Making a positive difference
for energy consumers

Nicholas Harvey
National Grid House
Warwick Technology Park
Warwick
CV34 6DA

Direct Dial: 020 7901 7060
Email: Min.Zhu@ofgem.gov.uk

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Dear Nicholas,

**Approval of 2019 Network Options Assessment methodology**

Thank you for submitting the fifth Network Options Assessment (NOA) methodology, which incorporates a chapter on the NOA for Interconnectors (IC).[1]

We[2] have reviewed the NOA methodology to consider whether it meets the requirements set out in standard licence condition C27 of the National Grid Electricity System Operator (NGESO) electricity transmission licence ("C27"). Our review has included reviewing the changes made to the methodology, compared to the 2018 methodology, to ensure that these are reasonable and help contribute to investment recommendations that are in existing and future consumers' best interests.

We are satisfied that the 2019 NOA methodology meets the requirements of C27, including in terms of developing the NOA methodology and consulting with stakeholders.

*NOA methodology (not including chapter on IC)*

We note NGESO has made two main changes to the methodology this year to incorporate new analysis it has trialled to look at issues that are emerging on the transmission system.

The first of the changes is a new process to assess potential control options to help manage the issue of high voltage, which is becoming an issue in some regions in the UK. We particularly support the whole-system approach to work with all expected option providers, including transmission and distribution network owners, and suppliers of reactive power services.

The second change is the introduction of probabilistic modelling to take into account increasing volatility in system flows to identify transmission requirements across the year rather than only at winter peak. We welcome the NGESO keeping its network planning approach under review given the significant changes occurring in the energy landscape.

[1] The submission of the NOA methodologies is a requirement under standard licence condition C27 of the NGESO electricity transmission licence.
[2] The terms 'Ofgem', 'the Authority', 'we' and 'us' are used interchangeably in this document.

More generally, we note that the NGESO continues to rely on the Least Worst Regret approach as the basis for making investment recommendations on reinforcement options in the NOA methodology. As discussed at some face-to-face meetings and NOA related calls over the past year, we encourage that the NGESO keep under review the appropriateness of the analytical framework for assessing whether reinforcement options are economic and efficient. This should, amongst other things, take into account any updates in the development of the Future Energy Scenarios, including if any weights or probabilities have been assigned to relevant scenarios or driving variables. In future NOA methodologies, we consider there would be benefit from the NGESO diversifying its decision-making framework, in order to help ensure that its recommendations are in the interests of consumers.

In the 2020 NOA methodology, we request that the NGESO amend the text under the heading 'Offshore Wider Works – Non Developer Associated process'. We suggest that the detail about the potential regulatory models is removed. In our view, there are many different possible options, depending on the nature of the assets, and therefore the NOA methodology should not inadvertently limit these. We have included some suggested textual amendments in the Annex to this letter.

*Chapter on the NOA for Interconnectors*

Stakeholder feedback provided by the NGESO indicates that the NOA IC continues to be a valuable product. In particular we note positive feedback in response to introduction of a range for the optimal level of interconnection based upon the FES in last year's NOA IC. As such Ofgem welcome the continued use of this approach in the NOA IC 2019/2020 methodology.

We note that the NGESO has revised the method used for setting the interconnector baseline level, to ensure that the baseline is not inadvertently perceived to be favouring specific projects, as suggested by some stakeholder feedback. Whilst we agree that the proposed solution for setting the baseline goes some way towards responding to stakeholder feedback in this regard, we suggest that it would be beneficial to wider stakeholders for this to be explained further, in both the interconnector baseline level methodology and NOA IC report. In addition we suggest that stakeholders would benefit from the inclusion of an explanation of how this baseline methodology is consistent with, as appropriate, the requirements for Projects of Common Interest (PCIs) to be listed on national development plans. Furthermore, whilst acknowledging that stakeholder engagement on the baseline methodology is ongoing, we expect that the finalised detailed methodology for the setting of the baseline is published alongside the NOA IC methodology and that Ofgem are updated as stakeholder engagement on this topic continues.

The NGESO proposes that an analysis of the impact of interconnectors on system operability will no longer be included in the NOA IC; instead the NOA IC will be a signpost to other system operability work being undertaken within the System Operability Framework. This is based upon mixed stakeholder feedback regarding the value and scope of this work, and that additional value may be derived through the consideration of a wider range of factors that might influence system operability in the future. We note that the inclusion of system operability analysis was at the request to Ofgem in our 2017 NOA methodology approval letter; we continue to consider this analysis as important in meeting the objectives of the NOA IC. As such we require that, as a minimum, the breadth and

depth of the analysis performed this year is maintained; that the new location of this analysis is clearly signposted; and that, where possible, meaningful conclusions of this analysis are highlighted in the NOA IC.

*Approval*

Overall, we consider that the 2019 NOA methodology meets the requirements of C27. Therefore, we are approving the NOA methodology for the 2019/20 NOA report.

If you have any questions in relation to this letter please contact Anna Kulhavy (Anna.Kulhavy@ofgem.gov.uk) or Andrew Bullimore (Andrew.Bullimore@ofgem.gov.uk ).

Yours sincerely,

**Min Zhu**
**Deputy Director, RIIO Transmission**

**Annex – Suggested text amendments**

## Offshore Wider Works – Non Developer Associated overview

5.21 Current offshore transmission assets have been developed as standalone connections to shore known as radial connections. However, the Round 3 offshore wind projects are larger, more complex and at a greater distance from shore than those that have been developed so far. As a result there is likely to be the potential for efficiencies from greater coordination and integration of offshore transmission infrastructure. This could include coordination between offshore connections, and coordination of the strategic development of the wider network through offshore reinforcement projects.

5.22 Existing offshore transmission assets are designed as a radial links to allow the transfer of the power from the offshore generator to the onshore network, and are therefore the offshore asset rating is equal to the size of the wind farm. The Non Developer Associated Offshore Wider Works is investment that would support reinforcement of the wider transmission network, but where developers are unwilling or unable to take forward the offshore wider works. An Offshore Wider Works Non Developer associated Needs Case is in many cases a substitute for onshore wider works, and therefore is some way very similar to onshore wider works investment.

5.23 The regulatory route for Offshore Wider Works to be taken forward depends on the nature of the works to be carried out but could involve an OFTO build tender[3] run by Ofgem to identify an OFTO responsible for taking forward the works. Any development of a Needs Case for Offshore Wider Works should include discussion with Ofgem on the proposed nature of the works and the regulatory route for progressing those works. ~~Currently there is no clear route for Offshore Wider Works to be taken forward where works are not being undertaken by a developer. In the last consultation in 2014, Ofgem set out their lead option: for onshore Transmission Owners (TOs) to undertake preliminary works[26] for Non Developer Associated Offshore Wider Works, followed by a late OFTO build tender to identify an OFTO to construct, operate and own the transmission assets.~~

~~5.24 As a result of the consultation responses, Ofgem also considered other potential models for Non Developer Associated Offshore Wider Works.~~

~~5.25 The potential future models for Non Developer Associated Offshore Wider Works are the following:~~

~~a. **Split OFTO Build**: an initial tender to determine a third party to undertake the preliminary works, followed by a late OFTO build tender to determine the party who will construct and own the assets~~

~~b. **Early OFTO Build:** an early OFTO build tender to determine the party with responsibility for preliminary works, construction and ongoing operation of the assets~~

~~c. **TO Initiated Late OFTO Build:** enabling TOs to undertake preliminary works ahead of a late OFTO build tender to determine the party who will construct, own and operate the assets.~~

## Offshore Wider Works – Non Developer Associated process

5.26 The coordination of offshore transmission assets could reduce the costs of the onshore system reinforcement requirements and potentially reduce the costs for the end consumers.

5.27 A Non Developer Associated wider network benefit investment for Offshore Wider Works supports coordination of the development of offshore transmission assets and wider GB transmission network reinforcement. Offshore Wider Works Non Developer associated is not limited to a specific connection offer and is the case where offshore generators are unwilling or unable to take forward the offshore wider works.

[3] https://www.ofgem.gov.uk/publications-and-updates/epc-contract-principles-ofto-build-tenders

5.28 The following text describe the steps of the ESO process for the Offshore Wider Works Non Developer Associated Needs Case.

5.29 Step 1: Identification of system need. The need for Non Developer Associated Offshore Wider Works will be identified by the ESO and the relevant TO. The system need for the Offshore Wider Works can be identified in the following ways:

a. The ESO assesses the system need through the annual Electricity Ten Year Statement (ETYS) process, which subsequently informs the NOA Report.

b. The ESO and TOs regularly discuss and review network capacity issues and the need for network reinforcement in a particular TO's area at Joint Planning Committee (JPC) meetings. Based on that information a TO will consider Offshore Wider Options as an option to reinforce the network.

5.30 Step 2: ESO and relevant TO identify the Offshore Wider Works Options

a. In collaboration with the relevant TO, the ESO develops the Offshore Wider Works options.

b. In developing Offshore Wider Works, the ESO will take into account two major transmission system design criteria: network capacity availability of local boundary and shortfall of the wider system boundaries.

c. According to Chapter 2 of the NETS SQSS – Generation Connection design, the transmission system is designed to accommodate 100% of the transmission entry capacity at the connection point within a local boundary (e.g. for 1GW wind farm connection, the onshore system is designed to accommodate the complete 1GW generation and the offshore assets are sized to provide this full transmission entry capacity.)

d. In planning the Main Interconnected Transmission System (MITS) however, different scaling factors are applied to different types of generating. In the case of wind, this implies that the assets are not assumed to be 100% utilised by the wind generated. Taking into account all these scaling factors, the offshore infrastructure is allowing some spare capacity in the assets. It is this 'spare' capacity that provides the opportunity for offshore wider works to be utilised as one of the options to provide boundary capability.

e. In providing the Offshore Wider Works design it is crucial the ESO and affected TO work together and agree on the generation background, scenarios, and sensitivities which will be used as a basis for the Offshore Wider Works designs. In this stage, the ESO will inform Ofgem on the agreed background and scenario which will form the basis for the Offshore Wider Works designs.

f. The benefits of the Offshore Wider Works will be also assessed by utilising a combination of operational actions to maximise the capability across the boundaries (e.g. actions included QB optimisation and redirection of flows in HVDC links).

g. Once the ESO and the affected TO agree on the Offshore Wider Works options, the agreed Offshore Wider Works options are progressed into the cost-benefit analysis.

5.31 Step 3: Cost-benefit analysis. The ESO will perform the cost-benefit analysis on the agreed Offshore Wider Works options from Step 2. The ESO will lead the cost-benefit analysis. ~~depending on the preferred model for the Non Developer Associated Offshore Wider Works.~~

~~5.32 In the model 1 (Split OFTO build) the preferred Offshore Wider Works options will be obtained in collaboration between TO and 3rd party. The 3rd party will be defined by Ofgem via tendering process.~~

~~5.33 In model 2 (Early OFTO build) the preferred option will be identified in collaboration between the ESO and OFTO. The OFTO will be appointed by Ofgem via tendering process.~~

~~5.34 In the model 3 (Initiated late OFTO build) the preferred option will be determined in collaboration between the ESO and affected/relevant TO.~~

5.35 The Cost-benefit analysis will be performed by the ESO and the objectives and scope of the cost-benefit analysis is explained below:

a. The key economic objectives for cost-benefit analysis for Offshore Wider Works are:

i. Ensure value for money for the consumers by delivering cost effective reinforcements to ensure economically efficient design and operation of the network.

ii. Timely delivery of necessary reinforcement(s) to minimise any cost exposure for consumers to either early investment or delayed implementation.

b. The objectives for Offshore Wider Works cost-benefit analysis are:

i. To be consistent with Licence obligations and National Electricity Transmission System (NETS) Security and Quality of Supply Standards (SQSS), the analysis promotes economic and efficient investment.

ii. To present economic justification for the preferred Offshore Wider Works designs and an explanation of how they compare with the alternative counterfactual case.

iii. To present evidence on expected long-term value for money for consumers considering a range of sensitivities

iv. To present evidence on optimal timing of the preferred reinforcement option.

c. Driven by these objectives the scope of the cost-benefit analysis is:

i. To establish the reference case position in terms of constraint costs forecasts associated with the 'do minimum' network state, across different generation background scenarios.

ii. To model the economic impact, measured as constraint cost savings, for a range of designs, across a range of scenarios.

d. To undertake a cost-benefit analysis by:

i. Appraising the economic case of the options by adopting the Spackman[27] approach and determining respective Net Present Values (NPVs) across the studied generation scenarios and sensitivities.

ii. Establishing worst regrets associated with each design/technology appraised.

iii. Identifying the Least Worst Regret option overall

iv. Assessing the impact of key sensitivities: increase in capital expenditure, and delays in delivery timeframes.

v. Make recommendations for the preferred option i.e. the Least Worst Regret solution, taking into consideration the impact of sensitivities.

~~5.36 Model 1: Split OFTO Build~~

~~a. Under the Split OFTO Build model, the preliminary works would be completed by a third party appointed through an Ofgem-run tender. If there is a Needs Case to proceed with construction, Ofgem would then run a late OFTO build tender. At the completion of the preliminary works, Ofgem would appoint an OFTO licensee to take ownership of the preliminary works and construct, own and operate the transmission assets.~~

~~b. Ofgem would run a first tender to license a third party to undertake the preliminary works and develop the project through to the securing of consents. Ofgem would select the successful bidder on the basis of the price of bids to complete the preliminary works as well as the evidence the bidder provides on its plans, capability and experience.~~

~~c. The successful bidder would complete the preliminary works and produce the relevant outputs needed to run a late OFTO build tender. The party undertaking the preliminary works would be expected to engage stakeholders and coordinate with other relevant parties, including affected developers, TOs and the ESO. It would also be expected to support the eventual late OFTO build tender, undertaking activities such as populating the data room, responding to queries from bidders, and contributing to a smooth and timely tender process.~~

~~5.37 Model 2: Early OFTO Build~~

~~a. Under this model the OFTO would undertake the design work, consenting, procurement and delivery of the transmission assets work programme, as well as being responsible for the operation, maintenance and decommissioning of the assets. Ofgem would appoint an OFTO through an Ofgem-run tender either before, or during, the early stages of the preliminary works. The successful bidder would be selected~~

based on its plans, capabilities and relevant experience, as well as its proposed fixed and indicative costs.

b. The early OFTO build tender would be held on the basis of a high-level specification for the transmission assets, including associated preliminary works.

c. The OFTO would complete all preliminary works associated with the assets, including securing consents. As part of these works, the OFTO would work with the ESO and relevant TOs to ensure that the assets it would be developing would form part of a coherent network design that meets both the high level specification and network requirements.

d. At the invitation to tender (ITT) stage, bidders would be likely to bid their desired Tender Revenue Stream (TRS) based on a combination of fixed and indicative costs, with indicative costs possibly subject to a capped contingency or a sharing mechanism. The specifics of the bid requirement would be defined in the ITT document for each tender. Ofgem also envisage that the OFTO's revenue would be linked to the completion of key deliverables and outputs.

e. As the OFTO approached the completion of the preliminary works and ahead of construction, Ofgem would assess the Needs Case for the investment in more detail to determine whether proceeding to construction would be in the interests of consumers. If so, Ofgem would then engage with the OFTO to finalise its TRS to construct, own and operate the assets. As part of this process Ofgem would seek to fix the terms within the OFTO's licence (such as its TRS) which would have been set on an indicative basis during the ITT and licence award stage.

### 5.38 Model 3: Initiated OFTO Build

a. In the December 2012 consultation, Ofgem set out an option where onshore TOs could submit proposals for funding to undertake the preliminary works for Non Developer Associated Offshore Wider Works, followed by a late OFTO build tender to identify an OFTO to construct, own and operate the assets.

b. Ofgem stated that the TO would work with the ESO to identify the Offshore Wider Works opportunity and develop a corresponding Needs Case. There is the possibility that such a route would use a mechanism in the onshore TO licences (which would need to be introduced complementary to the onshore price control processes) to allow the TO to recover its cost of preliminary works for a project should Ofgem deem the works to be in the interests of consumers.

c. The TO would complete the preliminary works and produce the outputs needed to run a late OFTO build tender. The TO would be expected to engage stakeholders and coordinate with other relevant parties, including affected developers and the ESO. It would also be expected to support the subsequent late OFTO build tender if it goes ahead, undertaking activities such as populating the data room, responding to queries from bidders, and contributing to a smooth and timely tender process. The late OFTO build tender would be similar to the approach set out in our May 2012 consultation on Developer Associated late OFTO build, with adaptations if necessary to reflect that the preliminary works were undertaken by a TO rather than a developer.

[Diagram on page 67] - delete