offshore wind capacity to achieve the 2030 targets

It is difficult to see any alternative route other than Hybrid Offshore Wind (HOW) grid connections that could provide greater certainty in delivering on the timely development of offshore wind capacity to achieve the 2030 targets. In fact, ESB GT would have considerable concerns that in the absence of a HOW grid connection policy, there is insufficient time to secure the level of onshore grid reinforcements required to integrate enough offshore wind projects into the system. Transmission infrastructure projects in Ireland tend to attract significant public opposition and, as a result, experience significant delays and have always lagged greatly behind the rate of build out of renewable generation.

In addition to the seven drivers as explored above, prioritising the utilisation of HOW grid connections across the coast could expedite the development of a floating offshore wind sector in Ireland. It could help Ireland become a leader in this sector and maximise nationwide economic benefits (see Section 4), particularly in regions that have limited alternative options.

3.1.3 Actions required to enable greatest near-term development

ESB GT cannot see any alternative routes that can provide greater certainty to delivering Ireland 2030 targets, and as expressed previously, we would have serious concerns that this target would be largely undeliverable in the absence of Hybrid Offshore Wind connections.

Projects with the most straight-forward grid connections must be prioritised, and they should be advanced through an accelerated process in parallel and with the same urgency and speed as the Relevant Projects to other projects that meet the criteria and as proved by the Minister. This approach would enable greater competition between early developments, ensure greater utilisation of the existing network, provide better value to the consumer and greater likelihood of delivery for 2030.

Actions required to enable Hybrid Offshore Wind connections are:

A. Amendment to the MPDM Bill

An amendment supporting the facilitation of projects with the most straight-forward grid connections should be included in the Bill. ESB GT is seeking an amendment by means of a separate section in the Marine Planning and Development Management ("MPDM") Bill with specific provision for Hybrid Offshore Wind projects to facilitate the development of these projects through Hybrid Offshore Wind grid connections. This action needs to be carried out immediately to help open access to this valuable grid capacity and to guarantee Ireland a pathway to meet 2030 targets. This pathway should be supported across both near term development but also through the enduring model to allow ongoing access to this scarce resource.

We include here an example of how a provision could be set out to enable these projects suitable for 2030 delivery. Hybrid Offshore Wind projects are referred to as Hybrid Offshore Renewable Energy Projects in this example provision in order to reflect the terminology already used in the Bill.

The following provision should apply upon commencement of the Bill.

Head 47B Hybrid Offshore Renewable Energy Projects

Provide that projects that meet the following criteria will be described as Hybrid Offshore Renewable Energy Projects and will receive a Planning Interest subject to the terms and conditions which will apply:

- Projects which have consent to use existing grid connection infrastructure sufficient to connect the proposed offshore renewable energy project, with a capacity of not less than 200 MW.

The following provision should apply as an enduring measure.

Head 48 Treatment of Hybrid Offshore Renewable Energy Projects

Provide that projects that meet the following criteria will be described as Hybrid Offshore Renewable Energy Projects.

1) Projects which have consent to use existing grid connection infrastructure sufficient to connect the proposed offshore renewable energy project, with a capacity of not less than 200 MW.

2) In considering an application for a planning interest in respect of a Hybrid Offshore Renewable Energy Project, the relevant Minister shall have regard to the following criteria:

i. The type, nature, scope and extent of the proposed development;
ii. The public interest including the benefits to the State;
iii. The policy objectives of the State relevant to the proposal;
vi. The technical competence of the applicant; and
vii. The financial resources available to the applicant.

3) The relevant Minister shall, save in exceptional circumstances, make a determination on an application for a planning interest, or an application for an extension of a planning interest, in relation to a Hybrid Offshore Renewable Energy Project within 90 days of receipt of a complete application. Verification of the completeness of an application is at the sole discretion of the relevant Minister.

4) Where there are competing projects seeking to secure a Planning Interest for the same area then the provisions of 28(10) (competing applications and auctions) shall apply.

B. Modifications of Trading and Settlement Code

Work should be commenced to streamline the integration of Hybrid Offshore Wind connections into the market framework. This will build on work already ongoing within CRU on enabling hybrid connections as specified in Action No. 18 in the Climate Action Plan. ESB GT appreciates that this is a lengthy process that will unlock better use of grid capacity both onshore and offshore. Hybrid Offshore Wind projects must be prioritised first within this work stream, allowing streamline adaptions to be made to facilitate these types of projects as soon as possible given their importance to delivering the 2030 targets.

C. Modifications to Grid code

Modifications will be required to Grid Code to enable Hybrid Offshore Wind grid connections. This could start with the most simplified modifications by only allowing Hybrid Offshore Wind projects

from one entity at the connection in order to reduce complexity of legal arrangements. This would keep contractual arrangements the same between TSO and the grid connection counterparty and reduce lead time to connecting Hybrid Offshore Wind projects. The over installation clause from current code should be removed for these projects to allow the entity to build assets to maximise the utilisation of the MEC. It is also envisaged that both units will be controlled and metered separately, effectively co-located together and sharing the original contracted MEC, and both units will be compliant with the relevant sections of the Grid Code.

D. RESS Auction Rules

The auction rules for Renewable Electricity Support Scheme should be adapted to ensure Hybrid Offshore Wind connections can avail of this route to market. In particular, the over installation clause needs to be changed.

RESS auction rules should be updated to accommodate Hybrid Offshore Wind projects was already set out in action 18 within the CAP, and we seek for this work to be accelerated.

Floating Offshore Wind should be included as an eligible technology, reflecting developments internationally. The UK recent consultation on its CfD scheme has already moved to include this technology.

E. Technical requirements

Changes to market rules will be required for hybrid connections with different technologies (e.g. dispatchable thermal and intermittent generation) sharing the contracted export capacity. Dispatch and control of the hybrid units also needs to be considered, however each generation unit within the hybrid can be individually controlled and dispatched (centrally) by EirGrid. Each unit can also be separately metered. Similar changes were made to facilitate hybrid connections in the UK.

F. Grid delivery model

Even once these measures have been enabled, ESB GT believes that none of the presented grid models Option 1-4 are compatible in their current form to deliver these projects by 2030. Even under Option 1, there will be significant delays due to the time investment to develop a new Offshore Renewable Energy Development Plan (OREDP) and zone selections before a Planning Interest can be awarded. Therefore, we advocate that projects with the most straight-forward grid connections that meet the criteria (e.g. Hybrid Offshore Wind connections) and the Relevant Projects should be processed in parallel and with the same urgency and speed under a more streamlined model, empowered through an amendment to the Bill for a more immediate route to a Planning Interest. In terms of grid development, it will need to be developer-led in order to meet timelines, but offshore transmission assets could be built under a contestable model.

3.2 Enabling Faster and Cheaper Long-term deployment of Offshore Wind

Future offshore grid connection policy to support more long-term deployment of offshore wind should look to support unlocking the potential of Ireland's vast coastline. The grid delivery model will have much wider implications than just enabling better offshore and onshore grid planning. The model will have strong impacts across the entire wind farm value chain, down to how projects will be finally awarded. The chosen enduring model needs to support sustained growth and development of the sector, a supportive grid infrastructure, while still offering enough flexibility to adapt for new technologies and an ever-changing energy landscape. To harness the strengths of both the developer-led and plan-led models, a more balanced approach must be sought, which minimises the trade-offs and delivers the best outcome in the context of the Irish Market. ESB GT does not believe that the most optimal balance has been struck in the proposed models as they are currently presented.

ESB GT see different advantages in both approaches which must be considered across the wind farm value chain. We explore the merits of both approaches below by splitting the value chain into two parts; namely, offshore wind farm delivery, and transmission network planning and connection. Finally, in Section 3.2.3 we put forward ESB GT proposition for a more optimal future grid delivery model solution.

3.2.1 Offshore Wind Farm Delivery

A developer led approach to site selection, investigation, consenting and construction of wind farm (as set out in Options 1 and 2) would encourage more developers, support the continued growth of the sector, and provide greater certainty to investors. This would drive greater competition between developers and promote innovation to drive down costs, leading to a more cost-effective solution. Developers would pick sites and design projects to not only maximise the best resources but also based on detailed site knowledge and best use of available turbines to optimise the generation output. This would ensure costs are minimised, and the greatest value is obtained from each site and connection point. A more plan-led only approach could be led more by the available grid connection points resulting in less optimal site selection and design, failing to make the best use of the marine space. It would also allow developers to engage much earlier with coastal communities and stakeholders, which from our extensive development experience, is an essential ingredient in maximising potential social acceptance.

In contrast, a plan-led approach (Options 3 and 4) would require the establishment of a State Body to select sites, investigate those sites and deliver consents. Resources with the requisite knowledge, skills and experience in this area are in short supply and thus expensive. Experienced developers will have these resources in house to a greater or lesser extent whereas the State Body will most likely have to combine recruitment of experienced staff and the appointment of experienced consultants to deliver

these milestones. This would require significant time investment, ultimately proving to be an expensive and laborious option which could lead to a development hiatus after early developments, impacting confidence across the sector.

The extra time investment required to fulfil a plan-led approach (set out in option 3 and 4) will greatly delay projects and therefore reduce the number of project eligible to enter upcoming RESS auctions. This will have a negative impact on the auctions' level of competition, undermining one of the core benefits of this scheme design. Ultimately, the customer will lose out on savings driven by competitive forces, both in the development phase and in securing a route to market. Recent auction results in the UK are a testament to the savings that can be accrued.

Offshore projects are inherently risky and require significant upfront investment to develop site which may not be recovered if the site does not progress to construction. Developers have the experience and expertise in managing the large investment required to develop projects to bring them to market. This is a cost that developers are willing to cover to advance projects, and should a site not be successful, will be borne solely by the developer. In contrast, under plan-led arrangements (as seen in Options 3 and 4) this development risk would be attributed to the State Body (up to €100m per site) which would only be recovered for successful sites, a small fraction of overall sites investigated.

One major advantage often touted for a plan-led approach to offshore wind farm delivery is the ability to develop cost-effective offshore wind farms hubs that can share some grid infrastructure. ESB GT believes that a cost-effective hub solution is likely to be driven by the work already ongoing with the planning framework, such as marine spatial zoning, along with engagement with the TSO. The added value of each layer of planning needs to be carefully considered, particularly in the backdrop of a wider decarbonisation of the whole economy. Departmental resources will be key to drive and enable many facets of Ireland's transition, deeper focus in one area could lead to shortfalls elsewhere. It must also be considered that there may be limited opportunity to share infrastructure, when future projects are likely to much be larger in size with generation projects possibly in excess of 1 GW each.

3.2.2 Transmission Network Planning and Connection

The transmission network is one of the most critical national infrastructures which will require deep grid reinforcements to facilitate not only the large integration of offshore wind but also to enable greater electrification of the economy to aid the nation's wider decarbonisation and to facilitate long-term economic growth. It's essential that the Government should ensure that the grid is developed so that 5 GW of offshore wind can be connected by 2030. The level of development required, and the associated delivery timelines demand considerable proactive grid planning. Therefore, ESB GT fully endorses a more plan-led approach to the planning and construction of deep transmission reinforcements, both onshore and offshore, to deliver a more optimised grid system.

ESB GT believes that the most optimal solution would be for the State/EirGrid/ESBN to identify the grid capacity available to connect projects in a particular zone. Developers could then bid for the right to develop, consent and construct both the windfarm and its associated grid infrastructure in any given zone and connect to an agreed connection point, whether offshore or onshore. Offshore transmission assets could be constructed by the developer under a contestable build model, as widely used onshore. However, we would equally welcome that these assets would be constructed by a third party, particularly for the offshore deep transmission assets, provided that suitable developer compensation arrangements were in placed as discussed in the response to Question 12 in Section 5. ESB believes that developers are best placed to construct shallow grid connection assets most cost effectively while constructing the offshore wind farm. However, again, this could be undertaken using a contestable build model.

3.2.3 ESB GT Grid Delivery model proposition

ESB GT recommends that the following adapted grid delivery model proposition is adopted in place of the four Options proposed in this consultation. This proposition has a strong developer component and role in respect to the core offshore wind farm delivery. It then leans to a more plan-led approach for the planning, design and construction of the wider supporting grid infrastructure. We believe this is a stronger unification of the two approaches than was provided in the consultation document to best develop out the Irish Offshore Wind sector.

We have updated Table 1 from the consultation paper to illustrate ESB GT preferred approach across the numerous project phases of an offshore wind farm, clarifying the roles and responsibilities of the various entities involved.

Project phase	Responsibility	Description	Option 1 Developerled model	Option 2 Plan-defined, developer consents and builds	Option 3 Plan-led, developer build	Option 4 Plan-led	ESB GT preferred model
Pre-development	Zone selection	Selection of location of offshore zone wherein wind farm sites (including transmission assets) could be developed as well as identification and appointment of exclusion zones (e.g. military, shipping, fishing etc.)	DHPLG /DCCAE	DHPLG /DCCAE	DHPLG /DCCAE	DHPLG /DCCAE	DHPLG /DCCAE
	Site selection	Selection of location of offshore wind farm site (including transmission assets) within the selected offshore zone	Developer	Developer	State Body	State Body	Developer
	Timing wind farm roll-out	Timing of wind farm site development (roll-out plan)	Developer	Developer	State Body	State Body	Developer
	Offshore wind farm transmission asset planning	Timing of offshore wind transmissions asset development	Developer	Developer	EirGrid	EirGrid	Developer for shallow / EirGrid for deep reinforcements

Development	**Wind farm consents – application**	Consents for the offshore wind farm site (including surveys, wind resource and environmental assessments, and any required leases or licences)	Developer	Developer	State Body	State Body	Developer
	Offshore wind farm transmission asset consents – application	Consents for the offshore wind transmission assets (including environmental assessment and any required leases or licences)	Developer	Developer	EirGrid	EirGrid	Developer for shallow / EirGrid for deep reinforcements
	Financing	Financing of offshore wind transmission assets	Developer	Developer	Developer	ESB Networks	Developer through contestable build /ESB Networks
	Final selection of onshore grid connection point	Final decision on onshore grid connection point	EirGrid	EirGrid	EirGrid	EirGrid	EirGrid/Developer who utilises their own hybrid connection
	Functional design offshore transmission assets	High-level design of the functional requirements and specs of transmission assets beyond grid codes and applicable standards (e.g. voltage level, capacity, cable corridor, offshore substation location, landing points, shared assets if applicable)	Developer	EirGrid and Developer	EirGrid and ESB Networks	EirGrid and ESB Networks	EirGrid and ESB Networks
Construction	**Detailed design offshore wind transmission assets**	Detailed design of offshore wind transmission assets (e.g. full technical definition of transmission assets, installation methodology, construction timeline etc.)	Developer	Developer	Developer	EirGrid and ESB Networks	Developer /EirGrid and ESB Networks
	Offshore wind transmission asset construction	Construction and commissioning of transmission assets	Developer	Developer	Developer	ESB Networks	Developer under contestable build / Networks
O&M	**Ownership and maintenance**	Ownership and maintenance of offshore wind transmission assets (including decommissioning)	Developer	Developer	Developer	ESB Networks	ESB Networks
	Operation	Operation of offshore wind transmission assets	Developer	Developer	Developer	EirGrid	EirGrid
Onshore grid reinforcement	**Responsibility onshore grid reinforcement**	Planning, specification, consenting (EirGrid) and construction (ESB Networks) of required reinforcements in the onshore grid to facilitate the infeed of offshore wind energy	ESB Networks/ EirGrid Reactive	ESB Networks/ EirGrid Pro-Active	ESB Networks/ EirGrid Pro-Active	ESB Networks/ EirGrid Pro-Active	ESB Networks/ EirGrid Pro-Active
Auction design	**Auction type**		Amongst sites	Amongst sites	Site-specific	Site-specific	Amongst sites
	Definition of offshore capacity in RESS auctions		DCCAE	DCCAE	DCCAE	DCCAE	DCCAE
	Selection and definitions of onshore connection points (stations, capacity, timing) for RESS auctions		N/A	EirGrid and DCCAE	EirGrid and DCCAE	EirGrid and DCCAE	EirGrid and DCCAE
Ownership boundary	Ownership boundary assuming assets do not transfer to TAO in options 1, 2 and 3		Onshore	Onshore	Onshore	Offshore	Offshore

4. ACCELERATION OF FLOATING OFFSHORE WIND IN IRELAND

ESB GT intends to play a very big role in developing and harvesting the Irish Offshore Wind resource for the benefit of all. ESB GT believes Ireland is well positioned and can become established as a world leader in the deployment of offshore renewable energy.

Ireland controls a very large swathe of seas, over 880,000 km^2, an area more than 10 times our landmass and 16% of total EU waters. Looking beyond the East Coast of Ireland, most of these seas are to the South and especially the West of Ireland and therefore there is potential for offshore renewable energy at an enormous scale. Indeed, it is possible to imagine that Ireland can harvest offshore wind energy not just for our own purposes but to power much of Europe also.

However, the seas off the West Coast are deep, far in excess of today's limit of about 50m and will require the development of floating offshore wind farms which can be deployed in deeper waters in order to allow Ireland to exploit its vast deep-water resource. Major cost reductions in floating offshore renewable energy are projected by the end of this decade as the learning from pilot projects and newly deployed projects and a maturing supply chain act to underpin the growth in the technology. Floating offshore wind is no longer at an experimental stage and it is moving progressively and steadily towards a real commercial opportunity which could unlock the significant potential in Ireland's deeper waters.

There is also a sizable opportunity to stimulate the Irish economy through the growth of an indigenous and globally competitive offshore wind supply chain. Recent analysis suggests that by 2030, 2.5–4.5 GW of domestic offshore wind development could create between 11,424 and 20,563 supply chain jobs and generate between €763m and €1.4bn in gross value added[2]. This sector would greatly diversify and strengthen the Irish economy by offering an additional industry and manufacturing growth opportunity.

The recent consultation published by the UK Government's Department for Business, Energy & Industrial Strategy (BEIS) in March 2020 detailing amendments to the Contracts for Difference Scheme indicates how floating offshore is now being incorporated into plans. It proposes that Floating Offshore Wind be defined as a technology eligible for support under the Scheme. This action was taken to encourage such developments and provide greater certainty as BEIS sees this technology playing a key role in the decarbonisation of the UK economy under the net zero by 2050 target.

[2] Sarah Kandrot, Val Cummins, Declan Jordan & Jimmy Murphy (2020) Economic and employment impacts of offshore wind for Ireland: A value chain analysis, International Journal of Green Energy, DOI: 10.1080/15435075.2020.1791874

Scotland also has recognised the potential of floating wind to meet its climate action targets and has identified areas suitable for such developments in its Draft Offshore Wind Energy Sectoral Marine Plan. Floating wind comprises a very significant percentage of its planned development areas.

For Ireland to secure an international lead and maximise these potential economic benefits, floating offshore wind will need to be supported through grid policy, marine spatial planning, and visibility of a route to market. ESB GT proposes that a grid connection policy to support this maturing technology (including early access to grid across the coast of Ireland) and the development of this sector in Ireland should also be considered given the level of growth potential for the nation.

ESB GT strongly believes that the Government should accelerate the deployment of floating offshore wind off the west coast of Ireland. ESB GT recommends a government target of at least one large-scale floating offshore wind project in commercial operation in Ireland by 2030. This would signal the level of the Government's ambition in this area, would support jobs and enterprises operating in this emerging sector, and could serve as a template for further floating offshore wind projects in the 2030s.

Floating offshore wind should be enabled through changes to grid policy and amendments to the design of RESS auctions, all of which will deliver long-term benefits for Ireland.

5. RESPONSE TO CONSULTATION QUESTIONS

1. With respect to key driver (i), cost levels, which of models 1,2,3,4, or variant of these, delivers the most satisfactory results? Which features of the model, or variant, are the most influential for your given choice?

ESB GT is in full agreement that the chosen grid delivery model should aim to keep cost levels to a minimum whilst still enabling a thriving Irish offshore sector. The various models have different cost implications for projects due to several factors, and indeed the overall cost-effectiveness of the entire sector. These associated costs must also be balanced against the potential economic opportunity for Ireland, and Ireland climate change mitigation goals.

First and foremost, every effort should be given to maximise the utilisation of the existing infrastructure in order to limit the level of further investment that will be required to accommodate offshore wind. The enablement of Hybrid Offshore Wind connections could unlock at least 2 GW (with the potential for a further 1.5 GW) additional coastal connection capacity with almost immediate effect and with little or no investment required. Irrespective of the model chosen, it is imperative that these connections are facilitated to reduce overall cost, maximise the utilisation of the existing grid infrastructure and enable the greatest penetration of renewables.

Some of the most significant factors in reducing overall cost levels are developing investor confidence, strengthening competition, and providing timely signals for development. A key determinant of success in Ireland's offshore wind sector long-term will be its capability of delivering on the 2030 targets which would instil strong confidence in the sector and drive wider investment such as port upgrades and development of supporting businesses. Additionally, a greater number of projects brought forward would promote stronger competitive behaviour, and encourage more innovation, all putting downward pressure on costs. To meet the 2030 targets, the grid model should encourage a pipeline of projects that can meet this delivery timeline. Offshore projects are inherently risky, and they will also be subject to RESS auctions. Therefore, a pipeline far in excess of the 5 GW target as set out in the programme of government would need to be enabled near-term by the grid model.

Plan-led models (Options 3 and 4) would stifle early growth as there would be an extensive lead time to set up a new State Body to enable the process and delivery key milestones. This would be seen as a setback for the entire sector where interest has been mounting over the past number of years. This has knock on implications for the supporting supply chain and would ultimately drive up costs. It would also limit the level of competition for the early developments which would not deliver the best value for the consumer. ESB GT proposes that Relevant Projects and Hybrid Offshore Wind projects should continue to advance under a streamlined model variant as outline in Section 3.1.3. This would help kickstart the industry, rapidly enable a strong pipeline to reach 2030 targets, and induce more competitive behaviour to put downward pressure on cost. All enduring projects should then be

progressed using the adapted grid delivery model outlined in Section 3.2. This option harnesses the strong developer led cost reducing advantages while also allowing for greater proactive onshore and offshore grid reinforcement planning by EirGrid. Further projects will simply not be able to connect in the absence of this critical step and it will help keep cost down over the long-term.

Experienced developers of offshore wind understand that it requires an investment of tens of millions of euros to get a project from feasibility to full consent. They have extensive experience at managing this development risk and keeping costs to a minimum and they recognise that this expenditure is entirely at risk until consent is achieved. Plan-led models (Options 3 and 4) propose that the Government takes on this at-risk development expenditure at a potential financial exposure to the tax player. These costs can easily spiral upwards even for the most experience player. ESB GT believes these costs would be better controlled by the developers, particularly as competition between developers would ensure strong focus on cost.

Another important cost factor relating to the development of the offshore wind sector is the availability of both capability and resource capacity in the sector as a whole. Options 3 and 4 propose the establishment of a State Body to select sites, investigate those sites and deliver consents. Resources with the requisite knowledge, skills and experience in this area are in short supply and therefore expensive. Experienced developers will have these resources in house to a greater or lesser extent whereas the State Body will most likely have to combine recruitment of experienced staff and the appointment of experienced consultants to deliver these milestones, ultimately an expensive and time-consuming option.

There is no doubt that, from a cost perspective, inefficient development of grid infrastructure could lead to a more expensive route to the delivery of grid infrastructure. This is the main risk of a more developer-led approach. The level of development required, and the associated delivery timelines demands considerable proactive grid planning. Therefore, ESB GT fully endorses a more plan-led approach to the planning and construction of deep transmission reinforcements, both onshore and offshore, to deliver a more optimised grid system and keep costs to a minimum.

As developers, we see a lot a merit in constructing the offshore shallow connection assets at the same time as the offshore wind farm. However, in terms of cost we believe there would be little difference in these assets being built by a third party under a contestable build model.

2. With respect to key driver (ii), environmental impact, which of models 1,2,3,4, or variant of these, delivers the most satisfactory results? Which features of the model, or variant, are the most influential for your given choice?

The enablement of Offshore Hybrid Wind connections is the single biggest offshore wind grid policy decision which could ensure the greatest resulting environmental protection, particularly in terms of

climate change (arguably the greatest global environment issue of our time). It represents the quickest and most cost-effective route to delivering Ireland's 2030 targets, allowing Ireland to accelerate it climate change goals and reduce harmful emissions from fossil-based generation to an absolute minimum.

Irrespective of the model chosen, enabling hybrid connections would unlock greater value from existing infrastructure, reduce the number of new sites required, and in turn limit the overall disturbance to the onshore environment. It would also greatly decrease the need for further grid upgrades and reinforcements, further protecting the environment. Focus could then instead be placed on mapping environmental constraints offshore to ensure an optimal route to best safeguard the environment can be determined for potential offshore cable corridors and cable landfall locations.

Hybrid offshore wind connections can therefore help accelerate Ireland's climate change mitigation goals whilst minimising the more localised environmental impact of Ireland's developing offshore sector.

For all four grid models proposed, it is assumed that the State in partnership with EirGrid and ESBN will identify the relevant grid connection points and the associated capacities. Accordingly, there is unlikely to much differences between the four model options in terms of environmental impact, as cable landfall locations can be coordinated through engagement between the TSO and potential projects. ESB GT therefore does not see this as a key determinant in terms of option selection. A bigger determinant of environmental impacts of all projects is the wider planning and environmental framework for which they would all be treated equally, regardless of the grid model employed.

3. With respect to key driver (iii), future proofing and technologies, which of models 1,2,3,4, or variant of these, delivers the most satisfactory results? Which features of the model, or variant, are the most influential for your given choice?

Ireland faces greater technical hurdles, and market impacts from the integration of large volumes of offshore wind than any other jurisdictions to date due to the small size of the electricity system. Innovation will be key to deliver the best grid solutions and the right market arrangement to best accommodate this swift transition to a highly renewable system. A developer-led model would drive developers to be more innovative through competitive forces and provide greater flexibility as new technologies are adopted.

How we use and manage the grid is fast evolving and decisive action must now be taken to enable Hybrid Offshore Wind projects to ensure that the utilisation of the existing infrastructure continues to be maximised in order to provide the greatest value to Irish consumers. The grid was designed and built around large conventional thermal plants that will not be experiencing the same level of running in the future. In time they will come to the end of their life which could leave grid assets underutilised

or indeed stranded. By permitting co-location of offshore wind at these connections, it will 'future proof' the value of these connections, reduce the level of reinforcement required, and accelerate build out.

Ireland would gain very limited benefit from the same future proofing measures seen in other jurisdictions to greatly increase capacity at appropriate grid nodes due to the small size of Ireland electricity system. Any influx of generation that significantly exceeds current single infeed limit of 500 MW will bring with it a range of potential stability and system issues. To increase this limit to 700 MW to accommodate the new Celtic interconnector will rely heavily on the DS3 programme to deliver the required system services. Any further increase of the limit could greatly test the technical limits of the system.

The Navigant report suggest that there is ~1.5GW of offshore wind capacity on the East coast of Ireland without any significant transmission reinforcements and it is anticipated that this capacity will be used to accommodate the most advance relevant/legacy projects on a developer-led basis. In parallel and with the same urgency and speed, Hybrid Offshore Wind connections could help unlock at least 2 GW of additional grid capacity (with the potential for a further 1.5 GW) around the Irish coastline. A more coordinated offshore transmission system planning approach must also be progressed for the timely delivery of required new infrastructure to accommodate further projects. Therefore, a more plan-led approach should be considered for the grid infrastructure which allows EirGrid to focus on proactively planning and delivering grid reinforcements and delivering the required capacity at designated connection nodes both onshore and offshore. The development of connection nodes offshore could give more flexibility in terms of projects that could potentially connect in at that point.

A range of reinforcement options should be considered to support a successful roll out of Ireland's offshore sector. For example, one option might be an extension of the 400kV network around Dublin to the coast or even offshore by developing a high capacity offshore wind collector node. The offshore wind collector node would be future proofed for further expansion, e.g. looping in additional circuit connection onshore. Proactively reinforcing the onshore grid not only benefits offshore wind but also the wider transmission system users including large demand users and other types of generation.

4. With respect to key driver (iv), required infrastructure, which of models 1,2,3,4, or variant of these, delivers the most satisfactory results? Which features of the model, or variant, are the most influential for your given choice?

It is vital to utilise, maximise and upgrade, where possible, existing onshore infrastructure to facilitate early offshore wind connections. This includes the facilitation of Hybrid Offshore Wind and conventional generation connections where such power stations are located at coastal locations and close to large demand centres. A co-located offshore wind and thermal generator hybrid project would reduce the level of infrastructure required and make optimum use of existing transmission assets. Flexible gas-

fired generation is vital to support a renewable power system and as the SNSP limit is increased to 75% and beyond, hybrid thermal and offshore wind connections offer a unique opportunity maximise the use of existing grid infrastructure.

Thus far, most of the focus has resided on developing the East coast grid. Offshore connections in the South and West coast areas need to be fast-tracked in order to maximise the use of existing infrastructure. Again, following a develop-led approach (as seen in Option 1 and 2) to site consenting and development would allow developers to bring forward floating wind project much quicker, allowing Ireland to take an international lead while also getting the greatest value from existing infrastructure. A plan-led approach to site consenting and development (as set out in Options 3 and 4) would seriously delay these developments. Customers could end up paying for additional reinforcements on the east coast near term when projects could be happily served by south and west grid connections which could end up being underutilised as a result. This approach has an added benefit of diversifying the wind generation not only in terms of geographical territory but also in terms of overall grid integration.

5. With respect to key driver (v), compatibility with Relevant Projects, which of models 1,2,3,4, or variant of these, delivers the most satisfactory results? Which features of the model, or variant, are the most influential for your given choice?

ESB GT believes that none of the grid delivery models as presented in this consultation are completely compatible with reaching the 2030 target. The time commitment required to enact the MPDM Bill, develop a new OREDP, and undertake zone selection would push all prospective projects past the 2030 delivery time horizon. We recommend that an interim streamlined approach prioritising most straight-forward grid connections should be progressed to enable a project pipeline capable of delivering on this ambitious goal. The urgency to progress these developments is further emphasised by the new 5 GW by 2030 target set out in the Programme for Government.

Relevant and Hybrid Offshore Wind projects should be progressed in parallel and with the same urgency and speed under a streamlined process (as described in Section 3.1) to increase the level of competition between early developments. This approach would promote downward pressure on RESS auction bids, thereby delivering better value to the end consumer.

The Hybrid Offshore Wind projects do not risk the build out of any costly unrequired grid reinforcements or suboptimal onshore and offshore infrastructure coordination, the main disadvantage of a purely developer led approach. In fact, depending on which projects prove successful at auction, they could greatly reduce this risk than progressing the Relevant Projects alone. Since Hybrid Offshore Wind projects are fully decoupled from these infrastructure requirements, they not only help reduce this investment risk but could also shorten delivery timelines for the required capacity for 2030 targets.

Grid Options 3 and 4 are not compatible with delivering these early developments. These approaches require long lead times and extensive resources to implement from a State Body that current doesn't even exist. These models are simply not appropriate to delivering on Ireland's 2030 targets, or indeed, to igniting a strong and sustainable offshore sector and associated supply chain.

We advocate that a full transition to our adapted grid delivery model (see Section3.2.3) would be progressed for future projects which could enable timely proactive grid planning whilst still encouraging developers to deliver more cost-effective market driven outcomes.

6. With respect to key driver (vi), social acceptance, which of models 1,2,3,4, or variant of these, delivers the most satisfactory results? Which features of the model, or variant, are the most influential for your given choice?

National and local social acceptability of offshore wind developments will be fundamental in developing a thriving Irish offshore energy sector. This represents only one element of Ireland's wider low carbon transition that must secure wider social acceptance if Ireland is to achieve its climate change mitigation goals. A wider programme of strong political and local leadership needs to be developed to support social acceptance of the implications of this transition. A key aspect will be educating the public on the essential role offshore wind will play in achieving these goals, and the array of benefits that will be provided to society by this sector such as greater energy security, clean power, better air quality and the potential for economic growth and job creation. Accordingly, ESB GT sees the grid delivery model playing a minimal role in influencing social acceptance.

Early local engagement, strong continued communication and consultation with coastal communities will be essential in maximising public acceptance regardless of whether a developer or plan-led approach is chosen. No two communities are the same and each will have its own unique set of concerns and requirements that they would like to be addressed. ESB GT therefore sees benefits that would be drawn from a developer-led approach to site selection and consenting, allowing much earlier engagement between the developer and the local community, and such an approach would encourage the development of a relationship that best suits all stakeholders. A more plan-led approach, such as Options 3 and 4 for the site delivery aspect of the wind farm project phases, could restrict this more tailored interaction and push for a more rigid mono-culture approach which may ultimately put social acceptance more at risk.

Public acceptability has proven to be the main barrier to development of new grid transmission infrastructure in Ireland over the last two decades. The adoption of the Hybrid Offshore Grid connections will enable the most efficient use of existing infrastructure and reduce the requirement for additional grid reinforcements. This approach would minimise the impact on local communities and consequently achieves the best outcome from a social acceptance perspective.

7. With respect to key driver (vii), facilitating the timely development of offshore wind capacity to achieve the 2030 target, which of models 1,2,3,4, or variant of these, delivers the most satisfactory results? Which features of the model, or variant, are the most influential for your given choice?

Offshore wind projects can typically take more than a decade to develop and commission and this is in jurisdictions where the full policy and regulatory framework has been completely established. This demonstrates the huge challenge at hand when striving to meet Ireland's 2030 target. All decisions that can be taken to avoid delay and even streamline the process needs to be given careful consideration.

The quickest and most cost-effective way of increasing the national potential project pipeline, of increasing available grid capacity and reducing delivery timelines is by enabling the co-location of offshore wind at conventional generation connections. Irrespective of the model chosen, Hybrid Offshore Wind grid connections will greatly expedite the delivery of offshore projects and unlock greater value from the existing infrastructure. It is difficult to see any alternative route other than Hybrid Offshore Wind grid connections that could provide greater certainty in delivering on the timely development of offshore wind capacity to achieve the 2030 targets. In fact, ESB GT would have considerable concern that in the absence of Hybrid Offshore Wind connection policy, there is simply not adequate time to secure the level of required onshore grid reinforcements to integrate enough offshore wind projects into the system.

In order to mitigate any further delays and ensure 2030 targets can be met, we would urge DCCAE to enact the policy and regulatory changes set out in Section 3.1.3 of this response to enable potential Hybrid Offshore Wind Projects and seek to prioritise the most straight-forward grid connections.

The chosen grid model will be central to enable the delivery of the 2030 targets. After the implementation of Hybrid Offshore Wind connections, it is important that a grid model is chosen which gives both Hybrid Offshore Wind projects and the Relevant Projects the greatest opportunity to meet the 2030 deadline. However, ESB GT believes that none of the grid delivery models as presented in this consultation are completely compatible with reaching the 2030 target.

ESB therefore advocate for a twin track approach to early auctions, progressing both Relevant Projects and the Hybrid Offshore Wind projects in parallel and with the same urgency and speed under a more streamlined process as described in section 3.1.Future projects should be progressed by transitioning to our proposed adapted grid model as set out in Section 3.2 to enable the necessary proactive grid reinforcement planning and development that will be required to support the industry as it grows.

A highly prescriptive approach to site selection and consenting (as seen in Options 3 and 4) are incompatible with the timely delivery of projects for 2030 as the industry would come to a complete standstill while the establishment a new State Body would delay the consenting process. There is currently not the expertise or the resources to carry out this process or early developments. The optimal delivery solution will be for the Government to give locational signals, for the offshore developers to develop and construct the projects and for the network specialists to focus on the design and consent of the grid connection assets in parallel with the same urgency and speed. Again, our adapted grid delivery model as described in Section 3.2 is best placed to deliver this outcome.

8. Rank the key drivers in order of importance 1-7, which have the greatest impact on the choice of model.

ESB GT agree that all the stated drivers are of great importance when considering the choice of grid delivery model. However, we have prioritised them here in relation to their importance in delivering a thriving Irish offshore wind sector.

Ranking	Driver	Justification
1.	Timely development of capacity for 2030	The efficient delivering of this capacity will not only allow Ireland to achieve the 2030 targets but will enable the wider decarbonisation of the economy hinging on the development of this capacity. Earliest delivery of this capacity could help kick start the industry and develop a strongly supported offshore wind industry.
2	Cost levels	The level of investment required across Ireland's economy to enable a low carbon transition will require the most effective use of all investment and ensure the greatest value to the end consumer. The failure to ensure the timely delivery of this new capacity could leave Ireland very exposed to carbon related costs. The more capacity that can come to market, the greater the level of competition putting downward pressure on cost
3	Environment	Climate change is arguably the greatest global environment crisis of our time. The model should look to enable accelerated climate change mitigation. This of course should be delivered while limiting the impact of the local environment.
4	Social acceptance	Obtaining wider social acceptance is critical in developing a thriving offshore wind sector and a top priority for ESB as a developer. In our extensive experience, earliest engagement between developers and communities is key.
5	Required infrastructure	All efforts to unlock the valuable of the capacity of the existing infrastructure should be prioritised before extensive programs of reinforcements are finalised. The enablement of Hybrid connections will be key however this can be progressed

		irrespective of model. Further reinforcements planning is important to allow continued growth of the sector but should not stifle near-term developments.
6	Future proofing	Ireland has less scope for future proofing measures seen in other markets due to the single infeed limit to maintain system stability. The wider planning and regulatory framework would help the development of common hubs irrespective of the chosen model.
7	Compatibility with Relevant Projects and Hybrid projects	Relevant and hybrid projects should be progressed as soon as possible under a streamline process as described in Section 3.1. The compatibility of these projects with the enduring model should not be considered as it would only delay the sector and potentially result in a sub optimal long-term enduring model

9. How important is it for Ireland to develop an indigenous offshore wind energy industry? How best can an indigenous industry be developed?

Ireland's expansive seabed covers 16% of total European sea waters and offers some of the best potential wind resource in Europe. First and foremost, this will be a key renewable energy resource to meet Ireland 2030 climate action goals, and to unlock Ireland's long-term decarbonisation ambitions as we move out towards 2050. This vast resource also offers Ireland the opportunity to ultimately become self-sufficient in energy and offers an undeniable potential to become one of the biggest green energy exporters in Europe. Developing an indigenous offshore wind energy industry would deliver on many policy fronts, such as, reducing carbon emissions, improving security of supply, job creation, economic stimulus, and regional development.

There is a sizable opportunity to stimulate the Irish economy through the growth of an indigenous and globally competitive offshore wind supply chain. Recent analysis suggests that by 2030, 2.5–4.5GW of domestic offshore wind development could create between 11,424 and 20,563 supply chain jobs and generate between €763 m and €1.4bn in gross value added[3]. This sector would greatly diversify and strengthen the Irish economy by offering an additional industry and manufacturing growth opportunity.

ESB GT recommends that the following actions are taken to allow Ireland to reap the wide spectrum of benefits offered through developing an indigenous offshore wind energy industry

[3] Sarah Kandrot, Val Cummins, Declan Jordan & Jimmy Murphy (2020) Economic and employment impacts of offshore wind for Ireland: A value chain analysis, International Journal of Green Energy, DOI: 10.1080/15435075.2020.1791874

A. Policy and regulatory certainty

Despite gaining significant attention from industry for the past decade or more, the sector has yet to find its feet due to the substantial level of uncertainty still surrounding its policy and regulatory framework. ESB GT is greatly encouraged by recent developments this past year both with the draft of the MPDM bill, the consultation on the NMPF, and now this consultation on most suitable grid delivery models.

ESB GT urges the government to enact the MPDM Bill, rapidly progress the finalisation of the NMPF and launch the next OREDP directly in order to allow the sector to really take off and to enable more long-term policy planning to maximise Ireland's potential.

Organisations involved across the whole offshore wind policy and regulatory landscape will see a tremendous growth in their workload and a change in the type of expertise required. The Government must develop an appropriate human resource plan to ensure that the qualified people with the necessary experience and expertise are available to support delivery of Ireland's marine ambitions across the value chain.

B. Clear route to market

The Irish energy industry is on the cusp of its first RESS auction but still has little visibility of future auctions in terms of timings or volumes, or even how terms and conditions may evolve over the lifetime of the scheme. It has just been announced that the RESS scheme has attained State Aid Approval, however this was only confirmed to 2025. There is a substantial risk that with further delays to policy development in this space that many offshore wind projects may fail to qualify for this deadline. We would recommend providing better visibility of the auction timelines, and progress consultation on subsequent auctions term and conditions, particularly regarding both offshore wind and floating offshore wind. In order to boost investor confidence, we would recommend avoiding this potential policy cliff by disseminating future policies for supporting this sector more long-term.

C. floating wind leadership development

ESB GT recommends that the government should set a goal to have at least one floating offshore wind project in service by 2030 as it would signal Ireland's belief and ambition for floating offshore wind. It would support jobs and enterprises operating in this emerging sector and could serve as a template for further floating offshore wind projects in the 2030s.

D. Ireland as an energy exporter

Ireland's wind resource, particularly when you consider the potential of the south and west coast, is many multitudes greater than its domestic demand, offering a strong capacity for export. Planned

additional interconnectors for Ireland will have a role to play in delivering this surplus power to other offshore markets. However, Ireland will need to develop new means of storing this additional wind energy on shore for subsequent use. In this context, we could use the copious volumes of wind energy that would be generated at sea to underpin and supply the development of a hydrogen energy economy in Ireland as well as exporting to new hydrogen markets overseas.

Policy should be created to leverage of wider EU offshore renewable energy and hydrogen strategies recently published[4], and harness this growing momentum, and ensure to place Ireland in the epicentre of this wider European low carbon energy revolution.

10. How should onshore and offshore grid connections be optimised? For example, should consideration be given to common hubs for adjacent projects?

Co-locating offshore wind and thermal generation as a hybrid connection at an existing power station is an ideal method of optimising offshore and onshore connections, for the reasons previously outlined. It is vital to utilise, maximise and upgrade, where possible, existing onshore infrastructure to facilitate early offshore wind connections in order to meet the 2030 targets.

It is likely over time that common hubs will form as the offshore sector grows, particularly in areas where the transmission system is particularly strong. The grid should be strengthened in these regions to facilitate the development of hubs. Suitable no regret regions would be on the 400kV network around Dublin and the west coast node at Moneypoint, which both have the capability of delivering power straight to demand centres. Hybrid connections should be the first step in establishing these hub regions to maximise the value of existing infrastructure.

In addition to the wider marine planning and regulatory framework, adopting a more plan-led approach to the grid infrastructure aspects would ensure proactive reinforcement and grid planning by EirGrid to facilitate the development of cost-effective common hubs. ESB GT would encourage this approach as it would allow more offshore to connect over the medium term, reduce overall costs of connection and thereby provide savings to the end consumer.

11. Are there any further considerations which might reduce the cost to the consumer?

ESB GT believe that the following three major steps are required to not only support a better and quicker development of the offshore wind sector but would also reduce costs to the consumer.

A. Enabling Hybrid Offshore Wind connections
B. Proactive onshore grid reinforcements planning to enable and prevent delays to projects

[4] A hydrogen strategy for a climate-neutral Europe. European Commission, COM(2020) 301 final.

C. System operation and market design to facilitate the integration of large volumes of intermittent renewables.

Each step and their role in reducing cost to the consumer are outlined below.

A. Enabling Hybrid Offshore Wind connections

Adapting onshore thermal generation connections to accommodate the co-location of offshore wind through a hybrid connection is a no-regret route to deliver immediate cost reduction to the consumer. Under all scenarios, it allows greater value to be extracted from existing infrastructure and reduces the overall requirement for further grid reinforcements across the system. This step should therefore be advanced irrespective of the chosen grid model. It also acts as a future proofing measure for these connections as thermal generation evolves from base load generation to one of facilitating and supporting renewable generation (by complementing the variability of renewables and / or through the provision of system services). Hybrid Offshore Wind connections would reduce cost to consumer by minimising investment in new infrastructure, but also by unlocking greater value from the grid for the consumer. Wider benefits of Hybrid Offshore Wind connections and the actions required bring them on stream can be found in Section 3.1.1.

B. Proactive onshore grid reinforcements planning

It is recognised by Government and others that projects developed along the East Coast will make the largest contribution to the 2030 targets. The Navigant report suggest that there is ~1.5 GW of offshore wind capacity on the East coast of Ireland without any significant transmission reinforcements and it is anticipated that this capacity will be used to accommodate the first few successful projects. Hybrid Offshore Wind connections could unlock at least 2 GW with the potential for a further 1.5 GW to help bridge the capacity gap to meet Ireland's 2030 targets. All further projects will require substantial grid reinforcements which historically have been met with strong opposition and this has led to significant delays and costs. It critical that a proactive and coordinated grid reinforcement planning program is undertaken and that identified required reinforcements are advanced. Otherwise the required capacity to accommodate these projects will not be available in time and could bring the whole sector to a halt, leading to higher overall costs. It could also risk Ireland's ability to deliver on its 2030 targets and the sectors role in enabling a wider low carbon transition. This would leave Ireland very exposed to climate risk and its climate change obligations, prolonging our reliance on fossil fuels and could lead to significant long-term costs for consumers.

Our proposed adapted grid model as described in Section 3.2 would allow for more proactive grid reinforcement planning and development to be carried out, without impairing the cost reducing competitive forces encouraged through an developer-led approach to site selection and consenting.

Other jurisdictions, such as the Netherlands, provide developer compensation through the renewable auction for grid delays to reduce project risk and drive down cost. Under these arrangements, failure to deliver timely grid reinforcements could prove rather costly to the consumer.

C. System operation and market design to facilitate the integration of large volumes of intermittent renewables.

Grid operation and market arrangements need to continue to evolve with Ireland's growing influx of intermittent renewables in other to maximise the value of these assets and in turn reduce overall cost to consumers. As renewables grow, energy prices will drop, and a greater provision for systems services will required, reflecting their critical role in maintaining grid stability and facilitating greater integration of renewables the network.

In order to give assurance to potential investors and minimise the costs to customers of achieving the required acceleration of renewable integration, the regulatory authorities must be empowered to plan for the long term quickly. This includes the implementation of the recast Electricity Regulation and Directive which has been designed as part of the Clean Energy Package (CEP) to place renewable generation at the heart of the wholesale energy market. Key to this process is ensuring that the system operators resourced sufficiently to deliver the required system and processes in a timely manner.

EirGrid as part of their 2020 – 2025 strategy have set ambition for the SNSP limit on the system increase to 95% by 2030. EirGrid, working with SONI in Northern Ireland, must now provide the environment for the innovation and investment to maximise the utilisation of the new and existing renewable generation through recognising the increasing value of flexibility and resilience system services provide.

12. Currently, developer compensation is not provided for delayed delivery of grid connections to renewable generators connecting to the network. Should developer compensation arrangements be provided for delivery of offshore grid connections to renewable projects? Similarly, who is best placed to bear the outage risks under the various options?

The development of an offshore wind project is a time consuming, costly and risky endeavour with many hurdles to overcome, and can take well over a decade to bring to fruition. These projects by their nature already have high associated development risk before potential grid delays are even considered. Without any arrangements, this additional risk from potential grid delays could greatly increase the cost of financing a project, or indeed halt projects altogether in areas where large grid reinforcements are required.

Firstly, ESB GT believes that a similar approach should be taken to grid delays as can be seen in the UK's CfD scheme, where the longstop date of the project can be extended to accommodate these delays. Otherwise viable projects could default on the RESS terms due to a risk they are not able to

directly manage, thereby risking Ireland's ability to meet the 2030 targets and damaging overall investor confidence in the sector.

ESB GT would also be supportive of developer compensation arrangements to be included within the RESS scheme to address the risk of delayed grid delivery as seen in the Netherlands, as described in the Navigant report.

13. Are there any further drivers which should be considered when assessing a grid delivery model suitable for offshore wind development in Ireland?

Economic benefit, regional development and job creation are all key drivers that should be considered when evaluating the best grid delivery model for Ireland.

Floating offshore wind represents a unique opportunity to delivery on a multitude of Irish policy goals, particularly in regional areas with more limited options for economic development. However, time is very much of the essence, and this window of opportunity will begin to close as other nations quickly catch up. Given the level of economic benefit for Ireland, ESB GT believes that greater focus should be given to accelerate the deployment of floating offshore wind off the west and south coast of Ireland. Actions should now be taken to unlock the potential of the west coast and its expansive resource. It is critical that adequate investment in west coast grid infrastructure is also advanced to transport power across the country and help Ireland to reach the potential of 30 GW of offshore wind, as set out in the recent Programme for Government.

The chosen Grid model will be a key policy decision to unlock this potential for Ireland. For Ireland to reap the most benefits, this sector must be fast-tracked as soon as possible. Offshore Hybrid Wind connections could unlock this opportunity almost with immediate effect, catapulting Ireland as an international leader in this space. A prescriptive plan-led approach to site selection and consenting (Options 3 and 4) would delay the whole sector, while developing a new state body etc; These models are simply not compatible with encouraging this nascent sector and could push this development well out into the next decade. At which stage, Ireland would likely be lagging well behind other markets, forever losing access to the deeper economic benefits that can be delivered through international leadership. The loss of this potential leadership is further heightened by the recent explosion in interest for green hydrogen, and the future opportunity to now become a serious green energy exporter for markets across EU, particularly given the extent of the seabed controlled by the state. Failure to launch this sector now would see other nations fulfil this ambition, and risk Ireland's ability to compete when we did eventually catch up, due to our more expensive nascent sector, relying on a more immature supply chain.

ESB GT believes that in addition to enabling hybrid connections, the adapted model (as described in Section 3.2) should be employed for further developments to enable the timely and sustained growth of the floating offshore sector. This approach would provide flexibility to developers to bring innovative projects forward across the Irish coastline but still ensuring supportive grid reinforcements can be progressed in parallel by EirGird.

14. Overall, which model, or model variant, is most appropriate as an enduring grid delivery model for offshore wind in the Irish context?

ESB GT supports the use of an adapted grid model (developed by combining aspects from different models) for enduring grid delivery, as we believe it will minimise cost, allow for the timely delivery of the sector while enabling more proactive grid planning and development. This approach will support the development of a stronger overall Irish industry, encourage greater competition, drive better climate change mitigation, and provide greater flexibility as new technology are adopted, and the wider energy system evolves. A deeper analysis of our reasoning can be found in section 3.2.

15. It is accepted that a transition towards the chosen enduring grid delivery model will be required to leverage the development of the Relevant Projects in the short term. Considering the high-level roadmaps set out at Figures 5 and 6 above, what should this transition look like?

There are two key priorities that should be enabled by the grid models chosen for the Irish market. Firstly, the model should encourage a healthy pipeline of projects that can deliver to the ambition timeline required to meet 2030 targets. Secondly, the model should inject immediate momentum to kick start the industry in order to help build a strong long-term Irish offshore sector. ESB GT therefore supports the use of both an interim model to enable these early developments and then a transition to an enduring model to allow for the best long-term development of projects as the sector grows.

As described in section 3.1, we advocate for a twin track approach to early auctions, progressing both Relevant Projects and the Hybrid Offshore Wind projects in parallel and with the same urgency and speed under a more streamlined process. Future projects should then be progressed under the adapted model (as described in Section 3.2) in order to enable the necessary proactive grid reinforcement planning and development that will be required to support the industry as it grows. This approach will drive stronger levels of competition, maximise the potential of Ireland's Offshore sector, and strengthen wider industry investor confidence.