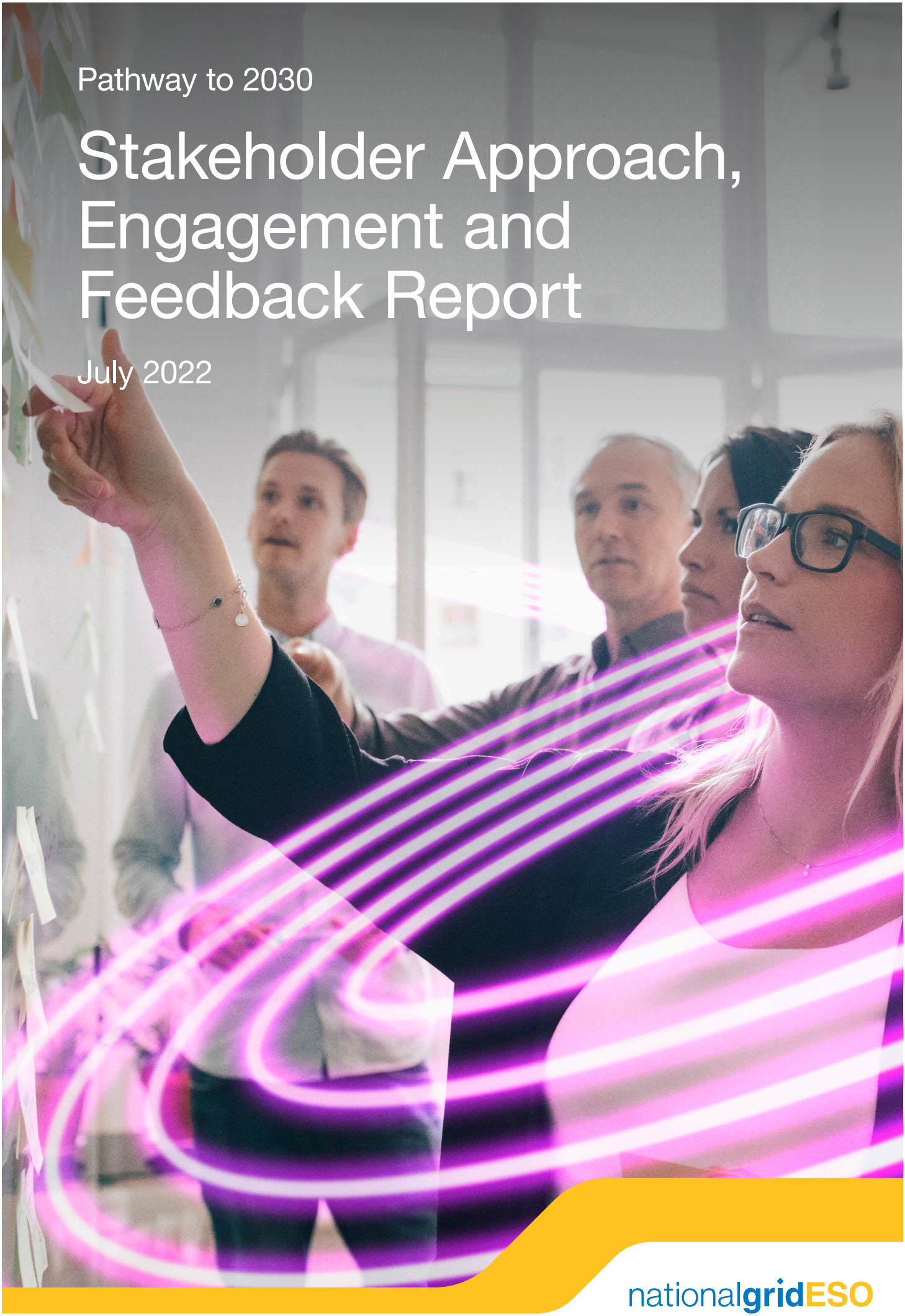
Pathway to 2030

# Stakeholder Approach, Engagement and Feedback Report

July 2022



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# Contents

# 1. Introduction

## Stakeholder engagement and feedback has been key in developing the Holistic Network Design

We have worked in collaboration with a wide range of stakeholders who have challenged, shaped and informed our proposals to help deliver the Holistic Network Design (HND). This report provides an overview of how we have sought the views of developers, environmental and community stakeholders, as far as appropriate and reasonably practicable, in developing the HND.

The Stakeholder Approach, Engagement and Feedback Report is one out of a suite of six detailed documents forming the Pathway to 2030 Publication Package[1]. This report seeks to deliver on the Department for Business, Energy, and Industrial Strategy (BEIS) and the Office of Gas and Electricity Markets (Ofgem) expectations set out within the agreed Terms of Reference (ToR), for the Electricity System Operator (ESO) to consider the views of developers, environmental and community stakeholders as far as appropriate and reasonably practicable in developing the HND:

> "The development of a coordinated onshore and offshore National Electricity Transmission System (NETS) impacts a wide range of stakeholders; therefore, stakeholder engagement is critical to the successful delivery of the HND. Stakeholder feedback will be recorded throughout the development of the HND and will feed into a separate report (Stakeholder Approach, Engagement and Feedback) that will be published with the HND. The stakeholder engagement approach aligns with the HND ToR, that specifies which stakeholders should be engaged throughout the design process"

*Extract from the HND Methodology[2]*

This report sets out:

- Our approach to HND stakeholder engagement.
- The engagement we carried out.
- How stakeholder views have been considered within the final HND.

## Background

In July 2020 the Energy Minster launched the Offshore Transmission Network Review (OTNR). The objective of the OTNR is "to ensure that the transmission connections for offshore wind generation are delivered in the most appropriate way, considering the increased ambition for offshore wind to achieve net zero. This is with a view to finding the appropriate balance between environmental, social and economic costs." The OTNR is led by BEIS with support from a range of UK Government and industry bodies. We and several other organisations are project partners. More information on the OTNR and the project partners can be found on BEIS's website[3].

In November 2020 the UK Government published its Ten Point Plan for a Green Industrial Revolution[4], which makes clear that offshore wind is a critical source of renewable energy for the UK's growing economy. In this plan the UK Government expressed its ambition to quadruple its offshore wind capacity by 2030 to 40 GW and achieve net zero greenhouse gas emissions by 2050. In the British Energy Security Strategy (BESS)[5], published April 2022, the UK Government increased its ambition for offshore wind to 50 GW by 2030. Alongside this the Scottish Government has an ambition for 11 GW offshore wind by 2030 and net zero greenhouse gas emissions by 2045.

To help realise these targets, a step change in both the speed and scale of deployment of offshore wind is required. The onshore and offshore transmission networks play a crucial role in making this happen. They need to change and grow in a way that is efficient for consumers and considers impacts on communities and

[1] https://www.nationalgrideso.com/future-energy/the-pathway-2030-holistic-network-design
[2] https://www.nationalgrideso.com/document/239466/download
[3] https://www.gov.uk/government/groups/offshore-transmission-network-review#terms-of-reference
[4] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf
[5] https://www.gov.uk/government/publications/british-energy-security-strategy

the environment. Since the beginning of the OTNR, we have been playing a key role in actively assessing whether there is a better approach to offshore networks. We are committed to delivering better outcomes for consumers and communities and supporting delivery of the UK Government's net zero ambitions.

## In December 2020 we concluded there is significant benefit to coordination

In December 2020 we published a report[6] on the costs and benefits of a more coordinated approach to connecting offshore wind and interconnectors compared to the current radial connection approach. With a radial approach, wind farms have individual connections to the main transmission network. These individual connections are designed independently from the onshore network, which transports electricity around the country. We confirmed there is significant benefit in moving quickly to an integrated network in which the onshore and offshore networks are coordinated to optimise the investment across the two and balance the design objectives. The analysis also suggested it is important to consider what flexibility there is for coordination between 2025 and 2030.

## The Holistic Network Design is delivered in consultation with the Central Design Group and governed by terms of reference

Following the December 2020 publication, BEIS and Ofgem requested that we deliver an HND, in consultation with the Central Design Group (CDG). This group was set up in 2021, to establish and support our development of the HND and to ensure stakeholder views were considered in the design. The purpose of the CDG is to act as a vehicle for us to consult and collaborate with Transmission Owners (TOs) on the HND, and to consult with stakeholder groups as the HND is developed.

The CDG is chaired by the ESO with the TO's and the ESO as members. BEIS, Ofgem and the Scottish and Welsh Governments are observers.

The specific roles for developing the HND by the ESO, CDG and the CDG subgroups are explained in the *HND Methodology*, which was published in February 2022, and the *HND Terms of Reference (ToR)*[7].

The ToR asks us to deliver an HND that considers the onshore and offshore network required to connect offshore wind. This is in order to connect offshore wind to facilitate the pace and certainty required to deliver the 2030 offshore wind ambitions, and the 2045 and 2050 net zero targets. The ToR requires the HND to be economic and efficient, deliverable, and operable, and minimise the impact on the environment and local communities.

[6] https://www.nationalgrideso.com/document/183031/download
[7] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1059676/otnr-central-design-group-network-design-tor.pdf

# 2. Holistic Network Design stakeholder engagement approach

We have taken a collaborative approach to our stakeholder engagement. Whilst we did not undertake a formal consultation, bespoke engagement, including a feedback window on draft recommended designs, has been carried out with a targeted group of stakeholders. There will be the opportunity for wider consultation as part of the consenting process when projects reach the Detailed Network Design (DND) phase and more specific locations are developed for the various elements of the network infrastructure.

When developing the offshore design and interface sites for the Holistic Network Design (HND), we assessed community constraint information and previous feedback provided by community stakeholders on the principles that should be followed when assessing interface sites for connection. This information is summarised in the HND document for the recommended design. Input from community stakeholders will be essential at the DND stage. We expect this to include engagement while plans are developed, as well as statutory consultation periods during the planning process.

The Offshore Transmission Network Review (OTNR) partners consist of: BEIS, The Crown Estate, Crown Estate Scotland, The Department for Environment, Food and Rural Affairs (Defra), The Scottish Government, The Marine Management Organisation, The Department for Levelling Up, Housing and Communities, Ofgem, The Welsh Government and the Electricity System Operator: The following summary shows some of collaboration during the development of the HND:

- Engagement with TOs: 86 ESO/TO meetings, 6 Commercial and 12 Stakeholder and Communication subgroup meetings.
- Offshore wind farm developers: 114 bilateral meetings, 2 Offshore Developer forums and 1 Offshore Developer Celtic Sea forum.
- CDG Environmental subgroup: 6 meetings and 5 workshops.
- OTNR Codes & Standards subgroup: 7 meetings and 6 workshops.
- Responses received on the draft design recommendations: 41 responses from offshore wind developers, environmental stakeholders, TOs and OTNR project partners.
- A variety of additional bilateral meetings with OTNR partners and environmental subgroup members were also held.
- A public progress webinar.

More detail on our engagement approach follows below.

## 2.1 Engagement through governance groups

The following sections provide an overview of the governance structure in place that we used to enable engagement with stakeholders when developing the HND.

### OTNR Governance

**The OTNR Project Board** is coordinated by a BEIS secretariat that oversees the OTNR, the groups within this include:

- **OTNR Working Group:** this group brings together OTNR project partners: The Crown Estate, Crown Estate Scotland, Defra, The Scottish Government, The Marine Management Organisation, The Department for Levelling Up, Housing and Communities, Ofgem, The Welsh Government, BEIS and the ESO. This group oversees all OTNR workstreams and were provided with a draft copy of the Pathway to 2030: HND summary document for comment and awareness ahead of publication.
- **Expert Advisory Group (EAG):** this group is chaired by the Offshore Wind Industry Council and consists of representatives from the offshore wind and interconnector developer community, onshore and offshore transmission owners, academia, independent technical experts, and environmental and consumer groups.

- **Expert Advisory Group Codes & Standards Subgroup:** the purpose of this subgroup is to provide transparency and visibility in the programme management of changes needed to codes and standards across the OTNR project.

Throughout the development of the HND we utilised the OTNR governance to engage with stakeholders as we met key milestones, made decisions, and used it to receive feedback throughout the process.

We, with the support of the CDG members as appropriate, will seek approval of the HND from the OTNR Project Board.

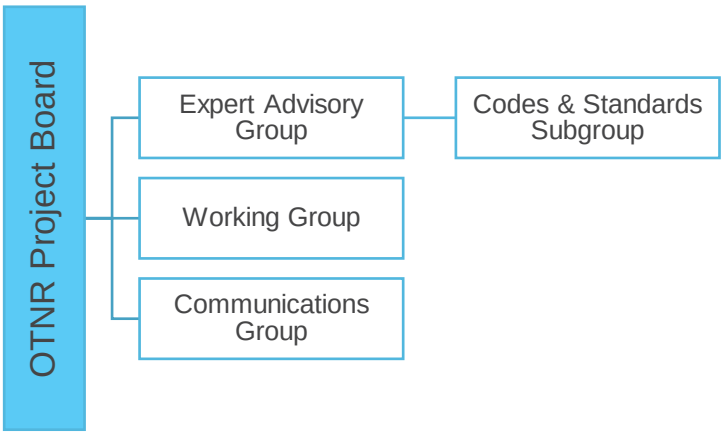


*Figure 1: OTNR Governance Structure*

## Central Design Group Governance

The delivery of the HND was underpinned by several groups established to facilitate us collaborating with stakeholders:

- **Central Design Group (CDG):** the purpose of the CDG was to act as a vehicle for us to consult with the onshore TOs and stakeholder groups as the HND was developed. The group met formally on a monthly basis. Ofgem, BEIS and members of the Devolved Administrations also attended, and other guests were invited on a case-by-case basis to provide input on specific topics.
- **Stakeholder and communications subgroup:** the purpose of this subgroup was to enable us to consult with the TOs on communication and engagement plans for the delivery of the HND, helping to ensure clarity and consistency for wider stakeholders.
- **Commercial subgroup:** the purpose of this subgroup was to ensure the *Industry Code, Standard and Licence Recommendation Report*[8] comprehensively considered and provided advice on the commercial impacts of and interactions with the HND output, for example codes and connections.
- **Environmental subgroup:** the purpose of this subgroup was to bring together key environmental stakeholders to provide advice to the CDG on the environmental impacts of the technically viable options being considered in developing the HND.
- **Developer forum:** The purpose of this group was to bring together all in scope developers (including all ScotWind leaseholders) to have collective discussions on the development of the HND.

The Terms of Reference (ToR) for the CDG specifically referenced offshore developers, environmental and community stakeholders as groups to engage. Through the CDG and its subgroups we have worked closely with the TOs and other key stakeholders to ensure information has been communicated clearly to those interested in, potentially impacted by, or helping to shape the HND.

[8] https://www.nationalgrideso.com/document/262691/download

| Subgroup | No. of meetings |
|---|---|
| CDG | 23 |
| CDG: Environmental Subgroup (ESG) | 6 |
| ESG Workshops | 5 |
| CDG: Stakeholder & Communications Subgroup | 12 |
| CDG: Commercial Subgroup | 10 |
| Codes & Standards Subgroup | 7 |
| Codes & Standards Workshops | 6 |
| Developer Forum | 2 |
| Weekly TO Meetings | 86 |
| Bi-lateral HND Developer Meetings | 114 |

*Table 1: Number of meetings grouped by engagement type*

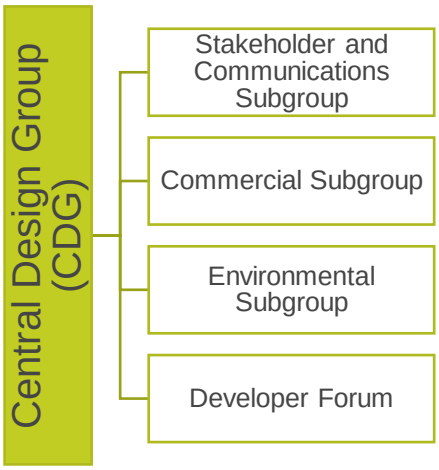


*Figure 2: Structure of the Central Design Group and Subgroups*

## 2.2 Other Engagement

In October 2021, we held a progress webinar[9] which gave an overview of the activities that the ESO has responsibility for in each Offshore Coordination workstream and defined the key steps for the delivery of the HND and the stakeholder groups involved.

We also held a webinar for developers, which went into more detail on the offshore unit costs, generation background, and approach to environmental and social constraints.

Along with the ESO-led webinars, we contributed to and presented at BEIS led webinars.

| Webinar | Attendees |
|---|---|
| Developer Webinar Oct 2021 | 156 |
| Autumn Progress Webinar Oct 2021 | 139 |

*Table 2: Number of attendees at each webinar*

In addition to the many forums, workshops and webinars held throughout the development of the HND, we held over 100 bilateral meetings with stakeholders in the Pathway to 2030 workstream. We recognised that stakeholders have unique concerns or had commercially sensitive data which could help inform the HND. Bilateral meetings provided a transparent platform for stakeholders to share these, while providing a foundation for a trusted partnership to be built with stakeholders. The relevant TO(s) attended our meetings with the developers to provide insight regarding onshore works and connection timescales.

[9] https://players.brightcove.net/867903724001/default_default/index.html?videoId=6281267670001

# 3. Feedback Opportunities

In addition to feedback opportunities provided in the Central Design Group (CDG) and subgroups, we sought feedback from stakeholders throughout the Holistic Network Design (HND) process. Our timeline below shows the formal engagement touch points in which stakeholders were provided the opportunity to provide feedback:


*Figure 3: Timeline of formal engagement touchpoints*

## 3.1 Cost Methodology

A crucial part of the HND is estimating the costs of offshore infrastructure as an input to our economic assessment tools. Industry developers were contacted to provide insights on different asset fixed and variable costs. This data was analysed to create costing parameters and a general costing model for offshore projects, including their onshore landing and connection assets. The cost methodology explained the costing parameters and capital expenditure (CAPEX) model along with the statistical models used to aggregate the data obtained from our stakeholder engagement as part of Phase 1, with the report and methodology published in December 2020.

In September 2021, we sought feedback on the *Offshore Costing Methodology* from the developers that were confirmed to be in scope for the HND at that time. The ScotWind leases had not been awarded at the time of defining the Cost Methodology, so it was not possible to consult ScotWind developers.

## 3.2 Environmental Constraints Feedback

The route corridor and siting options were appraised through a more detailed BRAG (Black, Red, Amber Green) assessment as part of the initial strategic appraisal defined in the HND Methodology. The appraisal focused principally on environmental and community impacts and technical considerations for the location and construction of required infrastructure. These were shared with the ESG, including the Transmission Owners (TOs), with the opportunity to provide written and verbal feedback in workshops held in March 2022.

## 3.3 Codes & Standards Feedback

In late November 2021, we held a series of stakeholder engagement workshops with the wider industry. The workshops focused on the Network Design Models (NDMs) seen within the Offshore Transmission Network Review (OTNR) Early Opportunities workstream[10], and possible variations of the NDMs anticipated to feature within the HND for Pathway to 2030. The objective of these workshops was to help inform and shape the recommendations for code and standard changes set out in the *Industry Code, Standard and Licence Recommendation Report*. These workshops were attended by representatives of Offshore Developers, Interconnectors, TOs and Ofgem. We hosted five engagement workshops in total, covering the following topics:

- Workshop 1 – Security and Quality of Supply Standard (SQSS) and Grid Code.
- Workshop 2 – Connection and Use of System Code (CUSC) Section 14.
- Workshop 3 – CUSC Section 15.
- Workshop 4 – CUSC (all remaining sections).
- Workshop 5 – System Operator - Transmission Owner Code (STC).

These stakeholder engagement workshops provided us with valuable feedback, including confirmation that we had correctly identified the areas of the codes and standards that would likely be most impacted by the conceptual NDMs within Early Opportunities, and potential variations of the NDMs that would likely appear within the HND for Pathway to 2030.

Following the feedback we have received from the industry workshops and the status of the individual opt-in proposals, we focused on charging code changes as they are likely to have the widest impact on industry. An OTNR charging workshop was held with the industry in May 2022 to obtain feedback on the challenges and the options for modifications.

## 3.4 Options Appraisal Summary Tables (OASTs)

In April 2022, we shared the draft Radial and Coordinated Options Appraisal Summary Tables (OASTs), which presented two radial and two coordinated options for each region and described how each option performed against the four design objectives. These documents set out a preferred radial and coordinated design for each region, and overall preferred design option. They were shared with all developers in scope of the HND in addition to all ScotWind leaseholders. They were also shared with OTNR stakeholders, the ESG and TOs. This was an important milestone and an opportunity for stakeholders to feedback on the draft recommended design. The OASTs were split into four regions:

- North West Region.
- South West Region.[11]
- East Coast Region.
- North Scotland Region.

[10] https://www.ofgem.gov.uk/sites/default/files/2021-07/OTNR%20Ofgem%20Consultation_Jul%202021_Final%20%281%29.pdf
[11] Based on three assumed wind farms with a total capacity of 1 GW, and is only an indicative design at this stage

Following the sharing of the OASTs, stakeholders were provided a two-week window in which they could provide formal written feedback. Stakeholders were asked to comment on the overall design and the four design objectives as set out by the Terms of Reference (ToR):

| Objective | Description |
|---|---|
| **Economic and efficient costs** | The network design should be economic and efficient |
| **Deliverability and operability** | The network design should be deliverable by 2030 and the resulting system should be safe, reliable and operable |
| **Environmental impact** | Environmental impacts should be avoided, minimised or mitigated by the network design, and best practice environmental management incorporated in the network design |
| **Local community impact** | Local community impacts should be avoided, minimised, or mitigated by the network design |

*Figure 4: Design objectives of the HND*

We met with developers around the time of the feedback window to answer any queries on the OASTs and give the opportunity for verbal feedback to be provided. We also held a further ESG drop in session in May 2022 to provide environmental stakeholders with the same opportunity.

We made changes to the design in response to feedback received and discussed the modified design with impacted developers. We also provided an update via the OAST appendix documents, which set out how the design had changed since the coordinated OASTs were shared.

# 4. Summary of feedback

## 4.1 Themes

Throughout the engagement opportunities there were key feedback themes. These themes along with our responses are summarised below.

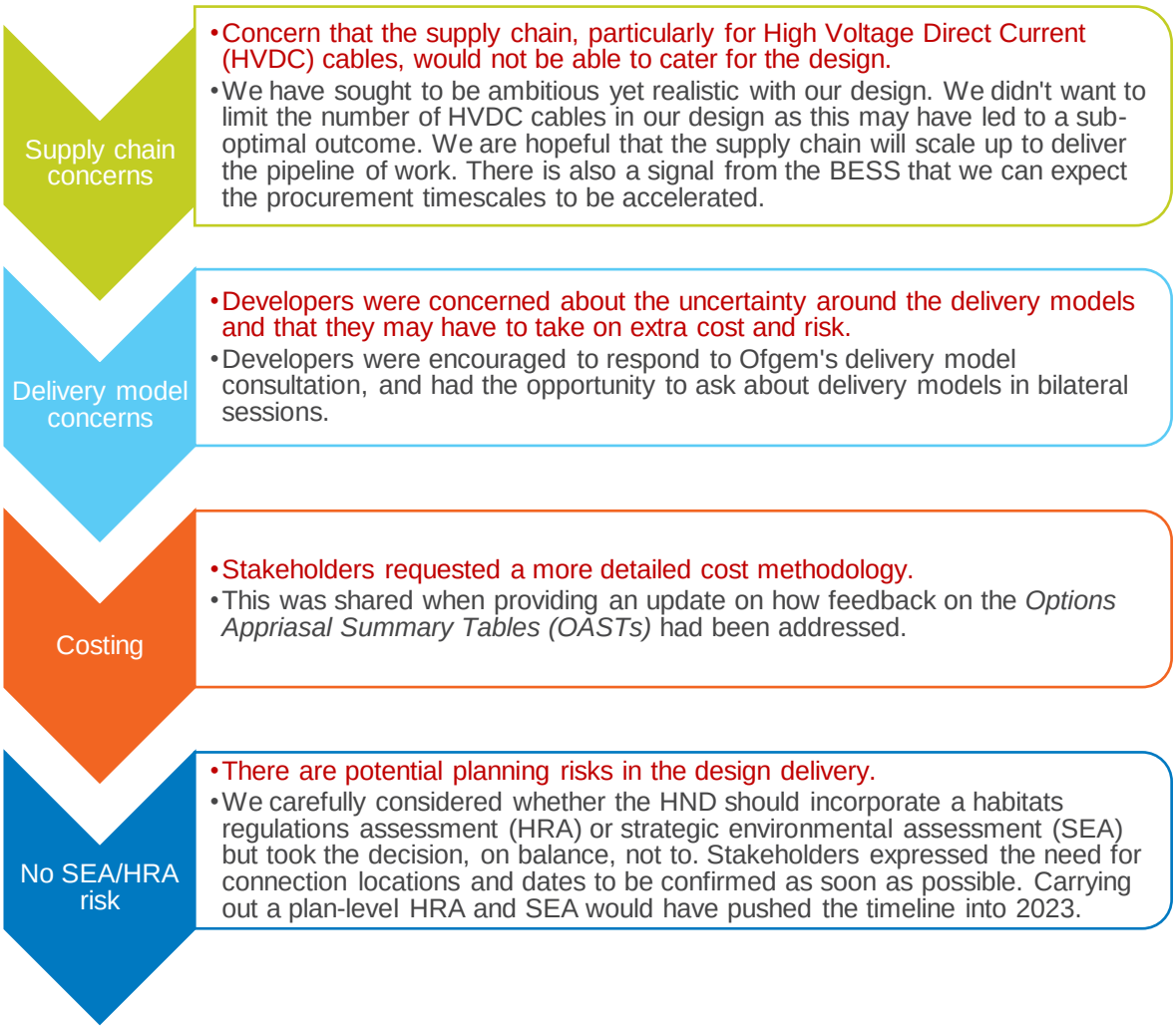


*Figure 5: Key themes from stakeholder feedback*

## 4.2 Cost Methodology Feedback

Due to the commercially sensitive nature of costings, feedback provided was treated as confidential. We answered queries and provided reasoning on the assumptions made to developers. Developers' feedback suggested the following should be included, which were considered and incorporated in the cost methodology and/or design:

- Midpoint compensation for alternating current (AC) cables.
- Redundancy analysis.
- Consenting.
- Deliverability.
- Updated minimum rating of platforms.

## 4.3 Environmental Constraints Feedback

The ESG provided feedback on the environmental constraints data to be used in the assessment of environmental and community constraints when developing the HND. This feedback was used to classify the constraints according to the degree of importance using a BRAG (Black, Red, Amber, Green) rating. We have taken these environmental constraints into account when identifying interface point options on a regional basis and when defining route corridor options.

The weighting of environmental influence on the design was questioned by the ESG. The BRAG assessments of route corridors were considered alongside the relevant factors for all the design objectives in arriving at the preferred radial (counterfactual) and coordinated design on an equal footing. All factors were balanced in line with the four objectives as part of the strategic options appraisal to reach the proposed recommendation.

Detailed feedback was provided by the ESG and we were advised of many constraints that should be avoided completely. Unfortunately, it has not been possible for the design to avoid all identified constraints due to the location of potential interface points and the wind farms. BRAG appraisals and routing have attempted to avoid all cabling in key sensitive sites where possible and we have prioritised avoidance of sites where habitats (or other features) have been identified as key sensitivities to cabling (BRAG = Red), these sites include:

- Marine protected areas (MPAs)
- Marine conservation zones (MCZs).
- Special protection areas (SPAs).
- Special areas of conservation (SACs).
- Sites of special scientific interest (SSSI).
- National nature reserves (NNRs).

Where sites cannot be avoided, alternatives have been examined. We provided plans to the ESG with corridors overlaid on designations.

Feedback from the ESG highlighted that further work will be required at the DND stage to minimise environmental impact and consenting risk, given that the HND has not been able to avoid all environmentally sensitive areas and, that compensation should be seen as a last resort. The mitigation hierarchy should be followed and measured to alleviate these potential pressures on sensitive habitats.

Concerns were raised about the detail of the cable route, platform locations and onshore locations; cable burial assessments; requirements for external cable protection; proposed mitigation; and the feasibility of horizontal directional drilling (HDD). These have been unable to be assessed at this stage and will be determined through DND. We continue engagement with ESG throughout this process. The environmental constraints feedback information provided will also be packaged for consideration in the DND.

It was raised that we should consider undertaking a Habitats Regulation Assessment (HRA) and Strategic Environmental Assessment (SEA) for the HND. We sought legal advice on this matter and following careful consideration, we concluded that the HND should not incorporate an HRA and SEA at this stage, due to the risk of the delay. Feedback from a range of stakeholders throughout the process has been for the connection locations and dates to be confirmed as soon as possible. Carrying out a plan-level HRA and SEA would have pushed the timeline well into 2023. The ToR does not require an HND or SEA to be incorporated into the HND. Our understanding is that an SEA or plan level HRA is not required unless the HND becomes more prescriptive or the status of the HND in the planning process if further formalised.

More detail regarding the approach used to assess the environmental and community objectives can be found in the Environmental & Community Assessment Annex of the *HND* report [12].

## 4.4 Codes & Standards Feedback

The November 2021 and May 2022 workshops focused predominantly on the Early Opportunities Models[13], whilst also providing an overview of the potential methodology challenges and associated modifications for network charging related to the HND. The comments and feedback received in these workshops have helped shape the priorities and were taken into consideration whilst developing the *Industry Code, Standard and Licence Recommendation Report*.

Stakeholders appreciated and found the workshops held in November useful, viewing them as a good start to discussing the required code changes stemming from offshore coordination whilst recognising the relative complexity of the task and the limited time available to complete it.

Most of the stakeholders in attendance were code experts, however, were not close to offshore coordination specifically in all cases. Those who attended came away from the sessions with a new understanding of the

[12] https://www.nationalgrideso.com/document/262681/download
[13] https://www.nationalgrideso.com/document/259686/download

key challenges and opportunities brought by offshore coordination, and how the codes and standards may in turn be impacted, albeit at a conceptual and hypothetical level.

Some stakeholders found it challenging to identify specific code and standard change requirements, or which topics should be prioritised. It was considered that this would become easier in light of more specific designs, rather than high-level concepts. Therefore, we shared more specific designs in the May workshop and will hold further workshops following the HND publication.

Stakeholders agreed that prior to the raising of any code modifications, the below should be considered:

- Whether a code modification is the best route of governance or whether an issue could be managed via derogation or bilateral agreements (e.g. if a given issue only affects a handful of projects).
- Potential interactions with existing code modifications or wider reviews to ensure that existing or in-flight code modifications are not undermined, and to avoid unnecessary duplication.
- Ensure technical and commercial codes and principles complement each other. For example, design requirements should complement financial security and Transmission Network Use of System (TNUoS) charging principles to enable offshore coordination, ensuring that technical specifications do not incur overly high TNUoS charges that in turn de-incentivise projects from proceeding.

There was also specific feedback for each code:

| Code | Changes needed based on feedback received | Our response |
|---|---|---|
| Security and Quality of Supply Standard[14] (SQSS) and Grid Code[15] | • Generally, no/minimal change is needed for non-multipurpose interconnector (MPI) concepts and more information on MPIs is needed to identify changes.<br>• Any change needed is dependent on the design. | • This has been further reviewed now the HND is known. Our findings are listed in the *Industry Code, Standard and Licence Recommendation Report.* |
| System Operator Transmission Owner Code[16] (STC) | • No change is needed unless there is a licence change or licensee activity change (likely for MPIs).<br>• This should be reviewed when the delivery model is known. | • This has been further reviewed now the HND is known and Ofgem has released the Delivery Model Minded-to Position[17]. Our findings are listed in the *Industry Code, Standard and Licence Recommendation Report*. This will be reviewed again now the HND is known. |
| Connection and Use *of System Code[18] (CUSC)* | • It was agreed that change may be needed for CUSC sections 13, 14 and 15 but this would require detailed scenarios and assumptions. Further feedback on this is highlighted in table 4.<br>• Other CUSC sections have no or minimal change. | • We held further workshops on charging and provided more detailed scenarios. |

*Table 3: Changes needed for each code and standard based on feedback received*

[14] nationalgrideso.com/document/189561/download
[15] https://www.nationalgrideso.com/document/162271/download
[16] nationalgrideso.com/document/40726/download
[17] https://www.ofgem.gov.uk/publications/minded-decision-and-further-consultation-pathway-2030
[18] nationalgrideso.com/document/141131/download

| CUSC Section | Feedback received | Our response |
|---|---|---|
| Section 13 | • Section 13 needs to be reviewed with respect to any changes in CUSC 14 and 15, particularly the classification of enabling works. | • This feedback has helped to identify the code modifications to the CUSC that need to be raised which are detailed in the *Industry Code, Standard and Licence Recommendation Report.*<br>• These ideas were developed and enhanced to identify three code modifications that need to be made which were presented in the May Charging Workshops. Initially these code modifications were for the Early Opportunities workstream, however they are likely to be required for the HND.<br>• The Ofgem Delivery Model minded-to position helps to inform further thinking on this. |
| Section 14 | • Stakeholders broadly agreed with our presented gaps and enablers to offshore coordination in the CUSC.<br>• Stakeholders would appreciate worked examples to understand the impact on tariffs, application of the methodology and any potential code changes.<br>• As offshore coordination is benefitting the end consumer, there was a question if more costs should be socialised with demand.<br>• From an engineering perspective if the delivery models are the same, they should have the same methodology regardless of asset ownership (Offshore Transmission Owner (OFTO) or TO).<br>• Charge types could vary dependent on the Delivery Model a generator connects to; this could be incentivising connection to certain delivery models. | |
| Section 15 | • Stakeholders broadly agreed with our presented ideas but again suggested some actual examples would help to understand and identify implications on CUSC.<br>• Our interpretation of anticipatory investment (AI) was not disputed.<br>• It was suggested that the share the developer is liable for (vs consumers) in regard to AI may need to be on a sliding scale (i.e. more towards consumers at the beginning, more towards the developer nearer connection).<br>• There was a question about the impact of connection date difference between users coordinating. | |

*Table 4: Feedback on CUSC Sections 13,14 and 15*

We elaborated on the detail of CUSC 14 Charging Methodology following the feedback from the CUSC workshops held in November. From this, we identified three challenges offshore coordination put to the CUSC which we presented in a charging workshop held in May. Initially these code modifications were for the Early Opportunities workstream, however they are likely to be required for the HND. We also introduced worked scenarios and assumptions for each challenge, as requested by the attendees of the November workshops.

| Challenge | Feedback received |
|---|---|
| The allocation of charges between two or more generator users when sharing the same offshore local circuits and substation | • It was suggested that the options should also consider how losses are treated when applying the different solution options.<br>• A concern was raised around the large difference between the suggested code modifications to overcome the challenge and today's standards.<br>• It was suggested that factors such as the effort vs time to build and implement the solution needs to be factored in.<br>• The majority of the external stakeholders showed a preference for splitting the costs between the two generators purely based on their TEC, due to its ease of implementation. |
| Clarity of which wider tariff is applied, when an offshore user is connecting to two onshore nodes that are in different zones | • It was raised that CMP379[19] is holding similar conversations on demand sites that span across multiple demand charging zones. However, industry recognised that this modification is addressing a different challenge.<br>• It was mentioned that the ESO should review existing code modifications to expand the scope and improve consistency prior to raising code modifications relating to offshore coordination.<br>• Stakeholders provided in depth feedback on all five options presented. Whilst all options are complex, creating a new offshore zone is preferable. |
| Any changes required to accommodate the connection of multiple users who are connected at different times, under a generator build option | • A question was raised on what happens if only one connecting party is delayed in a coordinated design.<br>• It was suggested to be consistent with how the onshore network is built.<br>• A question was raised on what happens if the onshore infrastructure is delayed.<br>• There was a question on the local security factor calculation.<br>• It was suggested that decommissioning timescales interaction should be considered.<br>• It was suggested that for the first few projects, it would be useful to show a counterfactual without coordination to demonstrate where the benefit is shown when coordinated.<br>• There was a suggestion of a dedicated user commitment workshop to discuss the implications of offshore coordination regarding user commitment. |

*Table 5: Feedback on CUSC 14 Challenges identified*

There was also general feedback that extending the Main Interconnected Transmission System (MITS) definition would not work well.

Further detail on this can be found in Section 7 of the *Industry Code, Standard and Licence Recommendation Report.*

[19] https://www.nationalgrideso.com/industry-information/codes/connection-and-use-system-code-cusc-old/modifications/cmp379-determining

The comments and feedback received in these workshops have helped shape the priorities and were taken into consideration whilst developing the *Industry Code, Standard and Licence Recommendation Report* and, where required, will eventually be translated into code modifications. We will continue to work closely with developers to discuss whether their projects meet the existing codes and standards or if change is required. This will be incorporated into the connection contract update programme. As per the standard code modification procedure, industry will be engaged before the modification is raised.

The feedback has been reassessed taking into consideration the final recommended design, Ofgem's mined-to delivery model and specific real life HND scenarios. Further workshops will be held in summer 2022 to seek stakeholders' views on this. We will also be seeking written feedback in response to the *Industry Code, Standard and Licence Recommendation Report*.

## 4.5 OAST Feedback

On 29 April 2022, we opened a two-week formal feedback window on the draft recommended design and received **41 responses.** These have shaped our Final HND Recommendation, decisions for the HND follow up process and will be provided to the organisation delivering the Detailed Network Design.

Several feedback responses were marked confidential; this feedback has not been included here but has equally helped shape the HND recommendation. Feedback provided by developers included in the design has been responded to via bilateral discussions in June 2022 and some feedback will be implemented in the HND follow up process or the Detailed Network Design by the organisation taking it forward. Some feedback has triggered changes to the design which the stakeholders who originally received the OASTs can find in an addendum.

Please note that the feedback has been summarised and paraphrased with confidential information redacted.

### General OAST Feedback

General feedback centred around environmental representative feedback, which consisted of a variety of different themes.

Environmental statutory bodies requested more detail in the OASTs to improve understanding and to enable comprehensive feedback to be provided, for example specifying the MPAs affected. This would allow stakeholders to understand the true impact of cable routes, which option is most beneficial for the environment and the reasoning behind the option selection.

This is further enforced by comments requesting weighting of environmental issues and clarity on how marine plans have been considered. Feedback from environmental stakeholders is consistent in terms of requesting visibility on how the environmental impacts have influenced or changed the OASTs. It is also noted throughout feedback that whilst the OASTs do look to mitigate the effects on the environment there is no thought on how to take the opportunity to improve it. We have sought to comply with the HND ToR by considering the environmental impact of the design recommendations as part of the four objects and the *HND* report clearly lays this out. Following receipt of this feedback, we held an ESG meeting to discuss further and provided stakeholders within the group with more detailed maps showing the constraints and recommended design.

There was a suggestion to hold a "lessons learnt" session to discuss how to improve the assessment of the environmental impact in future designs and this is something we will carry out with the ESG following the publication of the HND. As route corridors are not defined at the HND stage, detailed environmental constraints information provided by stakeholders will be packaged up and provided to the organisation carrying out the DND.

There was a concern raised by many stakeholder groups regarding the design being deliverable by 2030 to meet the UK Government's offshore wind targets. We will work further with the TOs to understand the timing of the works required to deliver the design in the DND and there is the need for the commitments outlined within the BESS to be delivered to ensure the design is deliverable by 2030. The *Network Options Assessment (NOA) 2021/22 Refresh*[20] found that there are 94 options required to meet 2030 targets and 11 of those options require acceleration to meet 2030 targets. We have also considered technology readiness and supply chain constraints to ensure the design is deliverable by 2030.

There were requests for further information around cost differentials from stakeholders. We have made changes to the design in response to feedback received and discussed the modified design with impacted

[20] https://www.nationalgrideso.com/research-publications/network-options-assessment-noa

developers. We have also provided an update via the OAST appendix documents, which set out how the design had changed since the coordinated OASTs were shared and the details of unit costs.

Developers expressed a preference for a radial connection due to a lower risk profile, project interdependencies and the need to build more infrastructure than is necessary for their own project. The benefits of radial connections have been considered in the HND and the recommended design is based on the four objectives set out in the ToR. The recommended design offers significant savings for consumers in comparison to an optimised radial design. However, we appreciate that the coordinated design brings additional complexity, and we will support developers through this process.

Several stakeholders requested clarification of the projects in scope for the HND and the reasoning behind scoping decisions. This has been explained to those stakeholders in bilateral discussions.

## North West Region OAST Feedback

Environmental stakeholder feedback included comments on the route to Hunterston which, whilst preferred, would cross and be adjacent to the MPA and SAC. They advised that mitigation would be required at the construction phase to minimise potential negative impacts. In addition to this, the area surrounding Penwortham and north of Warton has many environmental considerations that need to be taken into account such as Neolithic activity, moss, peatlands, and deserted medieval villages. We will continue to engage with the ESG, and this detail will feed into the DND.

Developers in the North West Region collaborated to jointly propose an alternative design in which the wind farms remained coordinated without electrical coordination via an offshore platform. Considering the reduced delivery risk and offshore environmental impact of this alternative, we have modified the recommended design to accommodate the suggestion.

There was also a concern raised about the use of 275 kV connection cables in the design. We believe this will reduce the total number of cables required overall when compared to using 220 kV cables, therefore minimising environmental impact. We anticipate this technology will be readily available when the HND is delivered and have verified this with technology providers.

It has also been noted that the planned grid connection date and timeline of works are of concern. We understand the need for earlier connection dates, so we are working with the TOs to review the possibility of earlier connection dates in light of the announcements in the BESS. Whilst the *HND* report describes the design principle, we will work with developers and Ofgem to define how the coordinated offshore works will be delivered. A full list of enabling works will be provided in the *HND* report for the region and the specific enabling works for connections including Earliest In Service Dates (EISDs) for these will be provided as part of the connection contract update programme.

## South West Region OAST Feedback

We received feedback from a variety of stakeholder groups on the South West Region design. Due to the outcome of The Crown Estate's Celtic Sea Leasing round[21] not yet being known, which is not anticipated to be announced until Q4 2023, there were multiple recommendations on the approach to the design. We recognise that the HND follow up process will need to incorporate the expected full leasing round outcome rather than 1 GW, which was the capacity anticipated when the scope for the HND was agreed. As a result of this, the design for the South West Region is not a firm recommendation and does not relate to specific projects. We will further consult with The Crown Estate, NGET and affected developers throughout the follow up process.

Many stakeholders felt that it would be advantageous to consider years beyond 2030 when comparing the costs of different design options. We have subsequently updated our economic analysis to consider years beyond 2030. This meant that the optimal design no longer included the link to Alverdiscott. As this was also beneficial from an environmental perspective as it removed a landing point, the design recommendation was updated.

[21] https://www.thecrownestate.co.uk/en-gb/media-and-insights/news/the-crown-estate-develops-proposals-for-floating-wind-in-celtic-sea-outlining-4gw-opportunity/

## East Coast Region OAST Feedback

It was noted by some offshore developers that they would benefit from the identification of connection dates. All projects in the HND are aiming to be connected by 2030. This will be confirmed in the connection contract update programme running throughout summer and autumn 2022.

It was suggested that it would be beneficial to understand the assumptions made regarding the East Coast coordinated links, particularly how much capacity will be utilised in improving north to south network capability or for the second phase of the HND. This is to understand the dependencies between projects in the designs including the extent to which projects in one region are reliant on the completion of onshore work and the connection of generation in other regions. This will be addressed in the DND and Ofgem's Delivery Model Outcome.

It was recommended that the HND needs to provide a more agile approach to its considerations by using a least regrets investments analysis, as the benefits and constraints are unlikely to remain consistent through to delivery. Using a method such as this would allow wider strategic and qualitative inputs which would assist not only in terms of cost reduction but deliverability. We recognise the benefits of such an approach, which is similar to that used in the *NOA 2021/22 Refresh*, but equally there is a desire for developers to have certainty over the design of their connection and TOs on the network reinforcements required. We will consider this further as part of the follow up process. As part of the connection contract update programme, we will also be including a modular build consideration.

It has also been requested that we provide more clarity on the anticipated equipment costs and any assumptions behind constraint costs. A breakdown of assumed costs for cables, converter stations, and offshore platforms was requested. We have therefore provided Unit Costs to the same set of stakeholders that the OASTs were shared with.

The 2030 deliverability came into question amongst several of the comments provided by stakeholders. We recognise that deliverability by 2030 is crucial to meet the UK Government's ambitions and this will be looked at further in the DND.

It was noted by stakeholders that the first phase of the HND covers less than half of ScotWind's anticipated capacity requirement. The further ScotWind projects will be included the HND follow up process.

In order to balance environmental factors alongside the needs of the transmission system, environmental stakeholders understood the need to connect Scottish projects to the east coast.

A developer shared a preference for a connection to Weston Marsh. As a result of this feedback, a Weston Marsh sensitivity analysis has been completed, and we found that there has not been an improvement on the connection timescale due to the EISD of the onshore works required. This detail of this has been communicated with the developers it concerns.

## North Scotland Region OAST Feedback

As part of the feedback received for the North Scotland OAST, the issue of resilience was raised.

Future proofing the design is considered necessary to cover all anticipated ScotWind leasing requirements and to anticipate potential tidal stream and Innovation and Targeted Oil and Gas (INTOG) to feed into the network. The projects within the scope of the follow up process are yet finalised at the time of publication. This will be further considered in the HND follow up Process.

Environmental stakeholders recognised that overall, the coordinated approach meets the criteria for the most cost effective and environmentally stable. However, the use of Landscape and Visual Impact Assessment (LVIA) has been advised when considering onshore work and the potential impact on the environment. This is something that will be considered as part of the DND by the organisation taking it forward.

# 5. Wider engagement

Alongside our consultative approach, wider stakeholder engagement has also been undertaken through interconnector forums, Offshore Transmission Owner (OFTO) forums and our *Autumn Progress Publication*[22]. The purpose of the OFTO forums has been to raise awareness of the project and consult with OFTOs on the technical detail of the connection process and what they consider to be potential blockers to connecting offshore wind. This has not only been an information gathering exercise but also an opportunity to co-create and work jointly to try to resolve and find solutions to blockers.

Whilst our developer engagement has been focused on those in scope for the Holistic Network Design (HND), we have provided equal feedback opportunities to the developers with a seabed lease in scope for the HND follow up process, which includes the remainder of the ScotWind projects. We have held separate engagement for developers that have not yet secured a seabed lease but could be in scope for the follow up process and have targeted our engagement for their needs. We have hosted two Innovation and Targeted Oil and Gas (INTOG) developer webinars and a Celtic Sea developer webinar to discuss the approach to their region and possible inclusion in the HND. The developers in these regions have specific challenges due to the floating wind farms and substations in the Celtic Sea and the combination of demand and generation in a constrained part of the network for INTOG. We ensured that these webinars were an opportunity for these developers' concerns to be listened to and considered.

We have engaged with technology providers to check technology readiness for 2030. Their feedback has helped shape the design, we have used it to define cable ratings and chosen to exclude direct current circuit breakers (DCCBs) from the design as it is not expected they will be in use by 2030.

We recognised that there is strong political interest in the Offshore Coordination project, both in meeting the UK Government's Net Zero targets and by Members of Parliament (MPs) representing communities accommodating the onshore infrastructure in the HND. In January, we outlined the HND scope, purpose and process in a NOA webinar for Councils in the East of England. Once we had developed a draft design, we wrote to MPs in coastal areas that could be impacted by the design and offered to hold discussions. We also held a drop-in session in Parliament to provide MPs with the opportunity to understand the proposals in the HND better. In addition, following the delivery of the HND, we will be offering further sessions with local authorities and MPs across Great Britain for further discussion.

[22] https://www.nationalgrideso.com/document/214981/download

# 6. Conclusion & Next Steps

We thank stakeholders for taking the time to work with us and set the direction for the future of offshore wind to help deliver the UK Government's commitments to net zero while minimising the impact on consumers, communities and the environment.

The feedback received has been crucial to the creation of the Holistic Network Design (HND) and will continue to be in the future stages of implementation. Other feedback will shape how future processes are progressed to ensure efficiency while satisfying the objectives.

We have also sought feedback on our general engagement, including on our *Autumn progress publication* and subsequent webinars. In response to this feedback, and the insights shared with us, we have made five commitments to improve stakeholder engagement[23]. We hope that this report has demonstrated that these have been met and we will continue to strive to improve our stakeholder engagement. These are:

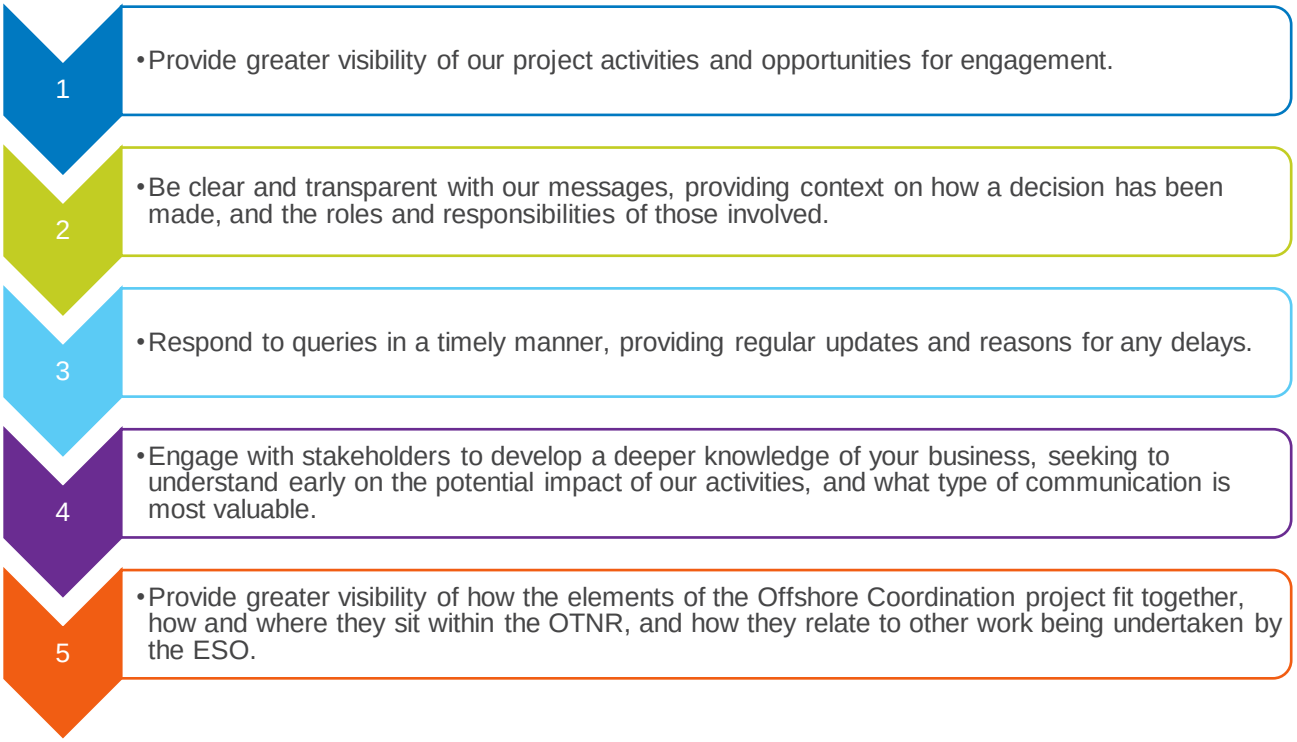


*Figure 6: Our five stakeholder engagement commitments*

Both we and our stakeholders understand substantial work needs to continue at pace to deliver the recommended design. We will drive progress where this is within our remit, under the overarching direction from the OTNR.

We are currently developing the HND follow up process which aims to provide in-scope developers with follow up recommendations in Q1 2023. We will start engaging with developers that are in scope and other stakeholders in summer 2022, applying lessons learnt and feedback from stakeholders from the HND. Some of our initial thoughts are to:

- Continue to engage with developers and TOs throughout the design process, including regional engagement where appropriate.
- Invite developers to take part in design recommendation decisions earlier in the process.
- Continue to provide greater transparency as early in the process as possible.

[23] https://www.nationalgrideso.com/document/239471/download

The information provided in the HND will inform the DND, which will set out the next level of detail for the required network assets. It is at this stage of the process that route corridors and technology choices will be selected, and statutory consultation is carried out. This will address many stakeholders' concerns around consenting and technology requirements and there will be a consultation opportunity regarding community impact.

The connection contract update programme will commence. Developers impacted will be informed and we will continually engage with them as they enter an Agreement to Vary, which is the legal document signed to make a change to a developer's contracted position with the ESO and TO.

There are many remaining uncertainties related to the design and delivery model in the context of codes and standards. We therefore recommend a period of further analysis and stakeholder engagement and prior planning to further engage with industry stakeholders throughout summer 2022. This will have the aim of formally raising any necessary code and standard modifications in autumn 2022, subject to an assessment of urgency and priority. We will work with industry stakeholders, including via the OTNR Expert Advisory Group Codes and Standards subgroup, on when code and standard changes are necessary and the content of the code and standard changes. You can also find information on how to join subgroups on the ESO website[24].

Please contact box.offshorecoord@nationalgrideso.com to be added to the ESO Offshore Coordination distribution list or if you have any questions, queries, or further feedback.

[24] https://www.nationalgrideso.com/future-energy/projects/offshore-coordination-project/latest-news