ESO

HND Impact Assessment – North Cluster outcome summary

February 2024

Brief overview

In July 2022, we published the first Holistic Network Design[1] (HND) setting out a single, integrated design that supports the large-scale delivery of electricity generated from offshore wind, taking power to where it's needed across Great Britain. Since the publication of the HND, Transmission Owners (TOs) and in scope offshore wind developers with non-radial connections have started to produce the Detailed Network Design (DND).

As part of the DND phase, TOs and developers consider the designs in more detail and potential design changes are to be expected. This required us to develop a process to assess the impact of these changes, against the baseline of the HND, using the four HND design criteria. These changes may include a change in technology, a change in cable route or length or a change of network configuration that would have a material impact on the design criteria. We developed this process during summer 2023 with input from stakeholders and have referred to this as the HND Impact Assessment process[2].

Deviations from the recommendations may have wider implications for the transmission network and other industry processes. It is important that we understand the full impact of any design changes, as there may be consequences that are not immediately obvious, and we are best placed to conduct this holistic assessment.

Submission

On 18 October 2023, we received the first Impact Assessment from Scottish Southern Electricity Networks Transmission (SSEN-T) with a design change on behalf of HND parties which were due to be electrically connected off the east coast of Scotland and England. These parties are known as the “North Cluster” (given their location in relation to other HND projects) and include SSEN-T, NGET, BP-EnBW (Morven) and Renantis (Bellrock). The group submitted three categories of designs, exclusively looking at the options for cabling technology and configurations from the offshore platform arrangements of Morven Windfarm to the landing point connection onshore at Hurlie (Fiddes). This circuit Fetteresso – SW_E1a was applied a classification of Onshore, TO build in the Ofgem decision on asset classification 19 October 2022.[3] The request follows a recent AC cable assessment which has identified a reduced ability to transmit high volumes of power securely along long offshore AC cables without significant reactive power compensation.

Outcome

The Impact Assessment has identified a design which presents benefits across several Network Design Objectives compared to the original HND design (the ‘baseline’). The best performing design, referenced as Category C (see map below), performed more favourably against the HND design objectives than all other categories put forward.

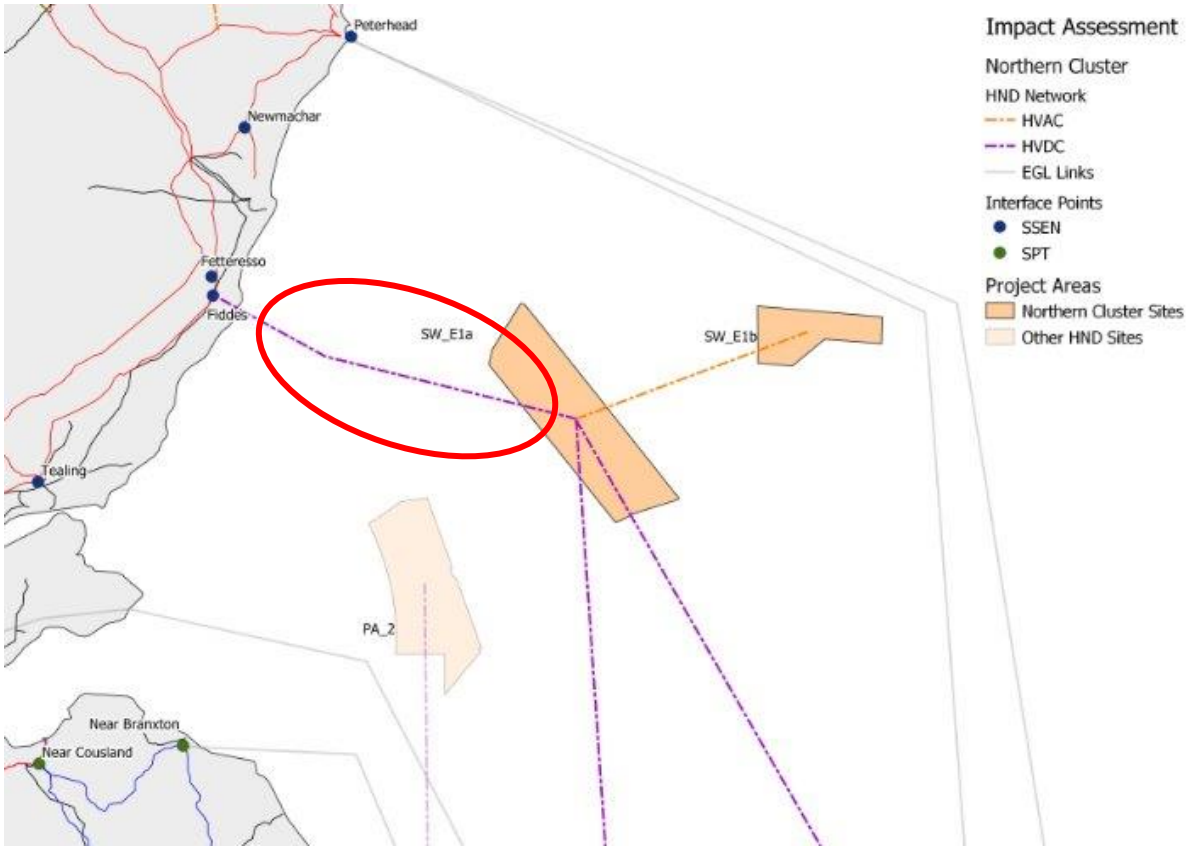
When compared with the HND recommendation, the Category C design provided:

- Regional Environmental benefits, due to a reduction in cables and trenches required when switching to the HVDC technology proposed.
    - HND Baseline – HVAC 4 cables in 4 trenches

[1] The Pathway to 2030 Holistic Network Design | ESO (nationalgrideso.com)
[2] Offshore Coordination Project | ESO (nationalgrideso.com) – see “Progressing delivery of the Holistic Network Design (HND)” section
[3] Offshore Transmission Network Review: Decision on asset classification | Ofgem

  - Category C – 2 HVDC cables in 2 trenches
- Marginal Economic increase in overall cost (£1.1b) due to challenges in the supply chain for transmission assets and increases in the cost of Offshore equipment. Notwithstanding this, costs for Category C design are more favourable than all other deliverable options due to reduction in number and length of cables required and removing the need for a Mid-Point compensation platform.
- Operability benefits in providing a simpler more achievable design, a problem has been identified with HVAC cables at this capacity and distance which would make them exceedingly challenging to operate without expensive and untested remediation.

There are complexities and risks of operating both the AC and HVDC options, however we concur with the conclusion presented by SSEN-T that the original HND recommendation for this specific section of infrastructure is no longer deliverable. We are working with equipment manufacturers through our deliverability forum to keep our design assumptions up to date.



(Map showing the Category C design change for the HND North Cluster – locations are illustrative and not to scale)

Governance

On 7 February 2024, this outcome was presented to the Offshore Transmission Networks Review (OTNR) Transmission Networks Board (TNB) in order to ratify that the necessary considerations had been applied. This is consistent with the approval sought for HND and HND Follow up Exercise (HNDFUE). We presented the outcome of the assessment and an explanation of the process that we followed, in order to provide sufficient evidence to the group to demonstrate that we had followed the required process and ask for their sign off. The group confirmed they believe the required process had been followed, which means the outcome of the Impact Assessment is now finalised.

Next Steps

When available, we will publish Ofgem's response to our letter communicating the outcome of the North Cluster Impact Assessment, which will advise if Asset Classification is required or that the original asset classification of the HND is still appropriate.