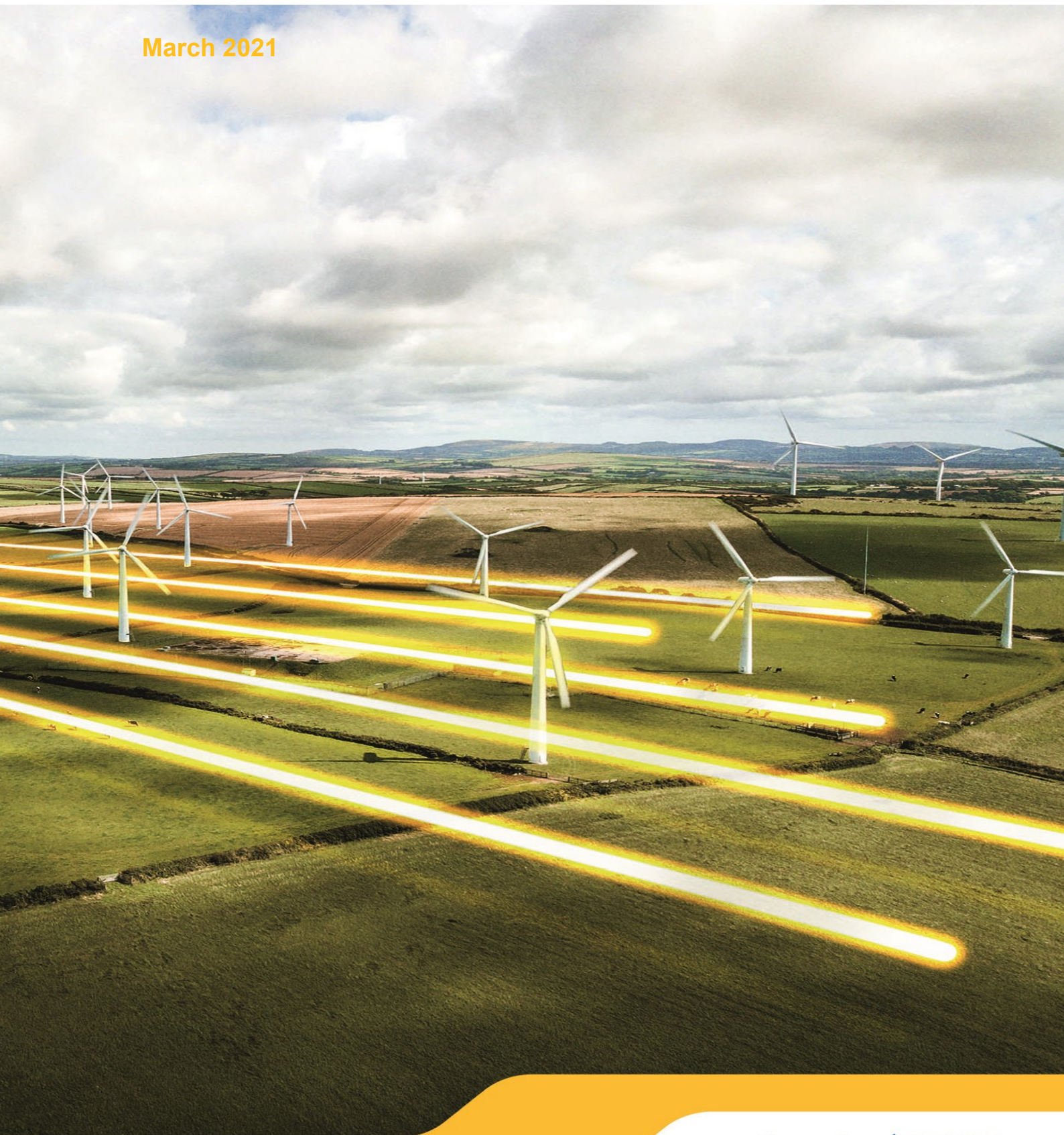


# Scope of TO and DNO Connections Review: NOA Voltage Pathfinder Tender - Pennine and North England

March 2021



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## Introduction

This document presents the scope of the connections review process that will be undertaken by the Transmission Owner, National Grid Electricity Transmission (NGET) and the Distribution Owners, Northern Powergrid (NPG) and Electricity North West (ENWL) for North England & Pennines tender participants. The ESO will coordinate the connections review process.

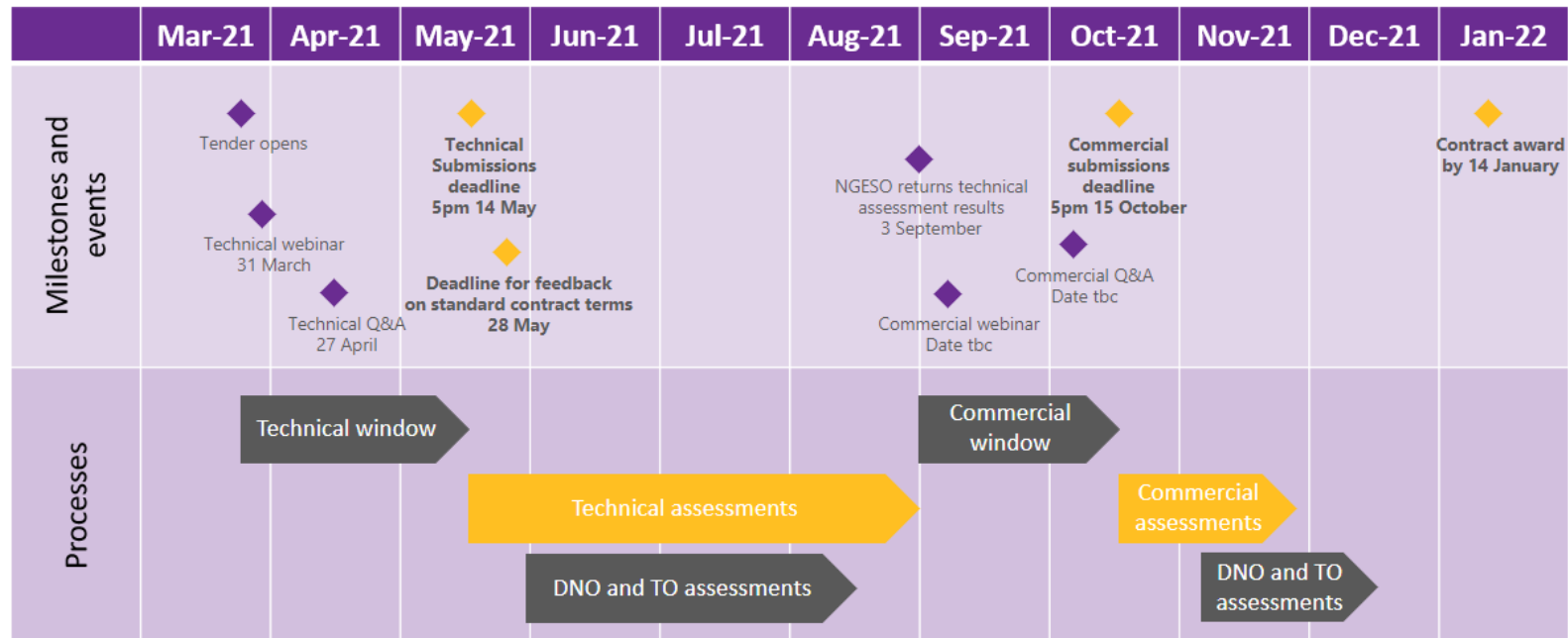
It is not a pre-requisite for participants to have a connection agreement in place in order to participate in the Voltage Pathfinder, the connections review process has been included in the tender timeline. This is to provide enough confidence to the TO, DNOs and ESO that any proposed solutions could safely connect to the network. It also provides tender participants with an indicative view of the deliverability and cost of connecting their solutions to the network to support their commercial tender.

Please note that the connections review process is only to facilitate the tender. Any successful tender participants will be required to submit a connection application and go through the formal connections process after the tender results have been announced.

Solutions which are eligible to participate in the tender and already have connection offers and do not require any modifications to their existing agreements, will not require a connections review.

## Timeline and Key Milestones

The timeline below shows how the connections review (DNO and TO assessments) fits into the entire Pathfinder timetable, while the table beneath gives key milestone dates for the connections review element (only).



<b>Key Milestones</b>	<b>Proposed Dates</b>
Tender participants submit tender proforma	14 May 2021
NGESO will check that all tender submissions meet the minimum requirements	17 May – 28 May 2021
NGESO will provide all the relevant technical information to the respective TO & DNOs for the connections review process.	28 May 2021
TO and DNOs will conduct the connections review with regular engagement with ESO.	31 May – 20 Aug 2021
TO and DNOs will return outcome of the connection review process to NGESO.	20 Aug 2021
NGESO will review the information and discuss with the TO and DNOs.	23 Aug – 03 Sept 2021
The final outcome of the connection review process will be provided to tender participants.	03 Sept 2021

## Scope of Connection Review Process

This section summarises the activities that will form part of the scope of the connections review process. This assessment will apply to new solutions which do not have a connection offer or to solutions which are already connected but require modifications to their existing connection agreements to deliver the reactive power service.

Note that the below applies to projects that meet all the minimum requirements, as per the review and screening to be conducted between 17 May and 28 May.

### 1. Technical impact assessment for each solution

- Based on the technical information provided by tender participants, the TO and DNOs will conduct a set of technical studies to determine the network impact of each solution and the level of reinforcements required to enable a connection to their networks.
- The scope of studies will include fault level assessments, power flows and voltage assessments including voltage step changes for each proposed solution. These assessments are similar to those which would be usually conducted as part of the normal connections process.
- Complex studies assessing the impact on system stability, power quality, sub-synchronous interaction, protection, etc. will not form part of the scope of the connections review process. With regards to connections at transmission level:
  - We would draw attention to the obligations to be placed on connectees through the Bilateral Connection Agreement (BCA) for meeting AC System Voltage Variations, covering TOV (Grid Code CC.6.1.4, and TGN(E) 288 requirements) and Electromagnetic Transients, Voltage Fluctuations and Transformer Energisation, covering inrush (Grid Code CC.6.1.7) requirements.
    - Standard BCA templates can be found on the NGESO website at: <https://www.nationalgrideso.com/document/33976/download>
    - TGN(E) 288 can be found at the following location: [https://www.nationalgrid.com/sites/default/files/documents/TGN%28E%29\\_288\\_0.pdf](https://www.nationalgrid.com/sites/default/files/documents/TGN%28E%29_288_0.pdf)
  - Steady state analysis has determined that inductive shunt compensation (i.e. reactors) at Stocksbridge 400kV **must be at least 200MVar in size** (and not variable or tappable), since lower values of MVar absorption may give rise to onerous resonance conditions that could require mitigation measures in order to satisfy the above connection conditions.
  - Participants should make allowance for meeting these above requirements in their submissions. The following CIGRE Technical Brochures provide useful guidance: 556 – Power System Technical Performance Issues Related to the Application of Long HVAC Cables. 568 – Transformer Energisation in Power Systems: A Study Guide
- **Please note:** It will not be possible to change the technical parameters during and following the completion of the connection review process as this would have an impact on the connection design, reinforcements and connection costs. It is therefore important that, as part of the technical submission, tender participants provide the details of the best option(s) that they would like the TO and DNOs to assess and ensure that any DRC or technical data provided is as accurate as possible.

- The technical analysis will be based on assumptions agreed between the ESO, the TO and DNOs, in line with the normal connections application process and considering the backgrounds on which the requirement was identified.

## **2. Network reinforcements/ works and associated infrastructure costs that are required to connect the solution to the network**

As part of the connections review process, the TO and DNOs will provide an indicative view of the works that would be required to connect solutions to their networks and the respective indicative costs and lead times for such works. The outputs of these assessments are described in the section on the “outputs of the connection review process”.

## **3. Site Assessment**

- This will involve a desktop review of sites to determine the available options for connecting the proposed solutions e.g. availability of spare bays, possibility of busbar extension etc.
- It will provide a high-level review of site complexities (civils, ongoing works at sites etc.) that could have an impact on infrastructure costs and delivery timescales.
- The TO will provide an indication on non-operational land availability (further details are provided towards the end of this document). For substations without land or in the DNO network, tender participants will need to undertake their own investigations on what is available.

## Output of the Connections Review Process

### Transmission Connected solutions

Following the connections review assessment process, the following information will be provided to the tender participants.

- List of TO works/ reinforcements required to enable a connection to the network.
- Lead time and earliest in-service delivery date (EISD) for the TO works/ reinforcements.
- High-level programme to deliver TO works/ reinforcements.
- Site specific risk of interaction with existing connection applications or applications in flight or out for offer with other customers
- Site-specific indicative costs involved in connecting the solution(s) to the network. Infrastructure costs will be provided in the form of a spend profile with an agreed price base. Where connection assets are applicable, the associated connection charges will be provided.
- A review of non-operational land will be provided by the TO, however, no land cost information will be provided at this stage. There will be a commercial charge at full market rate for the use of National Grid's non-operational land and for the purposes of the commercial tender phase, participants will need to make their own assumptions on the land cost in line with existing markets rates in the respective locations.

### Notes

- Categorisation of infrastructure and connection assets (if applicable) will follow the principles laid out in the CUSC Section 14- Charging Methodologies. Please note that for some designs, the connection boundary may be different from the standard definitions in the CUSC.
- Infrastructure costs are not directly borne by the tender participant but will need to be secured for by the tender participant. The infrastructure costs will be accounted for in the economic assessment stage by the ESO and do not need to be included in the commercial bid of the tender participant. The tender participant will need to account for any costs for the provision of security in their commercial submission.
- Connection charges (where applicable) and costs of user assets will need to be accounted for by the tender participant in their commercial submission.

### For Distribution connected solutions;

Following the DNO assessment, the following information will be provided to tender participants.

- For the North East region, Effectiveness (%) for each solution at the respective GSP(s). For the West Yorkshire area, the MVAr change at the Grid Supply Point busbars.
- If applicable, the lowest operating power factor that can be accommodated without the need for reinforcements. If a specific request is made in the tender proforma, ENWL and NPG will determine network reinforcements that will enable operation at a different power factor.
- List of DNO works and any reinforcements required to enable a connection to the network.



- Earliest delivery date for the DNO works and reinforcements.
- Site-specific indicative costs involved in connecting the solution(s) to the network or enabling the reactive power absorption service, including the reinforcements. All costs will be budgeted based on desk top assessments with indications where assets would be sole use and which the customer would be charged on an apportioned basis.
- Indication of whether the DNO network can facilitate meeting the requirements availability factor (90% or 95%). For example, a provider connected to a radial circuit typically on outage for 50 days of the year would not be able to meet this.

## Clarification on the Connections process

### Connection

- Tender participants should familiarise themselves with the five part connections application process described [here](#).
- The outcome of the connections review process is not binding and is the best indicative view that can be provided at the point of issue. Any successful tender participant will still require a formal connection offer following the announcement of the tender results.
- At the point where the successful tender participants submit a connection application, it is recognised that the generation background may have changed from that studied during the connections review process, due to new connection applications that may have been made or signed, or connection agreements that may have been terminated.
- Successful tender participants who do not have a connection offer will need to submit a connection application after the announcement of the tender results.
- The TO and DNOs will take the connection application process into account when developing the programme and earliest connection dates (i.e. 7 months – 3 months for offer and 3 months for acceptance and one month for NGENSO to sign and return to the respective TO or DNO).
- All requirements and obligations from Grid Code, SO-TO Code, CUSC, NETS SQSS will apply. Any specific requirements will be reflected in the BCA when a connection offer is issued.
- All user assets/ works will be delivered by the tender participant who will seek and ensure they have all necessary consenting rights, permits, land rights and access. The tender participant also needs to ensure they have the appropriate licenses to deliver the service.

## Clarification on non-operational land and operational boundaries

### Non-Operational Land

- Participants wishing to connect to a transmission site and require information on non-operational land should complete the “Enquiry form for Use of National Grid Land” document included with the tender pack.
- Whilst non-operational land information will be provided as part of the TO connection review, it does not mean that it is available for use (i.e. the land may not be surplus, or there may be ongoing discussions about this land with another customer etc)
- Land agreements such as easements and leases will be required across the non-operational estate and land rights agreed will be at market rates
- There will be a commercial charge at full market rate for the use of National Grid’s non-operational land. Examples of National Grid’s standard Heads of Terms for leases will be provided when we return the technical review information.
- An Interface Agreement will be required for rights at the point of connection (operational area)
- The land rights and permitted development associated with operational land are linked to NGET licence and duties under the act and can only be used and exercised by NGET
- Tenderers will require their own land and all necessary consents and permits in their own right
- If a site is adjacent to the NGET operational site, tenderers should seek to ensure their own access rights to their site. Open access through an NGET site isn’t possible without NGET staff in attendance. However, NGET will work with successful tenderer to reach a practical solution as long as it does not impact upon the safety and operation of the site and NGET’s obligations and duties under its licence and act to protect and operate the transmission assets.

### Operational Boundary

- Only user connection assets can be situated within NGET operational boundary
- The Operational boundary cannot be moved to include the successful tenderers assets other than connection assets