

Scope of Connections Review Process for the NOA Stability Pathfinder Phase 2 Tender

June 2021



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1. Introduction

This document presents the scope of the connections review process that will be undertaken by SP Transmission and SSEN Transmission for tender participants who do not have / will not have a connection agreement in place ahead of the economic assessment stage of the tender. The ESO will coordinate the connections review process.

Given that having a connection agreement in place is not a pre-requisite for participating in the NOA Stability Pathfinder phase 2 tender, the connections review process has been included in the tender timeline. This is to provide enough confidence to the TOs and ESO that any proposed solutions could safely connect to the network as well as to provide the tender participants and the ESO with an indicative view of the deliverability and cost of connecting their solutions to the network as a means to support their commercial tender.

Please note that the connections review process is only to facilitate the tender. Any successful tender participants who do not already have a connection agreement in place will be required to go through the formal connections process after the tender results have been announced.

It is recognised that, at the point where successful tender participants may submit a connection application, the generation background may have changed from what had been studied as part of the connections review process due to new connection applications that may have been signed or connection agreements that may have been terminated which may result in a connection solution deviating from the solution identified in the connections review.

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. However, the relevant information such as cost and delivery dates will be derived from their connection offers to facilitate the economic assessment.

2. Timeline

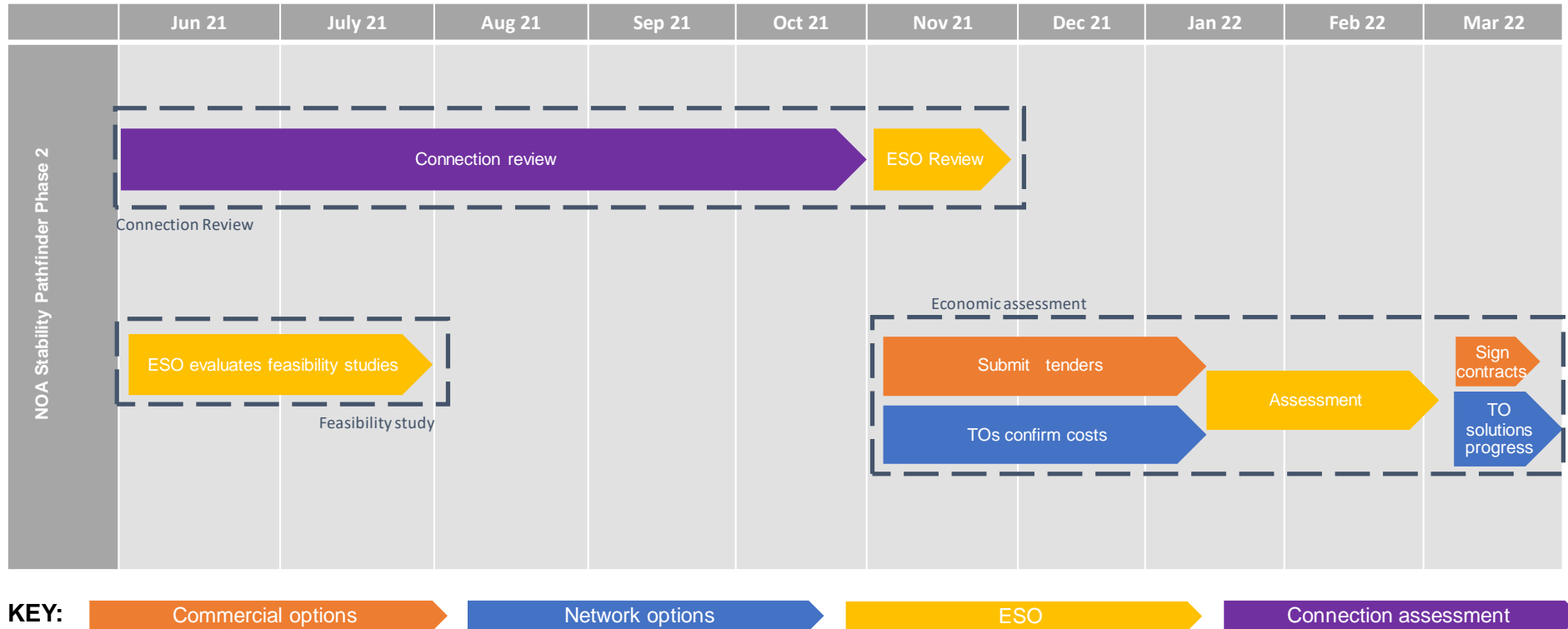


Figure 1 – Timeline of Stability Phase 2 tender (see updated [timeline](#))

The above timeline is based on the formal agreements now in place between NGESO and the Scottish TOs to carry out the connections review process. Please note that while all parties will endeavour to achieve the above dates, these may be subject to change dependent on parties' ability to maintain this programme alongside other statutory obligations.

Key Tasks	Proposed Dates
NGESO to collate and review all the relevant information from tender participants received as part of the EOI	COMPLETED
For participants who pass the EOI, NGESO will provide all the relevant technical information to the respective TO for the connections review process.	COMPLETED
TOs conduct connections review with regular engagement with ESO	Start of Jun 2021 to end of Oct 2021*
Outcome of connections review process returned to NGESO	End of Oct 2021*
NGESO reviews the information and discusses with TOs	June to End of Nov 2021*
Outcome provided to tender participants	End of Nov 2021*

Table 1 – Key Milestones

*timeline is dependent on TOs ability to complete work alongside other statutory obligations

3. Scope of Connections Review Process

This section describes the activities that will form part 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 stability service.

Since publication of the Expression of Interest (EOI) pack, and due to the very high number of submissions received, we have been working closely with the Scottish Transmission Owners (TOs) to refine the scope of the connections review assessment to ensure that the review could be carried out in reasonable timescales while still ensuring sufficient information was provided to allow a robust assessment of the submitted solutions. The main changes to the scope of the connections review process have been to remove the need for the TOs to carry out assessments of the MW and MVAR capacity at connection sites that meet the criteria to be identified as being a Main Interconnected Transmission System Substation (MITS Substation) as defined in the Connection and Use of System Code (CUSC) and to refine the scope of the MW and MVAR assessments carried out at sites that do not meet the CUSC definition of a MITS Substation.

Under the Connect and Manage arrangements, a customer whose connection triggers post-fault overloads on the MITS may be able to connect to the network ahead of MITS reinforcement works with any post-fault issues being managed through operational measures on either a short-term (i.e., until the identified reinforcement works are delivered) or enduring basis (i.e., should ongoing operational management be more economic for consumers than the cost of reinforcement). It has been assumed that this would be the case for any participants with solutions connecting at MITS substations and hence connection timescales and costs for these customers will reflect only the works required to achieve connection at the MITS Substation and to resolve any identified fault level issues.

The refinement of the MW and MVAR assessment to be carried out at non-MITS substations involves restricting the scope of the analysis to only MW and MVAR export conditions (e.g., the importing conditions for batteries will not be studied). Exporting conditions are generally expected to represent the worst-case conditions at any site.

These changes have been necessary to ensure the Connection Reviews process could be completed in timescales that minimise the delay to the overall programme of the Stability Pathfinder while still providing sufficient information to carry out a robust assessment of tendered solutions.

A full assessment of connection requirements and operational implications would be carried out by NGESO and the relevant TO as part of the formal connection application that would have to be made by a successful participant. There is therefore a possibility that this formal connection application process identifies a requirement for further works that could affect the timescales and cost of connection.

Technical impact assessment for each solution

- Based on the technical information provided as part of the Expression of Interest (EOI), the TOs 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 the network.
- The scope of studies will include fault level assessments for each proposed solution and power flow assessments for solutions at sites that do not meet the criteria of MITS Substations. The methodology for these assessments is similar to that which would be usually conducted as part of the normal connections process.
- Complex studies assessing the impact on system voltage, stability, power quality, sub-synchronous interaction, protection, etc. will not form part of the scope of the connections review process.

Notes

- It will not be possible to change the technical parameters (please see the EOI template for details) during and following the completion of the connections review process as this would have an impact on the connection design, reinforcements and connection costs.
- As part of the EOI submission template (see section 5c- Project Details), tender participants were able to state their preference with regards to the type of connection to be explored i.e. SQSS compliant connections or connection design variations. Where possible, the technical studies and identification of network reinforcements will be carried out in accordance with the option chosen. Please note that where a design variation would result in a provider's availability to be lower than 90%, the solution would not be eligible in the first instance to progress in the tender. However, if the full requirement cannot be met in the tender with this constraint, the 90% availability criterion may be relaxed. The TOs will comment on whether certain design variations would have an impact on service availability below 90%.
- The technical analysis will be based on assumptions agreed between the ESO and the TOs, the details of which have now been confirmed between all parties.

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

The following activities will also form part of the connections review process to provide an indicative view of the TO works that would be required to connect solutions to the network and the respective costs and lead times for such works.

- Identification of TO works / reinforcement required to enable a connection at the proposed connection site, categorising them into infrastructure assets, connection assets (if applicable) and user assets. Please note that user assets will be the responsibility of the tender participants.
- Identification of TO works / reinforcement required to resolve any fault level issues, at both the connection site or any other affected substation, caused by connection of a solution.
- Identification of any TO works required to resolve thermal overloads on infrastructure between the connection site and the Main Interconnected Transmission System (MITS). If a solution is proposing to connect at a site that meets the criteria to be identified as a MITS substation, no analysis of thermal overloading on the MITS will be carried out.
- High-level assessment of lead time and earliest in-service delivery date (EISD) for the TO works / reinforcements, considering outage and delivery resource requirements / availability.

- Development of a high-level programme of TO works / reinforcements.
- Evaluation of indicative infrastructure costs and connection costs (if applicable) involved in connecting the solution to the network.

Notes

- Categorisation of infrastructure and connection assets (if applicable) will follow the principals 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.
- The scope and cost for works required to provide the connection between a TO's substation and the participant's assets (e.g. the location of the battery or synchronous compensator), i.e. user works, will be the responsibility of the participant and should be considered by the participant in their commercial tender submissions. The TO connections review will not assess or specify the required user works.

Site Assessment

- A desktop review of sites will be carried out as part of the connections review assessment to determine the available options for connecting the proposed solutions e.g. availability of spare bays, possibility of busbar extension etc.
- A high-level review of site complexities (civils, ongoing works at sites etc.) that could have an impact on infrastructure costs and delivery timescales.

Notes

- Information about land availability for user works and assets will be the responsibility of the tender participant and will not be an output of the connections review process in line with the existing connections process.

4. Output of the Connections Review Process

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

- List of TO works / reinforcement required to enable a connection at the proposed connection site(s).
- For all solutions, confirmation of whether the solution can be accommodated without the need for TO works / reinforcements to resolve fault level issues.
 - If a solution cannot be accommodated without TO works / reinforcement to resolve fault level issues, the scope of works / reinforcement required will be provided.
- For solutions at sites that are not defined as MITS Substations, confirmation of whether the proposed MVA capacity of the solution can be accommodated without causing thermal overloads on network infrastructure between the connection point and the MITS.
 - If the proposed MVA capacity cannot be accommodated without the need for reinforcement, the participant will be informed of the maximum MVA capacity that can be accommodated without reinforcement.
- Lead time and earliest in-service delivery date (EISD) for the TO works / reinforcements.
- High-level programme to deliver TO works / reinforcements.
- Indicative costs involved in connecting the solution(s) to the network. Total infrastructure costs will be provided in a price base agreed between the ESO and TO. Where connection assets are applicable, the associated connection charges will be provided.
- A single line diagram with clear demarcations between the TO infrastructure assets, connection assets (if applicable) and user assets.

5. Additional Notes

Connection

- 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 what had been studied as part of the connections review process due to new connection applications that may have been made or signed or connection agreements that may have been terminated, which may result in a connection solution deviating from the solution identified in the connections review.
- Successful tender participants who do not have a connection offer will need to submit a connection application no later than 2 weeks after the announcement of the tender results and application clock started no later than 1 week after submission, thereby allowing 3 weeks between tender results and connection clock-start. The TOs will take these timescales into account when developing the high-level programme.
- The connection application process will also be taken into account when developing the programme (i.e. 7 months – 3 months for offer and 3 months for acceptance and one month for NGESO to sign and return to the respective TO).
- All requirements and obligations from Grid Code, CUSC, NETS SQSS will apply. Any specific requirements will be reflected in the Bilateral Connection Agreement (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.