Scottish & Southern Electricity Networks

TRANSMISSION

Sent by email:
Offshore.Coordination@ofgem.gov.uk

22 September 2021

Dear Neil,

Changes intended to bring about greater coordination in the development of offshore energy networks

Thank you for the opportunity to respond to Ofgem's consultation on changes intended to bring about greater coordination in the development of offshore energy networks. As well as this response, please see comments returned through the joint response from GB Transmission Owners (TOs) and the ScotWind roundtable.

As noted in our response of 16 April we are very supportive of, and actively engaged in, greater coordination in the development of offshore energy networks. We agree with Ofgem's view that coordination across a multitude of stakeholders and industry processes is paramount in seeking to enable coordination in the delivery of 40GW of offshore wind in GB by 2030 including 11GW from Scotland. With this in mind, SSEN Transmission has been actively advocating for a more coordinated effort through the establishment of the ScotWind Roundtable, offshore wind developer engagement, development of the generation map and proposing the formation of, and since being an active participant in, the Central Design Group.

We strongly support the overarching aim of the Offshore Transmission Network Review (OTNR) in ensuring that future connections for offshore wind are delivered with increased coordination while ensuring an appropriate balance between environmental, social, and economic costs. The Pathway to 2030 workstream supports this aim within existing regulatory and legal frameworks, while emphasising the need for delivering at pace to meet 2030 targets.

Failure to adopt the correct policy principles and considerations, could lead to irreversible detriment both societally in delaying Net Zero and also preventing future system coordination. The OTNR overarching aim should remain central to achieving these objectives and should apply to Ofgem's own assessment of the 2030 delivery models. The introduction of new and untested models for delivery risks achieving the 2030 targets. We encourage Ofgem to take the lessons learned from the onshore transmission regime and the TOs ability and track record to develop, operate and maintain an efficient coordinated and economic network. We would also encourage Ofgem to consider approaches being adopted in Europe that are prioritising TO-led coordination as part of achieving climate change goals. These are the same priorities that should also heavily inform this Ofgem review and are another demonstration that OTNR principles give a good guide on the decision making process[1].

Our full response to the individual consultation questions is provided separately, including a review of the proposed 2030 delivery models. To summarise our overarching position it is our strong view that all policy options for

[1] https://www.offshorewind.biz/2020/12/29/baltic-sea-tsos-agree-to-cooperate/

development of a holistic onshore and offshore network design and delivery of offshore (and onshore) infrastructure must be assessed against the principles outlined below, including whether the option(s):

1) accelerates delivery of 2030 and Net Zero targets;
2) enables coordination and collaboration; and,
3) provides certainty to consumers, stakeholders (including offshore wind developers and onshore TOs) and the supply chain.

To deliver a Pathway to 2030 we would urge Ofgem to discard options if these principles are not met.

SSEN Transmission will continue to play a key role in the OTNR and Central Design Group while constructively engaging with Ofgem on the development of this policy framework. Our response highlights a number of matters that require further consideration and analysis to meet 2030 targets. Given the fundamental importance of this area of policy and its impact on GB consumers and Net Zero, we must reserve our position on the outcome of the current process.

We look forward to continuing our engagement with Ofgem and would be happy to discuss any part of our response in more detail.

Yours sincerely

Sara McGonigle
Interim Head of Regulation

Executive Summary

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We respond to Ofgem's questions in a separate response with three overarching principles in mind. These are that policies introduced should: 1) **accelerate**, not delay delivery of 2030 targets; 2) enable **coordination** and **collaboration**; and 3) provide **certainty** to consumers, stakeholders (including offshore wind developers and onshore TOs), and the supply chain. All policy options for development of a holistic onshore and offshore network design and delivery of offshore (and onshore) infrastructure must be assessed against these principles. Options must be discarded of they fail to meet them.

Accelerating delivery to meet 2030

All activity and the decisions stemming from this Ofgem consultation must be framed by the 2030 targets and overarching Net Zero targets. Following the 2021 Intergovernmental Panel on Climate Change (IPCC) report, it is clear that there is no time to delay[2].

The proposed delivery timeline, which aligns with offshore wind developer connections, remains unchanged. This takes account of lead time for electricity transmission investment and the time required for each of the design, development, consent, procurement, and construction stages.

It is an accelerated timeline where activity in the coming months will be vital to ensure this target is met. Specifically, it will involve the Holistic Network Design (HND) concluding in January 2022 to ensure the required stages noted above can be undertaken in time for 2030. We expect that for projects to be delivered by 2030, early development (pre-construction) work will be required within the next three years at the latest and construction undertaken in the second half of this decade. Both assume an accelerated pace delivered by those with the existing skills and capabilities to meet 2030.

The potential for delay is extended to the Detailed Network Design (DND) offshore where Ofgem state this relates to who will deliver the infrastructure offshore and what delivery model is adopted. With the ever-challenging timescales associated with PT2030 we don't believe we are afforded the luxury of time required to run a competitive tender to establish (under models four and five) who will be in a position to undertake DND offshore.

Collaboration and Coordination

As noted in our response of 16 April 2021 titled 'Ofgem offshore delivery models', we agree with Ofgem's view that coordination across a multitude of stakeholders and industry processes is paramount in seeking to achieve 40GW of offshore wind in GB by 2030 including 11GW in Scotland. We encourage Ofgem to ensure that policy decisions enable, not prevent, coordination now and in the future. Coordination is paramount to the success of achieving PT2030 objectives through strategic planning and taking a whole system approach.

We support ongoing strategic coordination to planning energy infrastructure[3]. In Scotland, this approach is being undertaken through the formation of the Scottish Government's Major Energy Projects Group, the ScotWind Roundtable and strategic planning from Marine Scotland's sectoral plan (which then informed Crown Estate Scotland's

[2] https://www.ipcc.ch/report/ar6/wg1/

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ScotWind leasing sites). The ScotWind Roundtable has brought together these elements for the key purpose of delivering up to 10GW of ScotWind generation by 2030 and it also proposed the Central Design Group. This is a similar approach to the Electricity Networks Strategy Group (ENSG) which met to address the long-term challenges to connect renewable generation.

SSEN Transmission has been at the heart of this collaborative effort to date and to achieve Net Zero, we believe policy makers, networks companies and wider stakeholders must continue to work together to create greater certainty on long-term strategic planning. If we all do, this will facilitate the whole system approach to strategic planning of energy infrastructure necessary to meet Net Zero.

The DND work provides the opportunity to plan ahead and 'future proof' electricity transmission networks in anticipation of expected connection demands while quality stakeholder engagement with local communities and statutory stakeholders can inform the delivery of assets in often challenging locations and sensitive environments. This early engagement minimises the impact to communities and the natural environment but also speeds up delivery timelines through minimising consenting timelines and challenges.

It is also vital that industry collaborates based on their pre-existing skill sets including utilising SSEN Transmission's world class HVDC Centre's expertise and testing. For a TO this would involve applying many of the same skills and expertise expected when undertaking onshore developments which map to the expected type of offshore development work. This includes taking a whole system approach to innovative technical and commercial solutions to accelerate connections.

Certainty

There is a serious risk of GB going from a leader in offshore wind development and having a key role to play in the Green Recovery from COVID-19, to falling behind and missing the opportunity for economic recovery and growth. The coordination in the development of onshore and offshore networks is significant to all consumers and stakeholders, but also of increasing important to the offshore wind developers, the supply chain and transmission operators.

Offshore wind developers require certainty of their connection point, costs, and date as an output from the HND including the onshore works, so they can progress with the investment of their own projects, including mobilising the supply chain.

The supply chain including manufacturers are limited and need a clear investment signal from GB and the regulatory framework. We are competing for resource in an already constrained worldwide marketplace and the expertise required to deliver a vast onshore and offshore network must not be underestimated. We note recent coverage in the US[4] which highlights that, due to a lack of established offshore supply chain, turbine components and cable laying vessels are to be sourced from Europe. There is a risk that without a clear pipeline of potential opportunities, the expertise and technology required to deliver 40GW by 2030 (and beyond) will not be readily available in GB or at an increased cost to in order to attract investment.

The HVDC Supply Chain Overview[5] report estimates that there will be £23.4bn of investment in key technologies required for 2030. The supply chain to deliver these highly specialised assets is limited; only a small number of suppliers globally have the ability to manufacture the required technologies, and there is a lack in scale of skilled resource required from design through to maintenance. The report highlights the need for early certainty as there will be manufacturing challenges associated with delivering the initial connections and ensuring that these will be compatible with the long-term solution.

There remains a significant opportunity for GB to develop the manufacturing and supply chain; the Scottish Offshore Wind Council's recent report on Offshore Wind Strategic Investment[6] estimates that up to 15 new manufacturing facilities will be required in the UK, six of which could be in Scotland. However, Scotland's capacity will only amount

[4] US 30GW offshore wind target 'will be missed' - reNews - Renewable Energy News
[5] HVDC Supply Chain Overview (Co-ordinated Offshore) – The National HVDC Centre
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to 5% of the global total by 2030 therefore, it is crucial that the UK supply chain has confidence to develop and win early contracts to build an international reputation. In our own experience from the Shetland HVDC link and other islands' Alternating Current (AC) links, there is minimum two year wait time from placing an order for cable delivery on site to start construction. Given the global squeeze on the limited manufacturers greater certainty is required.

We expect that a Pathway to 2030 (PT2030) solution would require no substantive legislative change, meaning that the delivered solution can be based on existing industry frameworks. A shift to a new market model of regulatory and commercial design would take years of development and may create a risk of material failure.

Several of the potential Delivery Models introduced challenge to the OTNR Policy Assessment Criteria, in particular deliverability (i.e. policy can be delivered in a timely and proportional fashion for the workstream) and deployment impact (i.e. speeds up deployment of offshore wind compared to an uncoordinated solution).

For TOs, as part of these decisions, we welcome the view from Ofgem that should the HND meet the requirements of the Initial Needs Case (INC) stage of the LOTI process it may (provided outputs are comparably robust to an INC) act as an equivalent mechanism to avoid duplication. We hope that we can move forward on that basis. We see the HND as helping Ofgem and licensees to significantly accelerate the INC stage of the LOTI process. The HND application could further replace other project requirements such as the Connections and Infrastructure Options Note (CION) and inform future Network Options Assessment (NOA) publications. Finally, we welcome that Ofgem has also included the question of undertaking a Significant Code Review (SCR) but expect that full completion of this is unlikely within the 2030 timescale. Nevertheless, we have identified a risk that the TNUoS methodology, and any uncertainty it creates, could infringe on making timely investment decisions[7].

[7] https://www.ssen-transmission.co.uk/information-centre/tnuos/

SSEN Transmission's response to Ofgem's consultation on Changes intended to bring about greater coordination in the development of offshore energy networks

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[3] US 30GW offshore wind target 'will be missed' - reNews - Renewable Energy News
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For TOs, as part of these decisions, we welcome the view from Ofgem that should the HND meet the requirements of the Initial Needs Case (INC) stage of the LOTI process it may (provided outputs are comparably robust to an INC) act as an equivalent mechanism to avoid duplication. We hope that we can move forward on that basis. We see the HND as helping Ofgem and licensees to significantly accelerate the INC stage of the LOTI process. The HND application could further replace other project requirements such as the Connections and Infrastructure Options Note (CION) and inform future Network Options Assessment (NOA) publications. Finally, we welcome that Ofgem has also included the question of undertaking a Significant Code Review (SCR) but expect that full completion of this is unlikely within the 2030 timescale. Nevertheless, we have identified a risk that the TNUoS methodology, and any uncertainty it creates, could infringe on making timely investment decisions[6].

[6] https://www.ssen-transmission.co.uk/information-centre/tnuos/

Annex: SSEN Transmissions consultation response - Changes intended to bring about greater coordination in the development of offshore energy networks

Early Opportunities

Question 1: Are there any concepts we have not identified developers (as defined in this chapter) may wish to progress?

While it is important to assess possible options, we urge Ofgem to consider whether the introduction of some models will prevent coordination in the Holistic Network Design (HND), contrary to the overarching policy objective of the OTNR. Certainty is required on what projects and proposals will be included in this workstream, and how and when decisions can be progressed. Without this clarity from the OTNR, there is a risk that projects which could have been delivered under Early Opportunities will be pushed back into the Pathways to 2030 (PT2030) workstream resulting in re-work and delays in the HND. We also question whether these models achieve the aims of the OTNR on minimising the impact on communities and the environment. Before the adoption of such models or 'pathfinders' an optioneering process followed by a full Cost Benefit Analysis (CBA) for viable options should be carried out with TO solutions as the counterfactual.

We are actively participating in the Early Opportunities workstream including working with the ESO and offshore wind developers on which 'pathfinders' are deliverable. We remain fully supportive and have substantial experience of accelerating connections and working with developers to utilise innovative connections solutions. For example, this includes: variations in connection design and "connect and manage" which TOs are experienced in managing onshore which can be managed similarly offshore; the SQSS and codes would support this approach now, and is something that needs holistic onshore and offshore management of activities).

In relation to the concepts, Ofgem appear to have identified the main options but should be mindful that some of these could be developed into sub-options with different variations of the presented concepts. For example; a Multi-Purpose Interconnector (MPI) could be integrated with other elements of an offshore co-ordinated approach (as per the phase one illustrative concepts), non GB wind may be integrated into GB offshore co-ordinated transmission or MPI projects etc. This is not to say that such an approach should be pursued, instead it is more important to have a programme that can be progressed, and to be aware within the framework that it is either encompassing or limiting these other possibilities. There are practical implications involved such as developers having the certainty to recruit based on the type of work expected to be pursued and that this is then captured within the HND rather than posing more uncertainty of what is going to be required in the longer term.

In regard to the concept 'Connection to a TO owned bootstrap' the initial Eastern Bootstrap Links are crucial in relieving system constraints (and estimated constraint costs of c.£665m per annum). Introducing design changes at this stage would result in significant risks to delivery timescales with consequential additional costs to consumers. TO bootstrap schemes with connections to the link would need to have the mid-link connections in the initial design, or for the associated controls required to be specified today, together with additional cable laid on the seabed to allow there to be enough slack to raise it and connect it into the specified mid-point platform location at a later stage. Another approach of connecting into or near to the northern onshore connection location via a Direct Current (DC) busbar arrangement would again require clear specification from the outset, and would not limit the extent of cabling involved to that location. Regardless of the detail of any new additional works, this introduces challenges in understanding the characteristics of the windfarm connecting to the link and how that would translate into satisfying a given performance requirement within the onshore transmission system. Whilst supportive of the principle of this model, this concept is only be worth considering for schemes that are in very early development, which the initial Eastern Bootstrap links are not. We welcome certainty from Ofgem on this.

Question 2: Should anticipatory investment risk be shared with consumers? If it should, what level of risk is it appropriate for consumers to bear?

Part of the OTNR assessment criteria involves allocating risk to those best placed to manage it and a comparable view is also taken in Ofgem's consultation. It is difficult to quantify the level at which anticipatory investment risk should be shared with consumers due to the varying level of project maturity, scale and certainty of delivery. Ofgem must also protect against proposed risk-sharing arrangements for projects they may have undertaken as business as usual.

While the primary objective in response to this should be that consumers do not have an undue cost on them, there also needs to be sufficient incentives for developers to work within the more coordinated approach. The risk is that without this sufficient support, they select a cheaper option of going direct to shore and fail to develop a coordinated option due to the risk profile of a particular project.

We expect that in the long run, generation and demand Transmission Network Use of System (TNUoS) will feed through to consumers' bills. This means that any assessment on the split of risk on anticipatory investment should follow all pass-through costs, to determine how much would actually be covered by consumers. Wider system reinforcements resulting from offshore development should also be factored into expected costs and subsequently what would be passed onto consumers as well. Following all of these pass-through costs, the assessment should also recognise the societal benefit of lower infrastructure costs, reduced environmental impacts, and ultimately, the delivery of Net Zero.

We also recognise the increased pressure on household energy bills and whilst we do not have a direct relationship with energy bill payers, would encourage Ofgem to consider how the most vulnerable are protected from rising costs whilst at the same time, ensure that the necessary investment in electricity networks to deliver net zero is not sacrificed. This may require changes to the current support schemes available for vulnerable households to help mitigate potential costs to the consumer associated with anticipatory investment.

Question 3: For concepts that intended to provide a wider system benefit, eg by mitigating an onshore constraint, how should the need for investment be demonstrated by the developer?

In order to enable coordination, a whole system view on onshore (and in the future offshore) system constraints is required, a single developer does not have the skills or capabilities to undertake this assessment. This would be undertaken collaboratively with developers during the HND to explore network and non-network solutions. This currently sits with the ESO and TOs in PT2030. Developers must work collaboratively with the ESO in the same way onshore TOs engage with the ESO for co-ordinated, efficient network design including optioneering and cost benefit analysis. Developers would also need to work closely with the TOs to assess the relevant parts of the onshore network.

Question 4: What options are available to developers in demonstrating a reasonable expectation they intend to connect to the system?

We expect the use of connection agreements alongside user commitment and evidence of secured seabed lease could be used for demonstrating expectation of connection. Any additional conditions beyond this could cause significant delays to meeting 2030 targets. For example our experience with the Scottish Isles transmission links and the associated conditionality for approval[7], that developers must demonstrate planning consent approvals or financial approvals (including CfDs) creates a mismatch in timelines between grid infrastructure delivery and meeting connections dates (or in this case 2030 targets).

Question 5: To what extent do you agree with our proposals to remove barriers to the Early Opportunity concepts? Please explain your answer.

[7] Ofgem encourages revised proposals for Scottish Isles transmission links | Ofgem

Ofgem has stated the barriers to this workstream are some of the codes and standards and are proposing modifications to these to overcome the barriers. If any of the six key concepts require code and/or standard changes we are concerned this will cause significant delays to the Early Opportunities workstream and these should therefore be considered outside of the scope of this workstream. While we recognise that Early Opportunities intends to bring benefits through greater coordination, the Pathway to 2030 workstream will bring more significant, long-term benefits for the consumer and the environment through greater coordination. The greatest barrier, as evidenced by the initial stages of Early Opportunities, is lack of strategic planning and coordination which the HND looks to overcome. We don't currently see the codes and standards mentioned as a barrier to coordination, rather, it is the commercial drivers of offshore wind developers and whether they have the skills and capabilities to coordinate that may be key barriers (see response to Q6). Any delay in achieving Early Opportunities creates uncertainty in the network background which could impact on the Pathway to 2030 workstream and the HND if projects' scope changes. All development within the Early Opportunities workstream should be assessed with the Pathway to 2030 goals (see response to Q1).

Question 6: Do you believe a Significant Code Review is required to give effect to a potential decision to 'share' AI risk between consumers and developers?

Given the substantial changes that are expected, a wider review of the TNUoS regime and the interdependencies that one part of the methodology has on the others will likely be required. However, given the time pressures that must be considered as part of the Early Opportunities workstream (and going into the PT2030 workstream), it is likely this will fall short of a full SCR which is unlikely to be achievable in the timescales.

Nevertheless, we welcome that Ofgem acknowledge issues with the current TNUoS methodology within the consultation, but more clarity about what a prospective review will look like to avoid creating further uncertainty is needed urgently. Through our stakeholder led advocacy work, we have provided substantial evidence outlining why the current outdated TNUoS methodology is not fit for purpose. In our view, urgent action is required to ensure that grid charging enables the critical role of industry in supporting society to transition to Net Zero, yet the current high costs, volatility and unpredictability of TNUoS is hindering its progress[8].

Even with the current level of offshore wind interest in the north of Scotland, TNUoS charges remain unknown and are almost impossible to predict which significantly increases the risks for developments. The current strong level of market demand from offshore wind developers could diminish if plans are not economically viable and charging is not transparent and predictable. This unpredictability introduces at a cost that is ultimately picked up by the consumer. As mentioned in response to Q2, the full consideration of implementing an onshore methodology for offshore arrangements should also consider this.

Our experience has seen developers in the north of Scotland face challenging circumstances in CfD bids due to being unable to forecast highly volatile TNUoS charges, which can be up to 30% of the operating costs of an offshore wind farm[9]. We're concerned that these challenges faced by developers in the north of Scotland will prohibit their competitiveness in CfD auctions and have resulting negative impacts on reaching Net Zero, ultimately increasing costs to consumers. Our stakeholder led work on transmission charges has led us to explore this in further detail. Our recently published Offshore Wind addendum discussion paper outlines analysis undertaken by NERA Economic Consultants for Ocean Winds, which has sought to quantify the impacts of cashflow volatility and CfD bid mispricing. It estimates that the risks in TNUoS charges could result in a total cost to consumers of between £122 and £391 million per year by 2030, equating up to an additional £4-14 per GB household in 2030[10]. While we expect that ESO would still lead on any proposed modifications, we advocate for collaboration in this area, with cross industry collaboration involving a range of industry participants including TOs.

[8] https://www.ssen-transmission.co.uk/media/5261/ssen-transmission-tnuos-paper-february-2021.pdf
[9] Derived from: Electricity Generation Costs 2020, BEIS, August 2020
[10] https://www.ssen-transmission.co.uk/media/5764/ssen-transmission-offshore-tnuos-addendum_.pdf

The need to avoid any unintended consequences in a review of TNUoS is paramount and will require a joint approach across both Ofgem and BEIS with full coordination and transparency around the scope of the reviews and their desired outcomes. Ofgem should especially want to avoid creating new risks and barriers when attempting to fix existing issues and so a holistic approach should be taken.

In relation to an offshore network mirroring what happens onshore, there is a likelihood of a separate wider locational charge for offshore generators. We would emphasise that this comes with a huge risk of extrapolating the issues of the already broken TNUoS locational methodology. Through our analysis it is not possible to see any rationale for the locational signal in the current wider TNUoS tariff for offshore wind developments. Introducing something similar which would follow the current methodology for onshore wider TNUoS, there will be an increase in already high costs in the north due to how the DC Load Flow (DCLF) transport model functions. These high costs for the north of Scotland could be a barrier to the developments needed to achieve the 2030 targets, further resulting in uncertainty for TOs to make timely and appropriate investment decisions which is required under our licence obligations.

The SCR is more than just a markets and charging review of equal priority, it requires clarity across technical codes to make it clear what the roles of respective developers and others involved in the co-ordinated offshore standards are in providing the performance and security on the onshore transmission system. This is most clearly achieved via specific obligations for new connectees connecting within these offshore arrangements that allow the onshore consequences of any offshore design to be fully defined, tested and maintained in operation, which can further inform the design of the co-ordinated offshore systems and their operation. To achieve this, Ofgem and the ESO should be involved in driving the review and ensure there is resource committed to progressing the required changes.

Question 7: Do you agree with Ofgem's proposed approach to deliver the objectives of Early Opportunities workstream?

SSEN Transmission is supportive of driving greater coordination to enable delivery of the UK Government's 40GW by 2030 offshore wind target and the Scottish Government's 11GW by 2030 target. We have highlighted our concerns with Ofgem's proposed approach within our answer to question 5. We have and will continue to be supportive of any Early Opportunities projects than meet the criteria set out by Ofgem to accelerate and coordinate where possible without detriment or uncertainty to the HND and PT2030 or critical strategic investment already in flight like the Eastern HVDC Link (see Q1)

Pathway to 2030

Question 8: We consider that a holistic design will result in a more coordinated, economic and efficient network. Do you agree? Please give reasons for your answer.

Yes, we agree that a timely Holistic Network Design (HND) will result in a more coordinated, economic and efficient network. It allows for full coordination between stakeholders including Ofgem, BEIS, National Grid ESO and TOs, and accommodates the 2030 renewable targets. It is important to note that a holistic design will not only result in a more economic and efficient network but will also consider the views of environmental and community stakeholders. This includes spatial planning, environmental constraints, land availability and interactions with other assets. We anticipate that this approach to the holistic design will lead to less of an impact on planning and consenting timelines which should be noted as an additional benefit of a coordinated approach.

The HND will provide a strong market signal to the supply chain and offshore wind developers, providing certainty to support and invest in GB to meet 2030 targets. Given the worldwide market demand and associated market constraints, certainty is critical as different countries work towards their own 2030 renewable targets.

The CDG Terms of Reference are clear; the HND should be delivered in full by January 2022 and any delay will be detrimental to the 2030 targets. The HND is the best way of achieving a coordinated and efficient solution provided it is delivered on time and to a sufficient standard.

We would welcome further clarity from Ofgem as to how the HND interacts with the RIIO-T2 settlement, especially the use of regulatory re-openers to allow the necessary funding for onshore development (including pre-construction). It would also be encouraging to build on the potential use of the design to define both the need and geographical technical solution and to effectively fulfil the requirements for an Initial Needs Case (INC). We note Ofgem has stated that, if appropriate, the Onshore Detailed Network Design (Onshore DND) *'should be at a level of detail that allows the TO to make a submission to the appropriate RIIO-T2 uncertainty mechanisms (eg Large Onshore Transmission Investment (LOTI)'.* We would also seek firmer commitment from Ofgem that the HND could act as part of the LOTI Initial Needs Case (followed by Final Needs Case and Project Assessment stages as Onshore DND is developed). Consistent with this view, and along with the other TOs, we expect that the HND should be used directly in the needs case to justify the required investment to Ofgem at LOTI INC stage. Also including environmental considerations as well as cost would help to accelerate the required network development. Please refer to the Annex giving a joint TO response for further details. **Question 9: Do you agree with the planned work for a detailed network design offshore?**

It is important that the HND does not enter into too much detail; the scope of the work should be clear and define what then needs to be developed through the Detailed Network Design (DND) both onshore and offshore. Over-reaching with the HND could present an additional risk by refining options without the necessary assessments and stakeholder engagement, work which will be better undertaken by whoever is responsible for the DND.

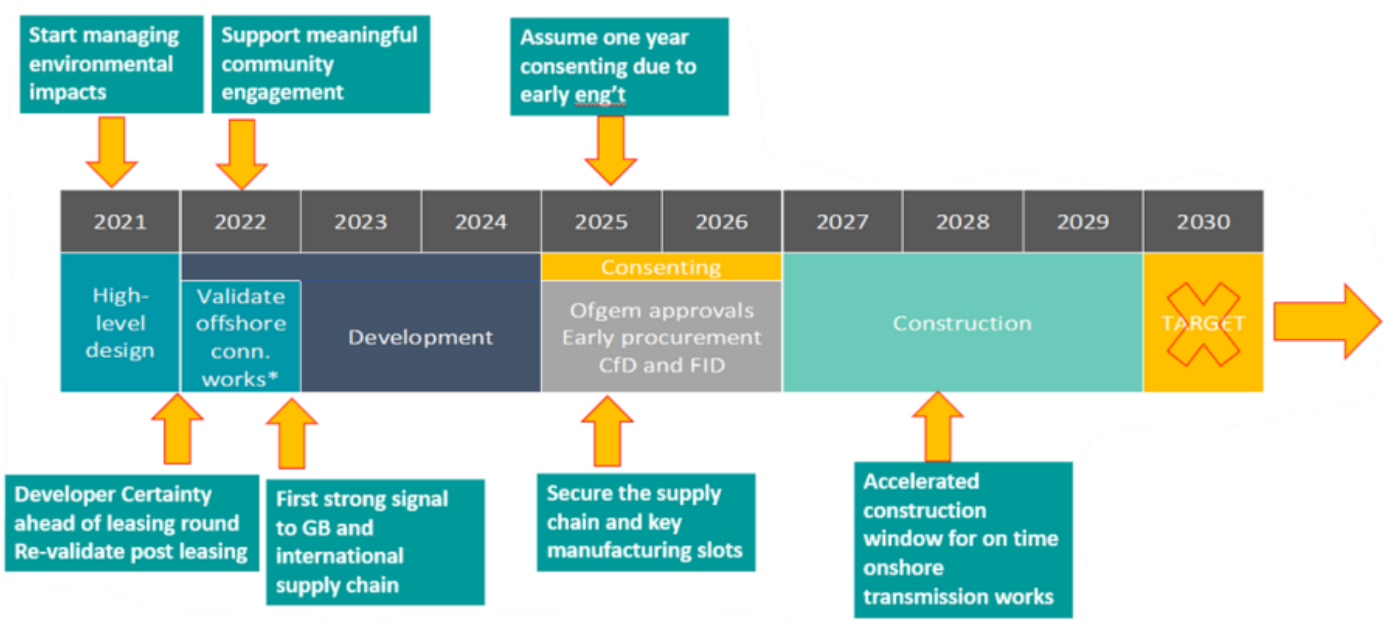

Figure 1 SSEN Transmission delivery timeline

We agree that Offshore DND should be of an equal level of detail as required onshore. Our timeline remains unchanged (see Figure 1 above) to meet 2030 targets including accelerating the consenting and construction phases. It is worth noting that our timeline aligns with offshore wind developers. The HND and DND stages cannot be delayed, otherwise this will have a detrimental impact on meeting 2030 targets. This means starting as soon as possible in early 2022.

The interactions between the onshore/offshore interface (or boundary) is also important and adding multiple parties will be more time consuming and introduce additional risk.

While the party responsible for Offshore DND will ultimately be determined by the chosen delivery model (post HND completion). This could pose a risk as the party responsible for Offshore DND will be required to justify decisions made at the HND stage through the EIA and consent approvals process, including mitigation and preparation for potential appeals and Judicial review (for which the whole project evolution/need can be examined and scrutinised for due

process). A lack of coordination, accountability or clarity on liability could significantly impact on overall consenting risk, and ability to meet 2030 targets.

With the HND concluding in early 2022, TOs can then benefit from the coordination and collaboration with stakeholders stemming from the HND. This allows for a good level of continuity, which cannot be achieved through any other delivery model. For example, in the scenario where an offshore generation customer is responsible, a coordinated approach may not be possible, or desirable for such developer due to interdependency with other customers and associated risk this presents to investment decisions.

If for example, there are multiple developers or OFTOs involved in an area of seabed with shared infrastructure, we would expect a significant amount of time dedicated to the joint venture's project set up, over which time no design work will have started and create a further pressure on hitting the 2030 target. This multi-party approach also loses coordination benefits and make standardisation difficult as well. Effectively, each attempt at a coordinated offshore system will be designed by someone different at a time when the standardisation of innovative HVDC technology will be important for future offshore network development including intellectual property of designs. It is also unlikely to include any 'future proofing' elements as we've (explained in Q8) due to the additional costs and capex to be raised by developers or OFTOs in the development stages for the sake of future connections rather than solely their own project.

Ofgem's intentions would also benefit from clearly defining the DND and pre-construction elements, especially for coordinating stakeholder engagement when one party hands over work to another. This will cause complexity for local and statutory stakeholders as they are approached by multiple parties. Further views on community and stakeholder engagement are given in response to questions 10 and 12.

Question 10: Who do you believe is best placed to undertake the detailed design for assets that are in offshore waters?

We believe that TOs have the most directly transferable competencies and experience from their onshore work to also undertake the equivalent DND for coordinated offshore assets. This will also become especially clear should their transmission area be extended offshore as part of facilitating offshore connections. The clearest solution is to maximise the use of existing competencies. TOs can essentially provide DND with the experience of both grid management and the marine environment as well, having relevant technical capability and an understanding of offshore technology. The alternative is offshore wind developers, who do have the skills and competencies to take forward the DND for sole-use offshore assets, however, there is a risk that this approach will prevent coordination and collaboration.

We do not believe that with the ever-challenging timescales associated with PT2030, we are afforded the luxury of time required to run a competitive tender to establish (under models four and five) who will be in a position to undertake DND Offshore. It is also unclear whether these options offer increased coordination. As a comparison, our analysis of NGESO's Early Competition Proposal (ECP) expects that delivery of transmission infrastructure could be delayed by 18 months compared with the RIIO counterfactual. This results from the multiple stages of the tender process and preliminary works being undertaken post these stages. Such a delay is simply incompatible with the timeline that infrastructure required to connect generation to meet 2030 targets.

Successful and timely delivery for 2030 is reliant on having the right competencies applied at each stage of the process. This should either come from the pre-existing bodies who can provide these skills or the quick scaling-up of the required expertise. We expect the required coordination to achieve the 2030 target will be best supported by the responsible party for DND also taking on the following responsibility for consenting as well, which would also be consistent with the ESO from their early competition plan[11] view on the potential application with onshore competition. We would propose that if Ofgem want to achieve holistic system coordination then it should consider

[11] Early Competition Plan Project | National Grid ESO

how onshore detailed network experience will transfer to offshore as well. This has added importance when considering the interface between them.

In appointing the responsible body, Ofgem should consider the need to have contextual information to ensure successful delivery, in particular for delivery in the north of Scotland. Information of the challenging locations and topography, sensitive environments, transmission specific environmental impact assessment, and logistics of transporting assets through these areas need to be considered when delivering solutions.

The knowledge and expertise that SSEN Transmission has developed allows for planning, environment, and stakeholder risks to be considered early on in project development. Key influencing factors are therefore understood, controlled and resolved in such a way that streamlines and de-risks the consenting process. This, coupled with the long-term relationships developed over many years with consenting bodies, statutory authorities, Non-Governmental Organisations, elected officials and community groups, places TOs in a unique position to judge the most effective route to successfully balance what are often competing priorities.

Considering this contextual information is another area where SSEN Transmission has offered examples including the benefit of local stakeholder relationships as part of our Lairg to Loch Buidhe overhead line (OHL) project[1] which demonstrated the importance of practical knowledge, expertise and consistency to deliver projects in sensitive areas and work with a wide variety of stakeholders.

The Lairg to Loch Buidhe project comprised of an OHL and substation within a NATURA site (international designation) for protected bird species. There were competing priorities between Scottish Natural Heritage (now NatureScot), SEPA and the local community. Nature Scot preferred one route to avoid increasing the risk of bird collisions, SEPA had concerns over impacts on peatland and hydrology, and the local community were opposed to the route favoured by NatureScot due to the landscape and visual impact on the village. Ultimately our knowledge of the environmental factors, local priorities and appropriate technical mitigations and alternatives allowed us to reach a compromise that successfully avoided statutory objections and appeals which would have added years of delays.

Our track record over the last decade has had no development consents refused through the planning system and are recognised by many of our local stakeholders as setting the standard on effective engagement. Having the oversight of a portfolio of works within a given region also allows us to build day to day working relationships with each of the key consenting bodies and statutory authorities allowing process improvements to be openly discussed, developed and implemented quickly and consistently across our portfolio. Examples of these are standard assessment methodologies for OHL landscape and visual assessment, and species protection plans appropriate to the North of Scotland, which are agreed upfront for all of our projects.

The benefits of consistent approach of high-quality standard and common expectation of construction environmental management may be lost if individual third parties are delivering solutions on a piecemeal basis. This may be equally disruptive for the local environment and key stakeholders.

Question 11: Do you agree that the existing developer led model should be retained and applied where the HND indicates a radial solution should be used? Please explain your answer

No. Ofgem is considering changes that will enhance coordination and provide a more strategic approach and we do not believe developer led models should be retained longer term. An analogy is that we are working towards an offshore network to transport an increasing amount of offshore wind traffic, the most efficient solution is therefore a coordinated offshore system or an ‘offshore motorway’. To be progressing an ‘offshore motorway’ alongside the previous model of privately owned smaller roads could result in lack of coordination and prevent the full benefits of ‘offshore motorways’ through taking up limited physical space and preventing future coordination.

To fully achieve the benefits of this, we think that where radial links are identified as the solution they should be included as part of the selected delivery model. Continuing with current arrangements when differing from an alternatively selected delivery model would leave these as an outlier and risk multiple assets and landing points which a strategic and coordinated approach otherwise aims to avoid. The use of a purely radial connection approach, rather than the HND approach, would place significant constraints on key landfalls and associated onshore infrastructure, where multiple developers develop sections of a single block and make landfall in the same location.

Looking wider, the lack of a strategic approach to subsea cable route selection could result in increasing numbers of cable crossings and the cost and risk that these create. This is contrary to, such as DNVGL-RP-0360[12], that advise that subsea cable crossing should be minimised.

As discussed in The National HVDC Centre's R&D strategy for HVDC development[13], and in the holistic planning report, different cable designs, and their operation, can lead to different technical mitigations. For example, compass deviation, which should be co-ordinated across projects in areas of congested cable installation rather than left for individual entities to take forward in isolation. A further issue noted in these two reports and expanded upon in a joint report by the HVDC Centre and RTE international[14], is that if a radial connection still connects a number of wind farms offshore, using different turbines, operated by different parties, co-ordination is needed in the design of the control systems across the HVDC convertors and the wind turbines within the radial arrangement to avoid instability within that arrangement.

This would also be expected to prevent future strategic coordination and design of that asset if the future needs of co-ordination were not clear at the time of the original development. A radial connection could be a logical choice to begin with which then extends to be integrated into a co-ordinated solution at a later time. Doing so could limit the extent of impacts to coastal communities and sub-sea cable congestion that may otherwise result. Where a radial connection is currently used, there is scope for these to be connected to further offshore wind developments in the future provided these future uses are envisaged and catered for in that original design to provide the future flexibility. Offshore wind in future leasing rounds could be close to initial lease areas with the option to incorporate these into extensions of existing infrastructure being key design decisions which limit cost, speed up delivery and minimise environmental impact. A risk of maintaining a separate regime for radial arrangements not subject to initial co-ordination is that these projects would develop in isolation to others and be more closed-off to extension in their design. If this was to come at a later point, more expensive changes would then be in incurred. The HND is currently being developed but we would be happy to share co-ordinated versus radial approach designs.

Whether radial or integrated in the outset, the offshore wind can be expected to be holistically planned within the onshore system, interfacing to more extensive forms of wide area control and their access and operation needing to be co-ordinated to maintain the operation of the overall strategic design including radial aspects. The co-ordination across offshore operators and the complexity of operation would need to increase.

Question 12: Please provide your views on each of the delivery options we have described in this document. In providing your views, please comment on the issues we have raised. Please also give your views on the implementation issues we have raised.

The application of different models will be reliant on the finalised work from the CDG and an expectation of what is intended to come from the HND and it combining the existing expertise of both the TOs and ESO. The outcomes of the CDG will give the best opportunity for innovative and whole-system solutions. Please see the TOs joint response on strategic planning and the HND.

[12] https://rules.dnv.com/docs/pdf/DNV/RP/2016-03/DNVGL-RP-0360.pdf
[13] https://www.hvdccentre.com/wp-content/uploads/2021/07/Offshore_Co-Ordination_RD_Strategy_v2.0.pdf
[14] https://www.hvdccentre.com/composite/

As outlined in our executive summary we have based our review of the individual delivery model options in this response on the following principles. Policies that are introduced should:

1) **accelerate**, not delay delivery of 2030 targets;
2) enable **coordination** and **collaboration**; and
3) provide **certainty** to consumers, stakeholders (including offshore wind developers and onshore TOs), and the supply chain.

All policy options for development of a holistic onshore and offshore network design and delivery of offshore (and onshore) infrastructure must be assessed against these principles. Options must be discarded if they fail to meet them.

Summary

Models 1 and 6 **closely align with the principles SSEN Transmission set out** and lend themselves to the existing competencies of TOs and offshore wind developers for the offshore network detailed design and delivery. Model 1 specifically aligns with TO network design and operation competencies, and licence areas, being extended offshore to deliver strategic infrastructure.

Model 1 has the capacity to enable **greater coordination and collaboration** by replicating the onshore arrangements whereby TOs deliver shared use infrastructure with developers retaining the option to develop and deliver sole use assets connecting into the shared infrastructure. This arrangement would also then retain some element of competitive tendering. Model 1 can also be envisaged with an extension of current TO transmission areas offshore. As well as being a recognisable extension of the current transmission area, this would also expand on the existing experience TOs have developed for taking work offshore as well. Further details of this are given in our review of delivery model 1.

Model 6 has some familiarity with current arrangements i.e. the pre-construction, construction and operation for developers and OFTOs. Offshore wind developers do have the skills and capabilities to develop and deliver offshore assets, however our concerns centre around the **lack of coordination and strategic planning** for the whole system. We are concerned with OFTO responsibilities and capability in network operation assuming the role was expanded to include offshore shared assets (rather than sole use) without accompanying reforms, this could prevent future coordinated for offshore development. OFTOs do not currently have the network operation and management skills and capabilities, including asset management, for shared use infrastructure or 'networks' which could pose a risk to consumer reliability and network integrity introducing uncertainty to consumers, offshore wind developers and onshore TOs.

As noted in previous submissions, since the introduction of the current OFTO regime no developer has selected OFTO build ahead of developer build. So, while this is represented in the potential delivery models, Ofgem's assessment should include considering whether offshore wind developers are willing to concede ownership and responsibility for their connection to an unknown third party. In our view this model **does not align with the principles we set out**.

The potential for a competitive tendering process at any stage of the noted delivery models is likely to **add delay** to the eventual asset delivery. It risks introducing unwanted uncertainty for those wanting to connect to the GB Transmission network but also for the supply chain who will undoubtedly be experiencing increased global demand as nations around the world establish their own targets to increase renewable capacity. The journey to Net Zero requires a generational scale of development. The limited supply chain requires a certain and centralised strategy so it can provide the scale that GB requires to meet Net Zero at pace. **This approach causes a risk to the principles set out on accelerating delivery and providing certainty.**

As noted above, the supply chain for transmission assets, including manufacturers, is limited and needs clear investment signals from GB. A handful of manufacturers and suppliers worldwide can produce transmission and high voltage equipment. There is a real risk that, without a clear pipeline of potential opportunities and clear Government and regulatory policy, the investment required for innovation and expertise required to deliver Net Zero targets by

2030 (and beyond) will not be readily available in GB, or will be at an increased cost as investors manage the uncertainty through demanding higher returns[15].

Any assessment of offshore competition models must include detailed analysis of the potential wider impact and cost of failure. We continue to be concerned with the absence of such fundamental evaluation by Ofgem and BEIS in addressing these very real and critical issues of how to address network need, should a third-party solution fail, or a tender exercise be unsuccessful. Competitive benefits should be considered alongside potential significant costs of transferring liabilities and maintaining reliability and security on the network and that would otherwise be **lost through a more centralised and coordinated approach.**

1. TO Build and Operate

Accelerating delivery to meet 2030

Knowing the network design and operation competencies of TOs are ready to be applied will minimise any reassessment of such responsibilities which aligns with need for achieving the 2030 delivery target. Alongside our strong track record of delivering project on time and on budget throughout RIIO-T1 including working with customers to accelerate connections.

As outlined in Figure one (see question 9) our timeline already assumes accelerated consenting and construction to meet 2030 targets, this also aligns with offshore wind developers, leaving no time for delay.

Coordination and collaboration

We support Ofgem in correctly noting the benefit that Option 1 offers as a good opportunity for coordination given the limited number of parties (2) involved across the entire of the delivery phases. The HND and DND phases especially, are managed by known parties with the relevant competencies for such requirements as well – Model 1 aligns with the network design and operation competencies of TOs. We also agree that the absence of offshore transmission referenced in RIIO-2 should support this option but more insight would be welcome on which re-opener mechanism provides the best route depending on any other circumstances.

As the current OFTO regime applies only to radial links, no party has experience in delivering coordinated offshore networks. The TOs however, have experience in all of the elements required; design, consenting, construction and delivery onshore and offshore including collaborating to manage marine environmental impacts therefore, we also disagree with Ofgem's view regarding TOs not having offshore competencies.

The Shetland HVDC project, which is currently in the construction phase, will deliver an HVDC link between mainland Scotland and Shetland. The project will consist of; around 260km of cabling; 10km is onshore with 250km subsea, a 320/132kV substation and HVDC convertor station and a HVDC switching station. This will enable renewable generation to connect to the network and will link Shetland to the mainland. This follows effective optioneering, consultation, consenting and delivery of the Kintyre Hunterston and Caithness Moray projects as well as development projects including Orkney and Western Isles which are largely consented but not yet delivered due to lack of developer certainty and commitment. A detailed Front End Engineering Design (FEED) was also completed in 2012, covering the design of an offshore HVDC hub. This project was funded under the European Energy programme for Recovery (EEPR) and a knowledge sharing session was held in 2015 to share key project outputs across the industry.

[15] https://utilityweek.co.uk/ccc-chief-points-to-lack-of-scrutiny-on-net-zero-policy/

This should be considered as part of TOs experience of managing future workbooks and ensuring delivery across the delivery of multiple projects. These are not just in the most immediate term but also in offshore HVDC which the Shetland HVDC and Eastern link already illustrate.

In terms of collaboration, as outlined in the executive summary, we have a strong track record of working with customers to accelerate connections using innovative commercial solutions. As part of Ofgem's new Strategic Innovation Fund, we're developing an innovative concept that will explore the feasibilities of installing the first DC Circuit Breaker on the GB network. The project will involve expertise from the National HVDC Centre, National Grid ESO and include input from selected Original Equipment Manufacturers (for example Siemens, ABB, GE etc.).

SSEN Transmission has previously shared examples[16] of how TOs take a holistic view to future proof the development and implementation of their networks to realise efficiencies and reduce costs for consumers. These solutions are evidence based and require significant coordination with relevant stakeholders. TOs have an overarching view of their network and ongoing portfolio, allowing it to find efficiencies and synergies for load and non-load related works on its network to find the optimal solution for consumers. This ultimately delivers reliability, sustainability, security, and cost benefits to consumers.

Previous such examples include how SSEN Transmission's coordinated development and implementation of The North East 400kV Reinforcement Scheme and East Coast kV Project approved by Ofgem as part of SSEN Transmission's RIIO-T2 Business Plan, benefited consumers and communities.

For the North East 400kV Reinforcement Scheme, a number of scenarios were devised and compared via a Cost Benefit Analysis against the benchmark dates. When compared against the baseline option, SSEN Transmission's approach demonstrated a Net Present Value saving of £45.73m and removed 70 weeks of future outages from the transmission network post 2023. This coordinated approach demonstrates significant value for consumers in terms of costs, but also reduction of risk of electricity supply failure for consumers.

For the East Coast 400kV Project, SSEN Transmission combined the replacement of insulators and conductors at the same time. In doing so SSEN were able to offer a Net Present Value saving of £15.82m and removed over 50 weeks of outages following 2026 by undertaking this approach. This coordinated approach demonstrates significant value for consumers in terms of costs, but also a reduction of risk of electricity supply failure for consumers.

As detailed in the response to Q9 we also anticipate there are benefits to having continuity between the party responsible for Offshore DND and being closely informed by decisions made at HND stage. This is another addition to the coordination that will help meet PT2030 targets. Concluding the HND in 2022 will benefit TOs in the coordination coming from this.

To complement the holistic view that TOs can take, we also have the benefit of longstanding community and stakeholder relationships. These exist at the community level, as detailed in the response to Q10, and also with industry stakeholders, such has been the case with the HND development and establishing the ScotWind Roundtable.

Certainty

Despite not having a competitive element as explicit as some of the other proposed delivery models, we expect delivery of this approach to mirror what is already done onshore. As part of the connections process, the developer

[16] Please refer to projects included within our response of 15 February 2021; SEN Transmission response to National Grid Electricity System Operator's Early Competition Plan ('ECP') Phase 3 consultation.

can choose who does the work for sole use assets. This means there is scope for a degree of competitive tendering while still providing certainty in retaining features of onshore delivery too.

Responsibilities being retained with TOs will also allow their experience to be applied in stakeholder and community engagement as well as taking a strategic view to minimise impact on communities as well.

We would also caution Ofgem taking a view that this is a shortcoming specific to TOs when arguably the inexperience applies equally to all potential parties – no one has experience of developing offshore *networks*. The OFTO regime currently applies to radial links only rather than any meshed or interlinked and interconnected network as may develop under OTNR. TOs do however have onshore experience, SSEN Transmission also has significant experience offshore outlined above, which has transferability to offshore.

The above in addition to accelerating delivery to meet the 2030 targets will provide greater certainty to the supply chain and offshore wind developers.

2. TO Build > OFTO Operate

Accelerating delivery to meet 2030

The competition element may have merit in discovering the best operating solution but this also needs to be framed in the context of the 2030 timescale. This is an accelerated timeframe unlikely to be able to contain the competitive tender process as part of this model. For example, the OFTO tender process for Beatrice took two years to complete.[17]

Coordination and collaboration

Option 2 dilutes opportunities for coordination by introducing an additional party (OFTO) to full delivery and including a very late competition element. Additional parties will add complexity to coordination efforts while the very late competition element introduces uncertainty over liabilities and obligations as part of the asset handover. We would also question whether the future coordination of assets has been considered in this option, once an OFTO is appointed will there be any scope for future reinforcements or changes. OFTO experience has so far been a single use point to point cable for one developer rather than managing assets of an offshore network.

Certainty

The questions around liabilities and obligations is at least manageable for the most part where operation is the only point where the OFTO is involved. However, it is unclear why the involvement of an additional party would be pursued if it also introduces questions about interoperability, maintaining reliability, and creating uncertainty for consumers and onshore TOs.

We would also request further detail and certainty on how assets would be maintained and invested in to include future reinforcements accommodating future offshore wind connections. In the above summary and in response to delivery model 1 we also explain concerns around OFTO network operation skills and capabilities.

3. TO Design > OFTO Build and Operate

Accelerating delivery to meet 2030

Even if going to plan, the use of late competition would be a factor in compromising the 2030 delivery timeline, again being unlikely to accommodate the required tender process within this accelerated timeline. As noted above, the OFTO tender process for Beatrice, which does not include OFTO construction took two years to complete.

Coordination and collaboration

Option 3 is another where an increased number of parties in the full delivery introduces reduced opportunities for coordination. The division in responsibilities should also consider the incentives promoted as well and whether they

[17] Agreement for sale of Beatrice transmission assets | SSE Renewables

lend themselves to full collaborative efforts. The party responsible for consenting will not carry the requirements for any associated obligations being deliverable, and potentially pass-on subsequent problems to the party responsible for construction. The proposed delivery models stages could also end up being undermined if the OFTO needed to undertake consenting work as part of ensuring that the expected liabilities were correctly understood for the construction phase. As well as this, the assurance on confirming the best route has been established would further add to the overall development timeline.

Certainty

We agree with Ofgem that using the competencies of the ESO and TO for the HND and DND respectively is efficient.

It is also necessary to understand whether OFTOs have the necessary locational knowledge (including environmental) and relationships with interested stakeholders (see examples of TO coordination under delivery model one). These areas of knowledge and relationships take time and experience to develop and build trust. This could be another factor in the use of new delivery models taking time to mature. This could also have adverse impacts on other infrastructure providers in those areas because of poorly managed stakeholder engagement.

In this instance too, the proposed model does not offer the needed certainty with the issue of responsibilities and obligations albeit at an earlier stage between consenting/constructing. It's also unclear what appetite there will be for OFTOs to take on construction and operation responsibilities after consenting has been finalised.

4. Early OFTO Competition

Accelerating delivery to meet 2030

Even after it being settled on whether the ESO or TO provides the detailed design, a coordinated approach would be challenging for two organisations working across the respective detailed design and consenting stages. This split in responsibility will not result in parallel works being undertaken on both workstreams. Splitting of works would lose the programme benefits required for meeting the 2030 target. This arrangement introduces substantial risk of delay that would be avoided with a single party better providing a coordinated view across both detailed design and consenting.

Delivery for 2030 could also be challenged with the time required for competitive tender. Again, this also needs to be compared with the NGESO's Early Competition Proposal (ECP) expecting that delivery of transmission infrastructure could be delayed by 18 months compared with the RIIO counterfactual for when a full competitive tender is used.

Coordination and collaboration

Since option 4 currently shows the potential for ESO or TO responsibility for DND, this should at least be settled as sitting with the responsibility of TO and would be consistent with the coordination benefits captured in the CDG terms of reference. Following the ESO separation from National Grid TO, the required experience for the detailed design remains with the TOs.

Certainty

While the OFTO remit is extended further, we agree with Ofgem's observation that it remains uncertain if an OFTO would have the appetite for taking work from the pre-construction stage after not being involved in the DND. Although no developer has chosen the OFTO build option we would question whether current arrangements allow OFTO to take on responsibility before the construction stage which does not align with the OTNR's objectives for PT2030. This position would likely be influenced by the expected issues noted above on the split in detailed design and consenting stages

We agree with Ofgem that there is an unknown appetite which also indicates the potential for reliability and interoperability challenges where work is split between parties.

5. Very Early OFTO Competition

Accelerating delivery to meet 2030

This delivery model shares concerns with models 2-4 around OFTOs needing to collaborate with TOs during the DND to ensure any onshore impacts were considered. There would also be a requirement to collaborate with TOs during the DND to ensure any onshore impacts were considered. Without this, it would invite risk in terms of achieving the 2030 target. As noted above we would question whether current arrangements allow this model.

Coordination and collaboration

With just two parties involved, it can initially look as if there is a better case for achieving a coordinated approach. This is probably reduced however with OFTOs being required to take on work not expected as part of their legacy work – especially around the development of DND. There would also be a requirement to collaborate with TOs during the DND to ensure any onshore impacts were considered and remove uncertainty about operability.

Certainty

As well as the issues above requiring OFTO involvement there are also currently critical decisions being made on the HND that would require OFTO involvement to understand which measures they would need to adopt for delivery and the liabilities being taken on as well.

6. Developer design and build, OFTO operate

Accelerating delivery to meet 2030

We agree with Ofgem that there are strong parallels with current arrangements, and this lends itself to a straightforward implementation in terms of delivery. However, this review should be taken as an opportunity to find an alternative which uses existing competencies but provides the capacity for reaching the 2030 renewable milestones. The use of very late competition also adds to the challenge of achieving the accelerated 2030 timeline.

Coordination and collaboration

On the point of existing competencies, the detailed network design work does not best lend itself to being undertaken by the Offshore Generator given there may be shared use infrastructure within the design. Although it does offer a good opportunity for the same party to achieve good coordination through the consenting and construction phases of individual projects. However, consenting and construction will be undertaken by individual developers, losing the opportunity to take a holistic approach to consenting, construction and minimising the overall impacts to communities and the environment. There should also be a realistic perspective taken on the capacity for this model to deliver a coordinated approach as well and if this hasn't been achieved so far then it is unlikely to do so when under even greater pressure to deliver this by 2030.

Certainty

Given this is the current arrangements it does provide certainty to offshore wind developers and the supply chain. However, we would question whether it would provide certainty to environmental and local communities as engagements and impact assessment will be for individual projects rather than taking a holistic and coordinated whole system approach. We also have some concern with OFTO responsibilities in network operation if such a role was expanded to include shared offshore assets.

Question 13: Please describe any feasible delivery options that we have not set out in this document.

In the interests of furthering the OTNR principles, especially around coordination and using existing competencies, Ofgem should consider implementing an extended Transmission Area for TOs. This would allow them to provide a connection point/hub for offshore generation to connect to.

There are also comparable options proposed in Europe which would present this arrangement this includes Ireland[18] and France's recent policy decision to move towards more coordination. We set this out to illustrate how arrangements considered under Delivery Model 1 can be comparable to known onshore arrangements of providing connection points for generation. Adding to a coordinated approach, this also make use of existing TO experience in taking connections offshore such as Shetland and Caithness-Moray and the regulatory arrangements of extending the defined Transmission Area for these projects too. With these points considered, it becomes easier to envisage how TOs could provide a coordinated solution based on current knowledge and expertise while retaining an element of competition and developer choice for the offshore wind farm in developing their own sea cable.

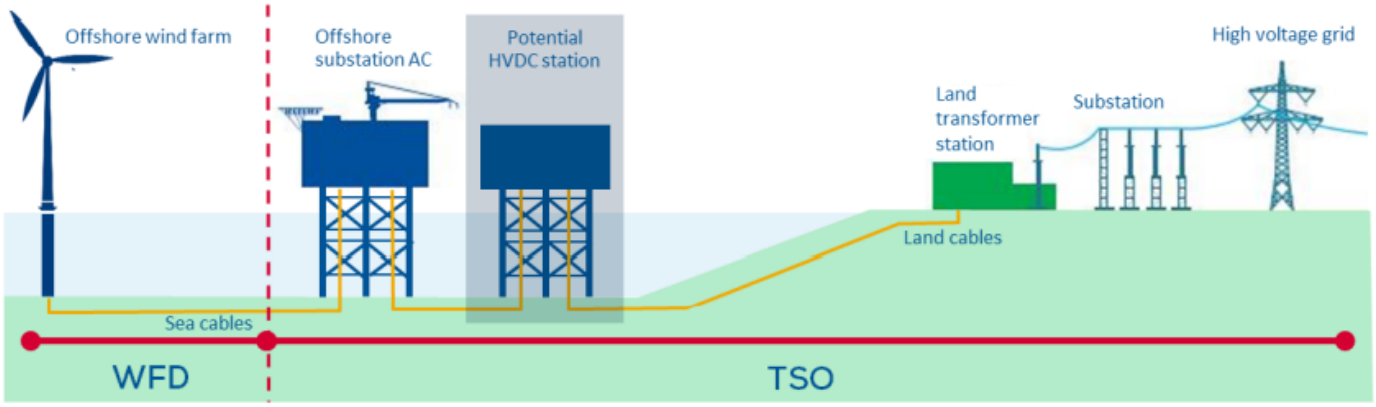

Figure 2: Taken from Wind Europe 'Offshore Transmission Models in Europe' from OTNR's Teach in.

Multi-purpose Interconnectors

Our response for the MPI workstream has been closely informed by technical expertise provided by our HVDC Centre. The National HVDC Centre is owned by SSEN Transmission and is Great Britain's simulation and training facility for HVDC, supporting the integration and successful operation of all HVDC schemes connecting to the GB Network. The Centre is also the national hub for HVDC knowledge exchange, expertise and innovation.

Question 14: Do you think we are focusing on the right models at this stage, or are there other models we should be considering? Is it also necessary to consider the evolution of such MPIs from pre-existing assets? Ultimately, should Ofgem accommodate multiple MPI models (eg IC-led and OFTO-led) or just one? What factors influence your answer?

Overall, the two proposed models are in keeping with the proposals we would expect.

While we understand that factoring in pre-existing assets is one route to informing the use of other MPI models, as noted in the response to question 1, TO bootstrap, or TO-led MPI scheme, with connections to the link would need to have the mid-link connections in the initial design or for the associated controls required to be specified today. This option could be retained to consider the retro-fitting of existing assets but should otherwise have a clear specification from the outset; it should encourage having the right functions needed and capacity for an MPI at an early development stage.

[18] https://www.gov.ie/en/publication/5ec24-policy-statement-on-the-framework-for-irelands-offshore-electricity-transmission-system/

This option would also have to demonstrate it offers the best solution in terms of providing an economic solution that is also supported by the cap-and-floor mechanism to minimise the exposure of consumers to lower than expected use.

Clarification is needed for the expected capacity of any MPI making a connection as well. This would help inform what is expected in a similar way as there being rules and expectations for offshore wind connections. As with other aspects of the multi-purpose MPI workstream, we expect this to be better informed as and when there are firmer definitions of what is being built.

Question 15: Do you agree with this position with regard to ownership structures of MPIs under the current framework?

While the consultation has set out the expected ownership and licensing arrangements for MPIs, Ofgem should also intend for these to be compatible with any future coordinated approach including coordination with onshore TOs. Since this could also include generation from another territory, we expect this would need revisiting as more is known about future arrangements.

Question 16: What are the commercial, operational and regulatory factors that would drive a developers preference for either the OFTO-led or IC-led MPI model? and do you envisage a different usage of the component assets of an MPI depending on the MPI model?

We agree with Ofgem that factors such building sequence or familiarity with the regulatory regime might inform a preference.

Question 17: How would the line to shore (L1) be used in practice and what would you consider to be the primary and secondary activities from a practical perspective? Please provide views for both the IC-led and OFTO-led models, highlighting any differences between L1 usages across the two models.

We expect a more informed view can be taken here when it is better understood how these assets will be regulated and any associated incentives. This will need to factor in the capacity that is allocated between offshore generation and that coming from other territories. If this is unclear then it will be unclear what the developer is committing to.

Question 18: Are there any barriers within the current frameworks, such as definitions within the CUSC, SQSS or other industry codes, that might prevent the line to shore (L1) being classified as either an OFTO or an interconnector while undertaking other secondary activities?

Any barriers within current frameworks are likely to be better addressed with firmer definitions of what is being built and the purpose of it.

The SQSS would need to be clear on how it treats MPIs to then inform the capacity and load factors to be planning for onshore.

Given the cross-territory character of MPIs and the issue of industry codes, there also needs to be consideration beyond GB. The Emergency Restoration Code[19] would mean a Transmission System Operator (TSO) in Europe could take action to either limit or force capacity at their end without it being clear what it means for the connected offshore windfarm or what needs to be planned for in GB if such an action occurs.

Question 19: What are your views on the feasibility of adopting a regime that requires developers to submit evidence to support their licence application (for assets that form part of an MPI) and commit to regular

performance reports? Would this be practicable, proportionate, and effective? Are there other options that work well for industry that we could explore further?

If current reporting is in place then it should be possible to have an equivalent regime. However, Ofgem are right to consider that any regular and enduring requirements are not unnecessarily burdensome and add value.

Question 20: What are your views on the practicality of transposing obligations from one licence into another, which obligations would be the most important to incorporate into a remaining licence?

It is important to note that the transposing of different licence conditions is unlikely to overcome the practical concerns of resolving any interoperability questions.

As asset responsibilities change then it is likely that highly sensitive Intellectual Property (IP) that is engineered into the hardware and controls of the asset would need to be revealed and understood. This level of sensitive information being shared in a secure and trusted way should be expected to be a challenge and so should have its own solution in place.

Question 21: Do you think the exemption provision with the Act offers any solutions to licencing MPIs within the current framework, even if only a temporary solution until a potential enduring solution is implemented?

No comment.

Question 22: Are there any aspects of the priority dispatch and curtailment arrangements, the TCA, or the cross-border trading arrangements that are adopted in UK that might influence the choice of MPI models?

While these aspects shouldn't necessarily influence the model selection, they should inform the efficient design of a project regardless of the parties involved.

BEIS Question 1: What do you consider to be the key challenges to the establishment and operation of MPIs in the UK presented by current and proposed regulatory requirements applicable in EU Member States or other countries which MPI projects may connect with, or by the TCA? (eg regarding the efficient operation of MPIs under both the Home Market and Offshore Bidding Zone approaches). Are there further domestic challenges to these possible market design option.

It is going to be essential to recognise the need for offshore gird codes to provide consistency to design and operation in GB since MPIs need to be able to connect to each other or other offshore assets as part of a coordinated approach.

When considering the definition of MPIs it is also necessary to consider how these may differ from other potential approaches that may emerge in the future. Having a sharply defined term of what constitutes an MPI well help delivery and then allow later consideration of future solutions that might include trans-national mesh networks or hub DC grids. Finding this definition would then help to avoid any further developments being prohibited.

Annex: Joint TO OTNR Strategic response

Neil Copeland (Ofgem)

Christian Glenz (BEIS)

8 September 2021

Submitted by email

Dear Neil and Christian

Consultation on changes intended to bring about greater coordination in the development of offshore energy networks

This joint response is on behalf of National Grid Electricity Transmission, SP Transmission and SSEN Transmission. As the three incumbent Transmission Owners (TOs) in GB, we are pleased to be part of the Central Design Group, supporting the Electricity System Operator (ESO) on the Holistic Network Design (HND) for the Offshore Transmission Network Review's (OTNR) Pathways to 2030 workstream. The intent of the Central Design Group and the HND is to provide certainty and accelerate the delivery of the onshore and offshore network requirements for the 2030s in a coordinated way.

Each TO will also be submitting their own individual responses to the above-mentioned consultation.

Delivering the 40GW offshore wind target by 2030

Delivery of the UK Government's 40GW offshore wind target by 2030 not only requires significant offshore network infrastructure solutions, but also the timely development of a significant amount of major onshore development works and reinforcement to the existing GB onshore electricity network. The electricity network, including the onshore transmission network, is a key enabler for meeting the Government's Net Zero target by 2050. The demanding carbon budgets, Net Zero target pathways and bold political commitments mean that time and scale pose the biggest challenge to delivery. Collaboration and support across industry, with central and devolved Governments, and with Ofgem, will be fundamental to success.

The scale of investment required and short timescales mean existing processes which have historically served us well, now require swift change. The OTNR aims to address this by setting out the onshore and offshore electricity network infrastructure requirements through a HND. We support the ambition of the HND to set out the 2030 grid requirements by January 2022. However, the view of the TOs is that wider regulatory and planning processes also need to be concurrently reviewed and aligned with the OTNR's work and pressing delivery timelines.

We have outlined below, further areas within existing regulatory and planning processes, which we consider require reform and support from BEIS and Ofgem to facilitate the successful and timely delivery of the OTNR work to deliver 40GW of offshore wind by 2030:

The HND must be clear and consistent with the outcomes of future Network Options Assessments (NOA) to provide certainty and confidence in development, consenting and deliverability of key strategic infrastructure.

Under the current framework, the initial recommendation for anticipatory major network infrastructure is determined through the NOA, performed by the ESO, on an annual basis. However, this existing NOA methodology which is intended to guide investment against an uncertain future by providing single year investment signals, against an evolving set of Future Energy Scenarios, does not align with the intent of the HND which is to provide certainty on the onshore and offshore network requirements for the 2030s. We are therefore strongly of the view that the recommended HND must form the inputs to future NOA publications. We believe that the NOA methodology should therefore be reviewed now, to allow for the HND recommendations to form part of next year's NOA - NOA7, as well as all future NOA publications.

We also recommend that the outputs of the HND should replace the need for regional or individual Connections and Infrastructure Options Note (CION) process for any projects in scope of the HND development. This would allow offshore wind developers to have confidence and certainty in the transmission investment necessary for their connection following the completion of the HND in early 2022.

Certainty of the network need and investment signal is required now for TOs to ensure timely delivery of the onshore network infrastructure required to achieve the Government's 40GW offshore wind targets by 2030.

NOA provides an economic signal to progress delivery of network infrastructure for the forthcoming year, and for larger network infrastructure, this is often supported through Ofgem's Large Onshore Transmission Infrastructure (LOTI) process under the RIIO-T2 price control. However, neither the NOA or LOTI processes provide sufficient certainty to TOs, and other key stakeholders, at a suitably early stage, in order for schemes to progress to delivery. For example, the annual NOA review process introduces uncertainty for manufacturers in committing capacity for GB schemes and makes it more difficult for communities to engage in discussions in detailed development plans. This issue is exemplified further given the scale of onshore infrastructure to be delivered by 2030, to meet offshore wind targets.

We are strongly of the view that the recommended schemes from NOA6[20] (published in January 2021) form the best opportunity to deliver the required onshore infrastructure by 2030 as these schemes are already under development by TOs, in line with the NOA6 recommendations. These schemes should therefore be considered by Government, Ofgem, the OTNR members, and wider stakeholder groups as the 'baseline' for the HND, providing a strong foundation for both onshore and offshore infrastructure, and for the future additional network requirements. Subsequent NOAs should not reconsider the onshore works recommended in the HND and should either include or refer to the HND as NOA's recommendation on these onshore upgrades, allowing TOs to continue to press ahead with the development of these vitally important schemes. Details of the NOA6 schemes given a 'proceed' signal by the ESO in January 2021, which we propose should form the 'baseline' are listed in the accompanying Annex A.

The HND should directly contribute to the formation of the needs case used to justify the need for investment to Ofgem

Within the TOs' current regulatory funding framework, and more specifically, Ofgem's LOTI process, a decision on whether a project is 'needed' on the network is only made at the Final Needs Case (FNC) stage. This is too late in the planning and procurement processes to offer TOs' certainty to proceed in these key areas, particularly in light of the timelines to 2030. Ofgem give a view on the need for a project at the Initial Needs Case (INC) stage of the process, which is helpful ahead of significant activities, including statutory consultation. As the OTNR Terms of Reference for the CDG, states that the HND should also consider environmental and other considerations, alongside cost, such rigorous assessment of the HND allows for the HND to justify the existence of the network 'need' at a much earlier stage in the process. The existence of the HND, should therefore accelerate the INC stage of the LOTI process significantly, allowing for the expedited investment decisions from Ofgem, to facilitate accelerated network development. We have raised this proposal with Ofgem and look forward to further discussions with Ofgem on how the HND can facilitate a 'light touch' INC assessment. We also believe Ofgem's Net Zero re-opener could be another potential avenue to accelerate the regulatory process.

[20] NOA6 - https://www.nationalgrideso.com/document/185881/download

The HND should directly contribute to the formation of the needs case used to justify the need for investment to planning authorities and must be endorsed by Government National Policy Statements and National Planning Frameworks to provide direction for the consenting processes

In order to support TOs in progressing schemes through consenting processes, development of the HND must include a sufficiently robust assessment of the onshore works (e.g. environmental impact) to enable endorsement within the National Policy Statements (NPS) and National Planning Framework (NPF). Timely regulatory endorsement and funding certainty on planning scope (e.g. before planning consultations commence, or through a Net Zero re-opener) will ensure certainty over consenting and prevents adversely impacting the deliverability of schemes in line with the Government's 40GW offshore wind targets.

The HND should also be used to inform the needs case for onshore infrastructure requirements. Agreed and early clarity on the network need across regulatory mechanisms should accelerate the securing of pre-construction funding, which must be in place to ensure planning and consenting certainty can be achieved by 2025 and accelerate Ofgem's LOTI process for construction funding for the recommended investments. Planning and regulation needs to be aligned, both in process and decision making, to provide confidence and certainty of joint outcomes. This should consider the holistic requirements for interacting regional project clusters, taking account of cumulative impact and agreed principals for design mitigations and planning scope.

It is important that the relationship between Ofgem's LOTI process and the necessary planning processes (e.g. the Development Consent Order (DCO) process in England and Wales, and equivalent planning processes in Scotland) are aligned and cross-reference the outputs of the HND at the Initial Needs Case Stage.

Looking to the future, a more strategic approach to planning energy infrastructure is required. In Scotland, this approach is happening organically through the formation of the Major Energy Projects Group, the ScotWind Roundtable and strategic planning from Marine Scotland's sectoral plan (which then informed Crown Estate Scotland's ScotWind leasing sites). The ScotWind Roundtable has brought these elements together for the purpose of delivering ScotWind by 2030 and proposed the Central Design Group. This is a similar approach to the Electricity Networks Strategy Group (ENSG) which met to address the long-term challenges to connect renewable generation. To achieve Net Zero, we believe policy makers and networks companies must work together to create greater certainty on long term strategic planning.

We would be happy to discuss the points raised in this response in greater detail.

Yours sincerely

Graeme Cooper	Aileen McLeod	Eric Leavy
Head of Future Markets	**Director of Business Planning and Commercial**	**Head of Transmission**
National Grid Electricity Transmission	**SSEN Transmission**	**SP Transmission**

Annex A

Onshore Infrastructure Projects which directly contribute to the delivery of the Government's offshore wind target of 40GW by 2030

There are 23 schemes which directly contribute to the delivery of the Offshore Wind target of 40GW by 2030. These have been recommended to 'proceed' by the ESO through the NOA process and can be addressed through different technical solutions which are currently being developed by SHET, SPT and NGET.

To remain consistent with the NOA6 publication (Jan 2021) these are listed in sequence of Earliest In-Service Dates, in brackets [20xx]. NOA6 schemes for which additional options are being considered to specifically address the Government's 40GW offshore wind targets will need to be included as recommendations within the HND.

- 1. East Coast Onshore 275kV Upgrade (ECU2) - [2023]
- 2. East Coast Onshore 400kV Upgrade (ECUP) - [2026]
- 3. Eccles Hybrid Synchronous Compensation (ECVC) - [2026]
- 4. Denny – Clydes Mill – Wishaw 400kV Reinforcement (DWUP) and Kincardine North 400kV Substation – [2026]
- 5. Yorkshire GREEN, Osbaldwick-Poppleton (OPN2) - [2027]
- 6. Eastern Link 1, Torness-Hawthorn Pit (E2DC) – [2027]
- 7. Eastern Link 2, Peterhead-Drax (E4D3) – [2029]
- 8. Denny – Wishaw 400kV Reinforcement (DWNO) – [2028]
- 9. Bramford-Twinstead Reinforcement (BTNO) - [2028/29]
- 10. SEA Link, Suffolk-Kent (SCD1) – [2029]
- 11. Beauly to Loch Buidhe 275kV reinforcement (BLN2) – [2030]
- 12. Beauly to Blackhillock 400kV double circuit addition (BBNC) – [2030]
- 13. North East Anglia (AENC) – [2030]
- 14. South East Anglia (ATNC) – [2030]
- 15. Tilbury Grain New Circuit (TENC) – [2030]
- 16. New 400kV double circuit between Blackhillock and Peterhead (BPNC) – [2031]
- 17. North to South Humber Reinforcement (CGNC) – [2031]
- 18. South Humber to South Lincolnshire Reinforcement (GWNC) – [2031]
- 19. Eastern Link 3, Peterhead to South Humber (E4L5) – [2031]
- 20. Eastern Link 4 (TGDC) – [2031]
- 21. New Circuit from South Scotland to Harker (CMNC) - [2031]
- 22. New Double Circuit from South Lincolnshire to Rutland (LRNC) – [2031]
- 23. Uprate Brinsworth – Chesterfield, and New Circuit from Ratcliffe to Chesterfield (EDNC) – [2033]

The above list excludes wider network upratings and reinforcement works (e.g., shorter-term schemes in the 1-7 years horizon) which are also required to ensure wider network preparedness for 2030 but are not directly linked to Offshore Wind developments.

Projects [16] and above have EISDs post-2030 but enable capacity for the UK to achieve, and in some cases exceed 40GW; it is necessary to consider these circuits as sufficiently grouped to the delivery of projects [1]-[15] to fully enable the delivery of the offshore wind capacity and hence, the Government's 2030 offshore wind targets.

These schemes are based on the FES2020 scenarios considered by NOA6. The generation backgrounds considered by HND may lead to requirements for additional schemes; e.g. additional Irish Sea generation may require developments in Wales / along the West Coast.

Annex: Scotwind roundtable response to Ofgem OTNR consultation

ScotWind roundtable response to Ofgem's OTNR consultation

Introduction

The ScotWind roundtable was established in early 2021, bringing together key stakeholders with a shared ambition to: '*identify tangible and deliverable solutions to the grid barriers to ScotWind development that ensure long-term benefit to consumers, the environment, local communities and other legitimate users of the sea*'.

As a roundtable, we strongly support the intention of the Offshore Transmission Network Review (OTNR) and the need for greater coordination and collaboration, accelerating the investment in electricity transmission infrastructure required to meet our 2030 offshore wind targets and deliver a pathway to net zero emissions.

This response sets out several key themes and recommendations that we collectively believe Ofgem and BEIS should consider as part of the development of the Pathway to 2030 (PT2030) workstream of the OTNR.

Coordination is needed, onshore and offshore

Enabling up to 10GW of new offshore wind in Scotland by 2030 will require significant network infrastructure development, both onshore and offshore. Through the Scottish Government's Sectoral Plan for Offshore Wind, we already have a strategic plan with potential locations for ScotWind generation and through the NGESO's Networks Option Assessment (NOA) 6, substantial work has already been done to identify strategic reinforcements in onshore transmission infrastructure and associated boundary transfer 'boot straps' that we continue to expect will be required to support the connection and transportation of ScotWind generation to demand centres in the south.

The Holistic Network Design (HND) for PT2030 approach, as set out in the Terms of Reference, commits to using existing industry processes (with amendments where necessary) to produce timely recommendations for 2030 targets. Therefore, the HND for 2030 should build upon existing work undertaken through network option appraisals and existing sectoral planning, particularly in instances where the HND is seeking to bring new wind generation onshore.

Delivery models must align with 2030 targets

Given the extremely challenging timescales associated with delivering 2030 offshore wind targets and the associated network infrastructure, when determining the preferred delivery model for the offshore transmission infrastructure, it is critical that this can both realise energisation for 2030 and give certainty to offshore developers.

Whilst the roundtable is not providing a view on which of these offshore delivery models should prevail, we would strongly encourage Ofgem to ensure its assessment is clearly underpinned and assessed against the achievement of national 2030 offshore wind targets. This may result in different offshore delivery models for the Pathway to 2030 and the subsequent Enduring Regime, allowing for the regulatory and legislative changes that will be necessary for several of the offshore delivery models proposed for the Pathway to 2030.

Equally, the development and delivery of the associated onshore transmission infrastructure required to enable delivery of 2030 targets must also be viewed in terms of deliverability by 2030. The development of onshore network infrastructure has long lead times (similar to those of offshore wind farms) and the Pathway to 2030 workstream programme must accommodate early decision making by TOs to ensure that the necessary onshore transmission

infrastructure is in place to support the 2030 targets. This will result in greater certainty to offshore wind developers and the supply chain.

Scottish policy needs to be reflected

The ScotWind leasing round could deliver up to 10GW of new offshore wind capacity, supporting the Scottish Government's 11GW 2030 target and making a significant contribution to the UK Government's 40GW 2030 target.

Planning policy and consenting, including elements of environmental policy and seabed leasing (undertaken by Crown Estate Scotland) are all devolved powers. It is crucial that the Pathway to 2030 recognises and reflects where the timing and/or approach of these processes differ in Scotland given the critical role ScotWind will play in meeting 2030 targets.

For example, there will be a requirement to quickly reassess the HND outcome almost immediately following its anticipated delivery in January 2022 when the outcome of the ScotWind leasing round is known – both the HND outcome and the target date for confirmation of successful ScotWind projects is January 2022. Such a review will be essential for successful ScotWind applicants seeking confidence in the transmission infrastructure programme necessary for their connections.

The HND needs to provide a high degree of certainty

Notwithstanding the need to reassess the HND following the outcome of the ScotWind leasing round, the HND must provide a clear recommendation that gives confidence to offshore wind developers, the supply chain, communities and environmental stakeholders about the high-level network infrastructure required to deliver 2030 targets.

This will allow meaningful consultation and engagement to take place with those affected stakeholders and ensure a collaborative approach to developing the subsequent Detailed Network Design (DND). It will also help secure the supply chain and associated skills development required to deliver 2030 targets in what is already a highly competitive and constrained global supply chain, encouraging inward investment and associated economic opportunities this would present.

Whilst we fully recognise and support the need for regulatory and consenting decisions to follow the robust processes already established, equally, we believe Governments and Ofgem must take bold decisions to provide the necessary confidence to deliver against our 2030 targets.

Strategic planning and a formal role for the roundtable

The OTNR and associated Pathway to 2030 workstream presents a unique opportunity to take a strategic approach to accelerate the development of the network investments required to enable 2030 targets. To achieve this, close collaboration and coordination is essential.

In Scotland, this approach is happening organically through the formation of the Scottish Government's Major Energy Projects Group, the ScotWind Roundtable and strategic planning from Marine Scotland's Sectoral Plan, which informed Crown Estate Scotland's ScotWind leasing sites.

The ScotWind Roundtable has brought these elements together for the purpose of delivering ScotWind by 2030 and we believe policy makers and networks companies must work together to create greater certainty on long term strategic planning.

As a roundtable - with the collective knowledge, skills and track record to drive forward necessary actions to achieve coordinated spatial and electrical system planning - we stand ready to support BEIS and Ofgem in any way we can. As part of this, we believe the roundtable should have a role in informing and assessing the draft HND from a Scottish perspective, ensuring Scotland's policy targets and devolved powers are reflected in the final HND development.

Conclusion

We welcome the opportunity to respond to Ofgem's consultation and as a roundtable, look forward to continued constructive engagement as we seek to deliver against our shared ambition. We hope our representation will be carefully considered as part of the development of the Pathway to 2030.