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Options Development

Annex covering how options are developed for including in the options assessment process

NESO
National Energy System Operator

3.1. Develop future transmission options

This stage details how NESO in collaboration with the TOs, develop and shortlist options for the options assessment process.

3.1.1 Major national electricity transmission system reinforcements

1. Standard Licence Condition C13 refers to 'Major National Electricity System Reinforcements'. For this methodology, the definition, which has been agreed after consultation with the onshore TOs and the Ofgem is:
    - Major National Electricity Transmission System Reinforcements are defined by NESO to consist of a 'project or projects in development to deliver additional boundary capacity or alternative system benefits as identified in the Electricity Ten Year Statement or equivalent document.'

3.1.2 Eligibility criteria for projects for inclusion or exclusion

1. The tCSNP2 Refresh report presents projects as options to reinforce the wider network that are defined by Major National Electricity System Reinforcements (see definition above).
2. NESO provides a summary justification for any projects that are excluded from detailed analysis.
3. Once a Medium Sized Investment Project (MSIP), Large Onshore Transmission Investment (LOTI) or Strategic Wider Work (SWW) needs case has been approved by Ofgem, the option is excluded from the options analysis. The report still refers to this work, but it is included in the baseline. This is due to it being managed through the separate MSIP, LOTI or SWW process. Ofgem have agreed the approach of excluding options where they have already agreed the LOTI or SWW Needs Case.
4. The tCSNP2 refresh will be focusing on reassessing Beyond 2030 onshore and subsea links reinforcements factoring updated maturity of those proposals. The assessment will be widened to variations and alternatives to support optioneering. NESO will determine which projects will be reassessed and which ones will be excluded from the assessment, thus not changing their recommendation from the Beyond 2030 report. Following approval from Ofgem these projects will be considered part of the base network.
5. All options with an EISD from 2030 onwards will be reassessed unless they are part of the Acceleration of Strategic Transmission Investment (ASTI) framework. If a project is within the ASTI framework, NESO will review on a project-by-project basis to determine if the option must be reassessed or excluded from this analysis.
6. Projects from tCSNP2 Refresh that have the potential to enter the delivery pipeline ahead of the first CSNP, is that they are not reassessed, unless their scopes materially change. Ofgem's decision on the proposed regulatory funding and approval framework for onshore on tCSNP2 projects set out scope changes that would necessitate a re-evaluation. The

future CSNP Methodology will also define what constitutes material change for reinforcements in the delivery pipeline.

3.1.3. Design Requirements

1. Our analysis now considers the design requirements for options which define the steps to reach maturity level 3 *Design development/consenting* and that are summarised below. We will reassess options recommended in the Beyond 2030 (tCSNP2) report that now have higher level of maturity which in turn reflects more certainty in cost, timescales and boundary capability. Ofgem included guidance on this maturity level under *Price Control Deliverable* in their decision on tCSNP2 funding published in December 2024.
2. These options, unless already granted delivery track status, would be reassessed and recommended into a "delivery track" to be funded as per the regulatory framework determined by Ofgem once they meet the criteria listed below:
    - Options that have an estimated cost greater than £60m
    - Options that received a **"Proceed"** or **"Hold"** signal, or is an HNDFUE enabling work
    - Options that have reached a NESO maturity rating of 2 (Strategic optioneering)
3. For options that meet the first two criteria stated above but have a NESO maturity of level 1 (Scoping) or level 2 (Strategic optioneering), a "development track" regulatory framework funding would be provided by Ofgem to develop these projects to NESO maturity level 3. Further details are in the System Requirements annex under *Transmission Solution Factors*.
4. To receive funding for each option within the development track, the TOs are to demonstrate the following for each option to reach maturity level 3 (Design/development and consenting):
    - Identification of electrical solution(s) e.g. extend or upgrade substation A and B and install new circuit or reconductor existing circuit from A – B.
    - Indicative high-level substation plans including layout, single line diagrams reflecting site characteristics, connections to existing assets, substation extension requirements.
    - Assessment of spatial characteristics including environmental limitations and potential community impacts.
    - Development of a single line electrical schematic showing the proposed solution.
    - High-level specification of the required asset ratings and electrical parameters to meet network needs.
    - High-level construction programme including acceleration measures and their effectiveness.
    - Updated estimations of project costs.
5. The final decision on funding options lies with Ofgem.

3.1.4. Options development

1. All the high-level transmission reinforcement options which may provide additional capability across a system boundary requiring reinforcement (using "economy and security criteria") are identified, including a review of any options considered in previous years.
2. There might be variations in reinforcements or different approaches in delivering them, for instance between different OHL routes where very different timescales and costs are provided, due to planning and consents. The TOs provide associated outages requirements with these variations or different approaches that reflect their different needs.
3. In response to the data on boundary capabilities and requirements, TOs identify and develop multiple credible options that deliver the required boundary capabilities. NESO produces and circulates the SRF Part A (Appendix C/ Figure C1) to the TOs and publishes them on the NESO website for non-TO developers. In response to Part A, TOs then provide high level details of credible reinforcement options that are expected to satisfy the requirements. Appendix C of this document provides detailed information about the SRF template. The SRF is split into six parts with a guideline on when the TO is required to complete and return each part.
4. NESO can suggest concepts to the TOs to create new options to achieve the stated boundary requirements.
5. Non-TO developers may also propose options for assessment through the non-TO developers' process. Further detail on this can be found in the non-TO developers' section of *Annex 8*.
6. As part of the process to identify future transmission options, NESO will develop alternative options in collaboration with the relevant TO (and the relevant affected parties if applicable). NESO will provide information about network benefit of proposed alternative options and identify regions that might benefit from alternative options. Appendix B/ Table B1 provides examples of alternative options. The TOs can shadow the analysis performed by NESO in their relevant networks. NESO and TOs will agree a detailed assessment methodology appropriate to each option. To facilitate the development of these options, the TOs are expected to provide network information such as limiting trips and components, existing communication and control assets, and information on feasibility of alternative running arrangements.
7. As options develop, their level of detail and design confidence tends to increase. In the early stages, alternative options developed by NESO will be high-level based on the best available information and will not assume availability of market data. The assumptions for each option will be agreed with the relevant TO while developing the option. The assumptions regarding EISD, required infrastructure, cost and effectiveness will vary depending on the studied region. Similarly, 'build' and 'reduced-build' options at a very early development stage might lack detail due to uncertainty in detailed project design such as land and consents requirements.
8. If the alternative option proves beneficial in the cost-benefit analysis, NESO will investigate the market to further develop the options. NESO will use its existing Network Services Procurement projects or establish new ones, if necessary, to perform more detailed analysis

to deliver these options. NESO will share details of the technical and economic assessment approach with TOs, DNOs, and non-TO developers as we develop the Network Services Procurement projects. The TOs, DNOs, and non-TO developers will collaborate with NESO to undertake technical analysis of relevant solutions/options to confirm their effectiveness as well as to determine any works required on the TO/DNO network to facilitate these solutions. The TOs and DNOs will also provide NESO with details of associated costs and programme details for TO and DNO works.

9. The TOs return certain draft SRF sections around a month before final versions according to the timeline described in Appendix D that's agreed between NESO and TOs for the year's programme for the ETYS and options analysis. The drafts' timing is to support NESO's verification studies and cost checking process. The SRF sections form the key inputs to the cost-benefit analysis process.
10. Where an option affects an adjacent TO, the TOs and NESO coordinate their views on the reinforcement options and produce an agreed set of options by an agreed point in the year's programme. NESO uses the agreed set of options in its economic analysis and might use the options in its verification studies. Where an option affects more than one TO and the TOs do not agree, NESO decides which options it assesses.
11. Once the TOs have returned the SRF Parts A to E, NESO reviews the data and understands the costs by discussing them with the TOs. Through engagement, NESO presents the data including for option variations and different delivery approaches that it plans to use in the economic studies.
12. NESO and TOs agree the combinations of options that NESO will use in the cost-benefit analysis.
13. A non-exhaustive list of potential transmission solutions is presented in Appendix B/ Table B1. A wide range of options is encouraged including, where relevant, any innovative solutions and options suggested by non-TO developers.
14. It is intended that the range of options identified has some breadth and includes both small-scale reinforcements with short lead-times and larger-scale alternative reinforcements which are likely to have longer lead-times. NESO applies a sense check in conjunction with the TOs and builds an understanding of the options and their practicalities. In this way, NESO narrows down the options whilst allowing assessment of the most beneficial solution for consumers. Other than the application of economic tools and techniques, to refine a shortlist of options or identify a potential recommended option, NESO relies on the TO for deliverability, planning and environmental factors.
15. TOs must submit the equipment outages required to deliver each reinforcement option and variations/different delivery approaches in the SRF. The information required per option is:
    a. the circuit or apparatus that needs to be on an outage and the required duration of the outages (in weeks) in each calendar year if the option is to be delivered on its EISD;
    b. the number of distinct calendar years that the outage works take place in;
    c. and clashes with other options.

The schemes will be assessed initially based on the outage schedule provided by the TOs. However, there will be a further optimisation of outage dates and EISD to ensure economic value.

16. When developing the outage requirements TOs must consider the results of the previous options assessment report. The outage requirements of all the options need to be considered in a coordinated way such that the optimal years and the recommendations for the options that were found to be optimal in the previous options assessment can be adhered to if possible.

3.1.6. Basis for the cost estimate provided for each option

1. The forecast cost is a central best view. By an agreed point some weeks before the SRF submissions and included in the year's plan, the TOs and NESO agree each year the cost basis to be used for the options analysis. The information that will have to be agreed includes but is not limited to:
    - price base, that is the financial year of the prices and should be current year prices.
    - annual expenditure profile reflecting the options' earliest in service dates.
    - delay costs.
    - the TO's Weighted Average Cost of Capital (WACC).

3.1.7. Checks of the costs that the TOs submit

1. NESO reviews the costs that the TOs submit via the SRF for each of their options and checks if they are reasonable. This is to ensure high quality data goes into the options assessment process. The data is also used for assessing their eligibility for competition. Consenting costs are submitted through the same process but are made distinct from the construction costs.
2. NESO checks the costs that the TOs submit against a range of data available. For similar plant and equipment, NESO also uses knowledge gained from its own research using public resources. If any costs are outside of the range, NESO will investigate it by asking more detailed information from the TO. If following discussions, NESO still believes that the costs are outside of the expected range and will unduly affect the economic analysis, NESO can omit the option from the economic analysis.
3. The costs check process NESO follows is described in *Data QA Checks* annex.

3.1.8. NESO assessment of options' outage requirements

If the following criteria are met, then the process described below will be used for receiving detailed outage requirement data from the TOs and for identifying the resulting delivery interactions and restrictions. In addition, NESO analyses the different outages requirements as part of establishing the optimal outcome when outages affect the choice of variations or different delivery approaches to capital schemes; these will be managed as sensitivities.

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a) there is scope for the economic analysis to consider the impact of outages in the optimal years of the reinforcements and tCSNP2 Refresh recommendations.
b) the detailed outage requirements of the assessed options (or a group of options) can be determined from the outcome of economic analysis.

1. NESO access planning assessment aims to identify the interactions that exist between the outage requirements of options and other scheduled works or between the requirements of different options. The assessment considers the options' outage requirements submitted in SRF Part C together with the most recent long-term outage plan submitted by the TOs to NESO Network Access Planning team. It takes place after the Final SRF Part C submission.
2. In more detail, the assessment will identify the interactions:
   a) between outages required for the delivery of customer connections projects, asset maintenance or other works, and;
   b) between outages required for the delivery of the options.
3. The assessment will thus produce two sets of restrictions for each option:
   a) available years and;
   b) option to option outage conflicts.

   The first term aims to capture the interaction between each option, and the works specified in paragraph 2a. The second aims to capture interactions between the different options.
4. The default position during the assessment is that customer connection works take priority ahead of options works and that option works take priority ahead of asset maintenance or other works.
5. NESO shares the output of the initial analysis with the TOs. The shared output is the identified interactions (paragraph 2) and the resulting restrictions (paragraph 3).
6. TOs must review the identified interactions and the resulting restrictions and raise a query for any request for amends within two weeks. A separate query should be raised by the TO for each considered option.
7. TOs must include in each query the justification for the requested amend. The justification can include any of the following but not limited to why the TO believes that the identified interactions should be amended or why the identified interactions could be effectively resolved by the time construction for the option begins. TOs can also include revised outage requirements in their query.
8. If no query is received for an option, the output of NESO access planning analysis for that option will be used in the CBA.
9. NESO will examine each query separately and consider any amends to the identified interactions based on the data or justification provided by the TO. If applicable, NESO will update the resulting restrictions for the considered options.

10. Following any TO query and the response from NESO no further change in outage requirements should be considered for the current options assessment cycle.
11. NESO will respond to all queries within two weeks of the date that the last TO query was received.