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

### Response from The Crown Estate

September 2021

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#### Introduction

The Crown Estate is an independent commercial business created by an Act of Parliament to manage a diverse portfolio that includes the seabed around England, Wales and Northern Ireland. In this capacity we work closely with industry and stakeholders to enable the sustainable development of the seabed, including by providing seabed rights for offshore renewable energy, as well as marine aggregates and minerals, cables and pipelines, and carbon capture and storage.

Beyond leasing, we play an active role in developing and helping to sustain the UK offshore wind sector as a whole, working together with industry, government, regulators and our many stakeholders to unlock the potential of our world-class seabed resources, while balancing the wide range of interests in the marine environment. We do this by taking a long-term view, working to identify and address common challenges, bring industry together, and encourage information sharing. All of which has helped to attract investment, bring down costs, unlock value, and support the UK's decarbonisation targets.

We welcome this initial consultation on changes intended to bring about greater coordination in the development of offshore networks, and support the work of Ofgem and BEIS in pursuing this important policy shift. The benefits case for delivering a more coordinated approach to connecting offshore wind (in terms of costs, environment and society) were well made in National Grid ESO's Phase 1 report from their Offshore Coordination project<sup>1</sup>. These findings chime with our own views on the need for reform, and therefore we support the Offshore Transmission Network Review (OTNR), and have welcomed the opportunity to directly input into the review through our role as a Project Partner. This has included us leading the development of the 2030 Generation Map and commissioning of the East Coast Grid Spatial Study<sup>2</sup>, which identifies the importance of the broader spatial context for the connection of offshore wind capacity.

We will continue our active engagement in this essential area as the policy landscape becomes clearer over the coming months, bringing to bear our unique perspective and insights. We believe now is the time to do things differently given the scale of the Net Zero challenge and believe the Offshore Transmission Network Review is an important example of putting this need into practice.

#### Evolution of The Crown Estate

Given this consultation is seeking to drive change in the way offshore wind is connected to the system, we are taking the opportunity to set out how The Crown Estate is evolving its approach to the marine environment as part of the UK's drive toward delivering Net Zero emissions by 2050.

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<sup>1</sup> <https://www.nationalgrideso.com/future-energy/projects/offshore-coordination-project>

<sup>2</sup> <https://www.thecrownestate.co.uk/media/3801/east-coast-grid-spatial-study-summary-report.pdf>

For the past 260 years, TCE has managed a large and diverse portfolio of real estate assets. During that time, we have changed the way we have managed our portfolio to adapt to the social and economic needs of the day to maximise the value we create for the country. As we look to repair our economy and society from the fallout from Covid-19 and face up to long-term challenges like climate change and the rise of technology, we need to adapt again. However, we know that to do this well we must change how we do business to focus on addressing national and global challenges.

We have identified three core strategic challenges facing the marine environment:

- **A need for greater spatial coordination:** Achieving 2050 targets will require technologies and other marine uses to effectively co-locate. From our analysis we know that a significant proportion of the total offshore wind key resource area is already utilised or overlaps with existing seabed use or environmental designations, so more efficient use of the seabed is needed to meet rapidly growing demand on a congested space. Furthermore, the environmental impacts of technology deployment is also a significant and growing constraint to further development.
- **A need for a quicker and more consistent route to market:** The future of offshore wind is not just about offshore wind – it is increasingly dependent upon resolving the future of other emergent technologies, infrastructure, and environmental issues. However, responsibilities for strategic decision-making and resolving competing interests are not completely clear.
- **A need to unlock significant private investment:** The Climate Change Committee estimates that ~£20bn p.a. investment is required in the power sector to deliver net zero by 2050. This investment will drive down technology costs, unlock supply chains and alleviate environmental constraints. Clarity around policy and regulatory frameworks will be necessary to maintain investment in more mature technologies whilst stimulating investment in nascent technologies (such as hydrogen). Furthermore, in many areas costs are difficult for individual parties to bear, such as regarding ports and compensatory habitats.

Many of these issues are widely known and they will require a range of actors (Government, regulators, statutory bodies and the private sector) to work together to deliver the right outcomes. The Crown Estate is planning to take three distinct actions to address these strategic challenges:

1. **Re-thinking our approach to leasing:** We recognise that our approach to the way in which the seabed is leased will need to change in order to support delivery against the UK's Net Zero emission targets, as well as to optimise use of a constrained seabed space and encourage co-location of technologies where feasible. Specifically we will be driving toward an agile and repeatable leasing process that is integrated across seabed uses. We will also explore front-loading activity to accelerate development, such as investing in pre-consenting works and surveys. As part of this, we will align our leasing approach to support delivery of outcomes from the OTNR.
2. **Building a data and evidence capability:** We will continue to invest in our data and evidence capability to de-risk consenting and accelerate development, building on the spatial analysis we already do as part of our leasing rounds and also our Offshore Wind Evidence and Change (OWEC) programme<sup>3</sup>. This enhanced capability will enable us to utilise spatial and evidentiary inputs to improve strategic decision-making and inform trade-offs between seabed uses. It will also support the development of a coordinated offshore grid through improved data and evidence available to Government, the ESO and developers among others.

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<sup>3</sup> <https://www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/offshore-wind-evidence-and-change-programme/>

**3. Investing to accelerate development:** We are considering how we best put our own capital at work to remove market barriers and unblock supply chain constraints. This could include enabling investments into data and evidence as per outlined above, and also investments in infrastructure, such as the potential for anticipatory investment into grid – albeit discrete opportunities would need specific analysis and a business case.

Through these actions, we will drive infrastructure development to 2050 while creating a better balance for competing demands on the seabed. At the same time, this will seek to unlock opportunities to create greater economic, environmental and social value and jobs from the marine environment whilst enhancing biodiversity.

### Overview comments

It is clear offshore wind will play a major role in delivering against the UK's Net Zero emissions targets, and the 40GW target by 2030 will be a significant step toward decarbonising our power system. At present there is over 10GW of operational capacity in UK waters, with a pipeline of in excess of 60GW (inclusive of the potential for 10GW from Crown Estate Scotland's Scotwind process). This pipeline includes the six 'preferred projects' that were successful in the Round 4 tender process, which concluded in February 2021<sup>4</sup> (the award of rights for these projects being subject to the Round 4 Habitats Regulations Assessment). Furthermore, in March 2021, we announced that work was commencing on the design of a new leasing opportunity for early commercial-scale floating wind in the Celtic Sea region<sup>5</sup>, which will be an important step towards delivering on the Government's ambition for 1GW of floating wind by 2030.

What is also clear however is that the way electricity is transferred from offshore wind to end users needs to change from one that delivers solely radial connections. The current regulatory regime has provided a stable basis for investment over the last decade and has delivered against its original policy objectives, which were principally focussed on reducing costs. There are well documented recent challenges for offshore wind and associated onshore grid infrastructure on the east coast of England. With an expectation that 100GW or more may be needed by 2050, as recommended by the Committee on Climate Change in its 6<sup>th</sup> Carbon Budget<sup>6</sup>, more significant challenges may arise in other areas in the future unless we consider reforms to better manage the wider social, environmental and economic impacts of major infrastructure developments. This current review is a timely opportunity to re-focus the approach to enabling and incentivising solutions which works for all stakeholders.

However, within the current arrangements, there are good examples of where developers have sought to optimise connections and seek integrated solutions where possible on the offshore transmission works. This includes infrastructure sized at or around 1.8 GW with investment in anticipation of future projects. It is important that in driving for change, projects that are currently in development are not adversely impacted unnecessarily, in turn risking the successful delivery of capacity that is needed to secure the Government's target of 40GW by 2030.

We offer the following points and recommendations in response to some of the key issues raised in the consultation:

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<sup>4</sup> <https://www.thecrownestate.co.uk/en-gb/media-and-insights/news/2021-offshore-wind-leasing-round-4-signals-major-vote-of-confidence-in-the-uk-s-green-economy/>

<sup>5</sup> <https://www.thecrownestate.co.uk/en-gb/media-and-insights/news/the-crown-estate-to-create-new-floating-wind-leasing-opportunity-in-the-celtic-sea/>

<sup>6</sup> <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

- On the Early Opportunities workstream:
  - (i) We agree that reform of the existing arrangements is necessary in the shorter as well as longer terms and welcome in particular consideration in the consultation around how cost recovery mechanisms could be adapted to cater for anticipatory investment. However, proposed concepts and regulatory reforms presented could cause a slowdown in development, particularly for those projects that are at an advanced stage, presenting delay risk to individual project programmes, deployment hiatus and additional pressure on the offshore wind industry delivering the 40GW target by 2030.
  - (ii) We understand that the concepts as presented are optional for developers to pursue, but there will be an expectation for developers to evaluate more coordinated alternatives to current designs. To support the reform process and consideration of alternatives, we welcome recognition in the consultation of the potential changes that may be needed to licences, codes and other industry arrangements to deliver the proposed new arrangements. Based on prior major industry reform programmes, it is likely that the necessary changes will potentially take significant time to develop and implement; however developers will need to understand these changes in detail and their implications in order to consider alternative their projects and take investment decisions.
  - (iii) In light of the above, we recommend more focussed and detailed engagement with projects and their associated delivery programmes, potentially with Ofgem and/or the ESO evaluating impacts at a project level against a range of metrics in addition to cost, for example on programme impacts and supply chain considerations. It will be important that viable alternative pathways exist for projects, and that current plans are not discounted without understanding the specific benefits (including economic, environmental and societal) that might be gained by continuing to pursue them. It will be key that appropriate regulatory and policy protections and flexibilities are explored to ensure unnecessary delay risk is minimised, or the trade-offs of change are deliberately considered.
- On the Pathway to 2030 workstream:
  - (i) It will be important that robust assumptions are adopted for floating offshore wind in the Celtic Seas region and that the Central Design Team factors these into work on the Holistic Network Design. Our intentions on a new leasing opportunity in this region confirms the relevant of this, itself underpinned by the clear role floating wind will play in the future of the sector, and in the light of the Government's near term ambitions for floating wind by 2030.
  - (ii) We recommend that assumptions on the asset life of offshore transmission infrastructure are reviewed as part of the work of the Central Design Group – and specifically to take into account that leases granted under Round 4 will have a 60-year term. Offshore wind farms are typically designed for an expected life of 25-30 years and our understanding is that the associated offshore transmission infrastructure has to date typically been designed for a similar life. However, given the expected role that offshore wind will play in delivering our Net Zero targets it is conceivable that the associated offshore transmission infrastructure could in the future be developed for a longer operational life than at present to cater for re-powering and/or re-planting at the same site. We commissioned a study on this issue in 2019<sup>7</sup> and this identified a range of upsides from designing infrastructure for a longer life, including in respect

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<sup>7</sup> <https://www.marinedataexchange.co.uk/details/2111/2020-itp-energised-and-ramboll-longer-offshore-transmission-design-life>

of overall costs to consumers and the environment. We elaborate further on this report in response to the detailed questions in the consultation, and would be happy to discuss further.

- Finally, the marine environment is vital for the UK's prosperity and supports a wide range of nationally important sectors including fishing, tourism and shipping, leisure, energy and digital infrastructure. It will therefore be important to factor in explicitly the broader environment when considering grid planning for the connection of future offshore wind. We therefore welcome the holistic network design approach proposed for the 'Pathway to 2030' and recognition within it of the importance of the spatial context of development. However, we would recommend that in undertaking its work on this holistic design, the ESO consults with a wide spectrum of stakeholders to ensure a richer consideration of the impacts and implications of development in the offshore environment.

Appendix 1 includes more detailed answers to those questions posed in the consultation where we consider we can make a value-adding contribution.

We trust that you will find our comments on the consultation constructive and we would be very willing to provide additional information on any of the points we have raised above and be very pleased to discuss these matters with you further.

All of this response may be put into the public domain and there is no part of it that should be treated as confidential.

Yours Sincerely,

A handwritten signature in black ink, appearing to be "Richard Clay", written in a cursive style.

Richard Clay,

**Senior Manager, Energy Policy & Regulation**

## Appendix 1: Responses to questions posed in the consultation

### **Q1: Are there any concepts we have not identified developers (as defined in this chapter) may wish to progress?**

The Crown Estate notes the options presented appear comprehensive and given we understand that these have been presented by developers, we do not have views on possible alternative concepts at this time. We want to make two additional observations however:

- (i) We have existing structures that support separate and devisable arrangements for wind farms and their associated transmission infrastructure (i.e. Agreements for Lease for wind farm array areas and Agreements for Lease for the Transmission Assets). Many of the projects that will likely fall within the Early Opportunities workstream already have Agreements for Lease in place for their proposed cable routes, some of which have been in place for some time, with associated milestones and development plans. Any changes to connection configurations for these projects will likely necessitate amendments to these agreements, which will take time to process and introduces a degree of additional uncertainty. We will work with developers to process these as and when necessary in accordance with our established procedures.
- (ii) Outside of 12 nautical miles, The Crown Estate has the rights to lease cables and related infrastructure for the transmission, distribution and supply of energy generated from renewable sources (water or winds). However, management of other electricity transmission assets outside 12 nautical miles is not currently regulated in this way (following the provisions of the United Nations Convention on the Law of the Sea (UNCLOS)). Whilst there may be limited scope to deviate from the current approach, we suggest that BEIS and Ofgem may wish to consider what approach can be taken to ensure appropriate leasing controls for some of the concepts presented in the consultation, such as the multi-purpose interconnector concepts.

### **Q4: What options are available to developers in demonstrating a reasonable expectation they intend to connect to the system?**

The consultation notes in section 2.3 that the objective of the Early Opportunities workstream is to facilitate greater coordination in the connection of offshore wind projects which are at a relatively advanced stage of the development process. In the light of this, and given the multiple millions that developers will have expended thus far on design, planning and development activity – including in terms of User Commitment securities – there should already be a strong degree of confidence that these projects have a reasonable expectation of connecting to the system (subject to achieving the necessary consents).

Looking beyond the Early Opportunities workstream, we would suggest that developers entering into an Agreement for Lease with The Crown Estate signifies considerable intent to connect to the system.

### **Q7: Do you agree with Ofgem's proposed approach to deliver the objectives of Early Opportunities workstream?**

We note that practical implementation of the proposed arrangements will require a range of changes to the regulatory framework, including in terms of codes, licences and guidance. Whilst we do not have specific comment on the extent of changes at this stage, we echo here our earlier comment that it will be essential that implementation does not introduce delay to projects and/or introduce unnecessary risks – and that appropriate protections are put in place for projects in development.

**Q8: 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**

The current developer-led approach to the development of offshore transmission infrastructure has led to a proliferation of radial links, each of which is subject to a cost assessment exercise in accordance with the prevailing regulatory framework. As such, by definition, each radial link should be economic and efficient. Whilst it is not possible to ascertain whether the sum total of the infrastructure deployed to date is economic and efficient as a whole, the findings from National Grid ESO's Phase 1 report suggest that this approach is not efficient when viewed collectively, given the counterfactual of a coordinated approach delivers significant cost savings.

We broadly agree therefore that taking a more holistic design approach in the Pathway to 2030 workstream should lead to more a coordinated and efficient system. However, this will be dependent on detailed implementation. We look forward to understanding the next level of detail on delivery models as the policy matures.

We offer three further comments on the holistic network design:

- (i) It will be important that robust assumptions are adopted for floating offshore wind in the Celtic Seas region and that the Central Design Team factors these into work on the Holistic Network Design. Our intentions on a new leasing opportunity in this region should provide the necessary confidence that capacity will emerge in due course and in the light of the Government's ambitions for floating wind by 2030.
- (ii) We note from the draft Terms of Reference for the Central Design Group includes details on membership, and this includes the ESO, NGET, SSEN-T and SPT. We agree that this core membership is appropriate given the remit of the forum. Whilst we understand that these draft Terms of Reference are not in scope of the consultation, given the role The Crown Estate plays in the allocation of seabed rights in England, Wales and Northern Ireland, we would expect that the Central Design Group would have a duty to consult with and/or seek input from us as it progresses its work. We would welcome clarity on this issue through the finalisation of the Terms of Reference.
- (iii) Whilst the holistic approach should lead to a more economic and efficient system overall compared to a radial approach, there will be an increase in infrastructure requirements as we deploy more offshore wind in support of our Net Zero targets. It will be important therefore to ensure broader environmental (including biodiversity) and societal contexts of this infrastructure are factored into the design and delivery options. We welcome recognition of this in the consultation, and look forward to working with key stakeholders to support the approach as it develops over the coming months.

*Potential further opportunity for value creation*

Offshore wind farms are typically designed for an expected life of 25-30 years and our understanding is that the associated offshore transmission infrastructure is typically designed for a similar life. However, given the expected role that offshore wind will play in delivering our Net Zero targets it is conceivable that the associated offshore transmission infrastructure could in the future be developed for a longer operational life than at present to cater for re-powering and/or re-planting at the same site.



We commissioned analysis in mid-2019 looking at the economic and technical case for pursuing a strategy of longer assets lives for offshore transmission infrastructure. Specifically, the analysis considered the feasibility of designing infrastructure that would last for up to 60 years to cater for two windfarm life cycles at the same location, which would help enable any subsequent re-powering and/or re-planting of the offshore windfarm once the original windfarm has come to the end of its life. ITP Energised (supported by Ramboll) undertook the technical and economic analysis; CmY Consultants led the stakeholder engagement for this initiative on our behalf. In outline, this work concluded that:

- The life-cycle costs of a radial offshore transmission system designed for 60 years at the outset are up to 27% less than the cost of designing and operating two offshore transmission systems to support an initial and then subsequent windfarm in the same location. These cost savings take into account a refurbishment campaign on the offshore transmission infrastructure at the end of the initial windfarm's life at year 30.
- This life-cycle cost saving could reduce the Levelised Cost of Energy of the connected offshore windfarm by 1%,
- Modelling of the NPV of the associated OFTO Tender Revenue Stream for longer life infrastructure demonstrated that this was lower in all scenarios considered in the analysis than the status quo, thus demonstrating direct consumer benefit.
- There are significant environmental, CO2 reduction, waste reduction, and health and safety benefits (such as reduced offshore working time) resulting from the 60-year scenario. The analysis did not monetise these benefits however, but the report recommended further work in this area.
- Designing the structural and electrical components of offshore transmission for a longer life is largely technically feasible today, although some risks remain particularly regarding the operational life of polymeric insulated (XLPE) export cables which do not have a track record beyond 30-35 years, which suggests further research is required in this area.

This analysis was undertaken on the basis of radial links, as this was the prevailing model at the time of the work's inception, and we recognise work would be needed to develop an appropriate coordinated design counterfactual. However, arguably the conclusions would seem more relevant when considering more coordinated designs given the offshore transmission assets would be used by more than one offshore wind farm, each of which will presumably be developed in different time horizons.

We socialised the outputs of this work with a range of stakeholders in early 2020<sup>8</sup> and there was general support for exploring further longer design lives. With the work now planned for a holistic design, we consider the time is right to further this thinking within the context work planned for the Central Design Group.

**Q11: 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.**

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<sup>8</sup> Engagement on this issue included with offshore wind developers, trade bodies, OFTOs, OEMs, financiers, and Government departments/agencies including Ofgem, BEIS, OGA and MMO.



We agree that the existing developer-led model should be retained for instances where a radial solution is the most appropriate connection design. The model broadly works and risks are generally allocated to those parties best placed to manage them. However, there are still some outstanding areas within the existing regime which could be improved, as were flagged in the OWIC report from 2019 on short term reforms<sup>9</sup>, for example with respect to O&M and asset health monitoring.

Our own survey of offshore wind and OFTO operators in 2020 highlighted some of these points and we flagged them in our response to Ofgem's consultation on the End of Tender Revenue Stream issued in March 2021. In particular, that certainty on TRS life extension policy is required early to influence long term asset health, as well as the need for greater clarity on condition monitoring and assessment of the transmission assets in later life. We would welcome Ofgem addressing these outstanding issues as part of its general improvements to this part of the regulatory framework and note it has released a decision document on 23 July 2021 and will be consulting further at the end of 2021.

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<sup>9</sup> <https://www.owic.org.uk/documents>