Open Networks
Workstream 1: Product 1
2018

Investment Planning Processes
Roadmap to 2020 and beyond

10 December 2018

Energy Networks Association
Document Ref:
## Document Control

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<th>Issue Date</th>
<th>Author</th>
<th>Comments</th>
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Executive Summary

The Network Options Assessment (NOA) process aims to ensure co-ordinated, economic and efficient development of the National Electricity Transmission System (NETS). Currently its scope is limited to bulk power transfer, moving MWs across system boundaries, with assessment of requirements at winter peak, which are then scaled to represent other year-round conditions. Planning for managing winter peak used to ensure a year-round compliant system, however with the changes in energy mix we are seeing other challenging system needs at points away from winter peak, such as high voltage issues at summer minimum.

Over the last two years through the Open Networks project we have looked to understand the shortfalls in the existing distribution and transmission interfaces/processes. The work began back in 2017 with compiling an understanding of what the current processes deliver. A gap analysis was subsequently undertaken with respect to the evolving nature of the electricity system and the transition that distribution network operator (DNOs) are taking towards the more active role of distribution system operators (DSOs). The outputs from this formed a number of the products being developed under Workstream 1 in 2018 and informed the work on the approach to whole system investment planning in the short term (WS1 Product 3 2017).

<table>
<thead>
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<th>Year</th>
<th>Tasks</th>
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| 2017  | • Map T & D Investment Processes  
      | • Gap Analysis  
      | • Develop approach to whole system planning in the short term |
| 2018  | • Develop case studies that consider DNO network options in a Regional NOA process  
      | • Deliver detail processes and interface for the Regional NOA process  
      | • Create a methodology for a CBA that considers transmission and distribution options |
| 2019  | • Continue to evolve the methodology to include opportunities for market based options  
      | • Agree funding mechanisms and propose future options  
      | • Develop new case studies and methodologies to test different system needs  
      | • Embed the new methodology into NOA 19/20 |
| RIIO-2 | • Propose different options to further enhance whole system planning  
      | • Consider 'whole energy system' in development of longer term models |
1 Introduction

This paper provides a summary of what has been achieved to date in developing and testing a whole system approach to investment planning and endeavours to provide a view to how it’s proposed to continue to evolve the methodology over time. To ensure that processes can be tested and refined in a controlled manner the Regional NOA methodology will continue to evolve through a staged approach. This will also have the added benefit of ensuring each step adds value and can be adapted as other industry initiatives deliver their outputs.

This roadmap has been split into three parts:

Part One - a summary of 2018

Part Two - the plan for 2019

Part Three - looking towards RIIO-2 and beyond

2 Part One: 2018

2.1 The Scope

- Assess regional requirements and identify need for case studies
- Identify and agree case studies
- Develop framework for approach to case studies
- Develop tools and processes required to perform a Regional NOA
- Establish data requirements and exchange mechanisms
- Create common network models and exchange mechanisms
- Identify distribution options to tackle transmission issues identified via case studies and submit for assessment
- Perform CBA to assess distribution options against other options, to derive ‘least worst regrets’ recommendation
- Identify business change requirements and conduct impact assessment
- Identify regulatory/commercial impacts. Propose code modifications

2.2 The Model

The diagram below is indicative of the methodology proposed to better facilitate whole system planning in the short term. Its aim was to allow distribution solutions to be considered alongside transmission options to resolve a transmission constraint. For clarity, this model assume the DNO transitions to a DSO and the activities relating to the SO functions are clearly demarcated.

2.3 The Case Studies

Following consideration of a wide range of potential case studies, it was decided to focus on the high voltage issues in the Pennine region to develop a regional NOA approach, as it was deemed that these would provide sufficient outputs within the time constraints of this product. The case studies would require involvement from both ENWL and NPg and would build on the available learnings coming from the Regional Development Programmes conducted with UKPN and WPD. This would include testing, where possible, the processes and methodologies developed under the RDPs.
2.4 The Approach

The flowchart below is indicative of the process followed for the case studies (for completeness the reference to considering market based solutions has been left in, albeit not tested as part of these initial case studies).
2.5 The Learning

Below is a brief summary of some of the key points from the report.

<table>
<thead>
<tr>
<th>Business impact</th>
<th>Resource requirements vary depending on scope and will be hard to predict on an enduring basis (i.e. how often will whole system case studies be).</th>
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<tr>
<td>Engagement</td>
<td>The way in which needs are communicated will need to be tailored to facilitate DNO or other third party entrants being able to interpret requirements and cost accordingly</td>
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<tr>
<td>Data sharing</td>
<td>A process for sharing information between TO and DNO would be of benefit to maximise collaboration and encourage efficient whole system solutions. Access to transmission network models would enhance DNOs ability to identify more effective and/or efficient options</td>
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<tr>
<td>Cost</td>
<td>There is considerable uncertainty relating to what should be included in the DNO solution cost to allow for risk, O&amp;M, margin or how funding will be achieved</td>
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2.6 The Recommendations

Below is a summary of the key recommendations from both the RDPs and the High Volts case studies.

- It is recommended that the data requirements of the week 24 and week 42 data submissions are augmented to support the whole system planning process.
- Going forward NGESO and the DNOs need to have much greater visibility of each other’s networks, both existing and future. The process would also benefit from a closer working relationship and earlier engagement between distribution and transmission network operators in specifying the need.
- Requirements need to be communicated in such a manner that there is an indication of where in the region being considered solutions would be beneficial, but not so specific that it limits the options submitted.
- The costing of the DNO options needs to be done in a manner consistent/comparable with the ETO options to facilitate a meaningful CBA. A clear set of rules will need to be defined ahead of any procurement/optioneering exercise.
- Further consideration to elements of the CBA process need to be made in expanding the process to distribution and market solutions. It was also identified that greater transparency of the CBA process will be required moving forward.
- For RIIO2; where possible recognition of whole system needs and the associated resource, including IS/IT infrastructure costs, will need to be identified as part of both the transmission networks and distribution networks business plans.
2.7 The Limitations

There is currently no clear funding route for recommendations of the case study as these were not envisaged as part of the network companies RIIO-1 business plans. There are mechanisms available within the current price control framework to move funds between different network companies, (ESO, DNO and TO), however it is not clear what the best approach is to be fair to consumers, and whether this remains appropriate for the RIIO-2 period. Work is currently underway with network companies to recommend the most appropriate approach for the RIIO-1 and RIIO-2 periods.

Consideration to how the Future Worlds and Whole Energy System work evolves is required to ensure no/least regrets actions are pursued.

2.8 The Outputs

Key Deliverables

- The tools and processes required to perform and implement a Regional NOA assessment (voltage rules)
- A set of key recommendations and next steps to improve and evolve the process
- A range of distribution options to resolve a transmission constraint

Key Improvements

- The new methodology broadens the range of available options when looking to resolve constraints on the transmission network, ultimately reducing costs to consumers
- This is the first step to a more inclusive network assessment process that will include new opportunities for market participants
3 Part Two: 2019

3.1 What we are planning

- Explore and agree the funding routes for a range of distribution and transmission based solutions
- Agree and develop a consistent approach to costing transmission and distribution solutions
- Continue to evolve the CBA process to adequately cater for distribution based solutions; build, non-build and market based
- Market test the outputs from the High Volts case studies (RFI to all market participants)
- Develop new case studies for different system needs to further evolve the Regional NOA
- Identify / submit code change proposals to support the roll out of the Regional NOA
- Incorporate regional voltage methodology into NOA 19/20 methodology and continue to evolve processes for Regional NOA for other system needs

3.2 The Model

The diagram below is an evolution of the previous methodology. Its aim will be to allow distribution solutions to be considered alongside transmission options to resolve a transmission constraint and conversely transmission options to be considered for distribution constraints. It will also allow third parties i.e. market based solutions to provide options into the CBA process.

For clarity, this model assume the DNO transitions to a DSO and the activities relating to the SO functions are clearly demarcated.
3.3 The Case Studies

It is the intention of the group to consider a number of different case studies next year, with a view to selecting two areas where we can fully develop the processes required to establish the evolved model. 2019 will also include re-assessment of the two High Volts case studies from 2018, including market testing against the proposed asset based solutions. Options for the new 2019 case studies will include the following system needs:

- High Volts
- Stability
- Boundary constraint
- Fault level
- Thermal

The selected case studies will aim to test a) where a distribution solution can be used to address a transmission constraint b) where a transmission solutions can be used to address a distribution constraint.

3.4 Enabling funding

Further work is required to enable solutions to be costed equitably and funded appropriately. Work in this area will continue through 2019, both to address the immediate need through RIIO-1, and to address the transitionary period between price controls and a view on options for RIIO-2. Summary of proposed activities:

- RIIO-1: decision and implementation
  - Agreement on the funding routes for a range of distribution and transmission based solutions
  - Implementation of the proposed routes for funding distribution and transmission based solutions
- RIIO-2: options
  - Continue work to further evolve and refine options for RIIO-2 funding mechanisms
- Transition period options
  - This will have dependencies on what is agreed for RIIO-1 and what is being proposed for RIIO-2. An agreed approach will be required to deal with the misalignment of price controls

3.5 Dependencies

Consideration to how the Future Worlds and Whole Energy System work evolves is required to ensure no/least regrets actions are pursued.

Agreement between the network companies and the regulator will be required as to the appropriate mechanisms for funding solutions in RIIO-1, and through the transition period between price controls.
4 Part Three: Roadmap to RIIO-2 and beyond

4.1 Introduction

This section presents our initial thinking on possible future investment planning models. How we progress these will have some level of dependency on the outcomes of other industry initiatives.

The models below look to build on our proposals for 2019. Each of the models has unique characteristics and can be developed consecutively over time or until a point where they deliver no further benefit. We seek stakeholder feedback on the timescales for the development of such models and the end point to which they see most appropriate.

Whilst these models focus on the electricity system, they can be adapted to include options from other energy vectors in the same manner as 3rd parties.

4.2 The Models

For clarity, these models assume the DNO transitions to a DSO and the activities relating to the SO functions are clearly demarcated.

4.2.1 Regional Whole System Optioneering (Networks)

This model builds on the one proposed for 2019 by including collaborative optioneering to drive value from hybrid solutions across the transmission and distribution boundary. This would be a regulated activity with costs and technical requirements/capabilities shared between organisations as required.
4.2.2 Regional Whole System Optioneering (All relevant parties)

This model builds on the previous model bringing 3rd parties into a single optioneering process. This will require careful consideration of how commercially sensitive information will be handled.

4.2.3 Regional Whole System Planning

This model is more akin to a Regional Development Programme (RDP) approach where analysis is done by a multi-disciplinary team on a single shared regional model. Like the previous models this can include 3rd parties into or exclude them from the optioneering process.

4.3 Dependencies

Consideration to how the Future Worlds and Whole Energy System work evolves is required to ensure no/least regrets actions are pursued.
5  Document Feedback

We are keen to get your feedback on the work to date, the proposals for 2019 and the future thinking. Below are a set of questions to support the feedback process.

1. Does the work to date deliver tangible progress?

2. Have we identified the key activities and appropriate next steps in 2019s plan?

3. Are there additional areas that we need to consider, or areas we need to make clearer?

4. Excepting the dependencies and limitations imposed by other work currently underway within the industry, not least the Open Networks Future Worlds work does our thinking for RIIO-2 and beyond seem plausible? If not, what is missing?