

30th June 2021

RIIO-ED2: Technical Panel's view on the technical aspects of Northern Powergrid's Draft Business Plan and next steps

Background and purpose of the Technical Panel ('the Panel')

The Northern Powergrid's (NPG's) RIIO-ED2 business plan is based on an asset management approach and underpinning engineering assumptions, analysis, technical conclusions that are, by their very nature, technical and often complex. Therefore, in order for the business plan to be rigorously tested, challenged and improved, the NPG Board instructed an independent 'Technical Panel' to be established under my chairmanship, as a non-executive member of the Board.

The Panel comprises a group of independent consultants with a wealth of knowledge built from working in both industry and academia. See *Annex 1* for their biographies.

The Panel's function is to scrutinise and challenge the technical aspects of the plan and provide an opinion on the extent to which NPG's plans are:

- *Ambitious*: demonstrate a clear vision of the organisational goals with evidence of an aspiration to stretch the boundaries
- *Robust*: analysis is accurate and conclusions well justified
- *Resilient*: suitable consideration is given to the impact of uncertainty
- *Safe*: suitable consideration is given to public and operational safety and legal compliance
- *Forward looking*: decisions are made with future customers and utilisation in mind
- *Innovative*: evidence exists of the adoption of innovative solutions in business as usual
- *Progressive*: there is a progressive approach to continual improvement in both techniques and technologies

Approach and methodology

The primary focus of the Panel is to review operational cost areas by assessing the logic and robustness of justification, suggesting ways to improve the justification where applicable. This includes testing to ensure the business plan is robust and fit for purpose, confirming also that NPG has taken a suitably balanced approach to managing risks for the company, and current and future consumers.

This includes, but is not limited to, review of:

- The analysis carried out by NPg;
- The choice(s) of modelling methodology employed;
- The inputs to, and outputs from, that analysis; and
- The impact of innovation and data and digitalisation enablers across the plan.

Scope

The Panel has sought to challenge all aspects of the business plan that affect decisions on costs. Aligned to the structure of NPg's business plan this mainly covered the following areas, although some other areas were assessed during the course of our work.

- Decarbonisation (including scenarios and investment, DSO strategy and whole system solutions);
- Environmental Action Plan;
- Engineering Justification Papers/Network Investment Strategy
- Reliability and Availability;
- Asset resilience;
- Climate Resilience;
- Innovation; and
- Data and Digitalisation.

The Panel's review process included document reviews, detailed written feedback and face-to-face / video meetings with NPg staff in order to discuss key issues. During the period from June 2020 to June 2021, the Panel has participated in 35 separate, formal meetings.

In addition to formal meetings, bilateral meetings have also taken place on numerous occasions between individual Panel members and NPg staff with specific expertise and responsibility for given areas of the business plan.

Summary conclusions

- i. The Panel has been satisfied by the nature and content of its interactions with NPg. The technical and subject matter expertise of its staff was evident throughout this process.
- ii. The Panel feels that NPg has responded well to its challenges and probing on various issues and we have made significant progress over the course of the past year. NPg's business plan is a more robust, comprehensive, consistent and closely argued document because of the scrutiny of the Panel and the actions taken by NPg to address the points raised.
- iii. NPg is able to demonstrate a comprehensive understanding of the complex challenges it faces in the biggest area driving change in its plan and also the area with greatest uncertainty – decarbonisation. We feel it has developed a robust and well-justified methodology for its decarbonisation pathway and "best-view" scenario.
- iv. NPg has demonstrated good ambition in driving whole-systems solutions and in minimising costs to customers by seeking efficiencies throughout its network investment strategy.
- v. We were encouraged to see a strong track record of delivering innovation projects with tangible benefits that have been adopted into day-to-day business (such as self-healing cables and silent power vehicles). The Panel challenged NPg to enhance its innovation

programme and delivery model to stimulate more innovation throughout the business as it invests in more digital capabilities.

Decarbonisation:

- The decarbonisation methodology is transparent and well justified. NPg gave the Panel significant access to both its approach to scenario modelling as well as its outputs enabling the Panel to a better understanding of NPg's load related planning processes.
- The Panel challenged NPg with its sensitivity analysis of its decarbonisation scenarios. In responding to this challenge, NPg worked with the Panel to expand the analysis. This interaction resulted in the Panel being satisfied by the level of detail and understanding of the impacts of the various externalities that may affect operations. This analysis demonstrates that the plan is robust and but also suitably flexible to manage the likely future uncertainties as pathways evolve.
- NPg's approach to Whole Systems gives appropriate consideration to cross vector influences with a solid set of initiatives and objectives that are a clear progression from ED1.
- The Distribution System Operation Strategy is critical to the future of the electricity networks and NPg plan to become more active participants in an increasingly dynamic market. The objectives and initiatives are clear with direct linkages with data and digitalisation, which will enable NPg to manage future uncertainty.
- A consistent theme in the discussion of NPg's DSO Strategy has been that it is likely to entail greater uncertainty and therefore risk to NPg. The Panel has acknowledged the potential benefits to NPg and consumers of greater flexibility that could be unlocked from the transition to DSO. However, the Panel has nevertheless prompted NPg to fully take into account the range of uncertainties and risks attendant on this move and to develop mitigating measures to the extent possible.

Environmental Action Plan:

- The Panel reviewed the optioneering carried out as part of the Environmental Action Plan. This work focused heavily toward the management of EHV/132kV fluid filled cables and how best to use the latest techniques to manage the associated environmental risks. The Panel was encouraged by NPg's progressive approach to managing this risk through technology which will enable a reduction in costs without a reduction in ambition.
- On electrical losses the Panel were pleased with the scope of analysis, emphasis on a whole system approach and consideration of the wider carbon benefits to be achieved rather than a narrow focus on network loss reduction. The Panel is satisfied with the work carried out to determine the value to customers through the saving of losses and the extent of analysis undertaken on the decision to adopt amorphous core transformers.
- SF₆ was discussed in both the wider context of net-zero and the business carbon footprint. When considered alongside the Climate Change Committee's (CCC) current stance on SF₆ and its continued use in the electricity industry, NPg is taking a progressive and proportional approach to adopting SF₆ alternatives.
- In relation to Polychlorinated Biphenyls (PCBs), specifically, the Panel raised concerns about risks posed with respect to deliverability considering supply chain capacity as the requirement to remove PCBs falls on all DNOs within the UK and also across Europe. NPg should consider these risks in more detail.

Investment Strategy / Engineering Justification Papers

- A significant focus of the Panel has been to understand and challenge NPg's overarching strategy to investment, how different drivers on investment are assessed and how underlying decisions build towards a coherent approach.
- NPg's investment strategy sets out a very clear intent of a holistic asset management approach which we can see evidenced from both the discussions we had with NPg and within its documentation.
- The Panel worked to improve the quality of the narrative and encouraged NPg to establish explicit links between the supporting data and the investment decision within the EJPs. These improvements as recommended by the Panel will be of significant benefit to NPg.
- The Panel's detailed review of EJPs give a high level of confidence in NPg's optioneering and investment decision making across a range of different methodologies. The Panel's reassurance on the robustness and objectivity of the suite of EJP's has, by extension reinforced confidence in NPg's Network Investment Strategy. The Panel will continue after draft submission, to review the full suite of EJPs with assistance from expert consultants.

Asset Resilience

- The Panel reviewed all of the underlying asset strategies for major asset classes. We had detailed engagement with the Network Asset Risk Metric (NARMs) approach that is used extensively for asset replacement and refurbishment choices.
- The choices around asset sizing and integration with the net-zero objectives are well thought out and seem to offer significant value whilst balancing the inherent uncertainty of future demands on the network.

Climate Resilience

- The NPg team are using the best available data for their climate change analysis. Their work has been done in conjunction with both the Met office and the other DNOs.
- We would encourage NPg to continue to look beyond the electricity network for best practise or failures of resilience to continue to inform the planning.

Reliability

- There has been wide-ranging engagement with NPg on this issue including data-analytics, benchmarking and Worst Served Customers (WSCs).
- The Panel feels that NPg has set stretching reliability and availability (R&A) targets for ED2. Benchmarking with other DNOs clearly strengthens the case for accelerated remote control investment and demonstrates that it is beneficial for consumers.
- The Panel has pushed NPg to adopt new innovations in areas such as pre-fault information and to use this important tool in its asset management approach.
- Regulatory (Ofgem) guidelines push DNOs to look at average performances such as customer interruptions (CIs) and customer minutes lost (CMLs), but the Panel has pushed for a targeted approach for WSCs although it recognises that this may have little or no impact on CIs or CLs.

Innovation

- The Panel is pleased to see new innovation projects, how they fit-in with NPg's overall plans and how learning will be implemented into the business, for example Silent Power, Voltage Optimisation, Auto Design and Micro-resilience. In general, the Panel is comfortable with NPg's overall approach to innovation plans although some questions remain to be answered and clarifications to be provided.

Data and digitalisation

- In general, NPG has done well in connecting its data and digitalisation plans to business imperatives and especially with regard to integrating the voice of stakeholders. This is

crucially important and comes through very clearly in the documents reviewed. The Panel is impressed with the interconnection of different task streams with different plans and their relation expected outcomes. A number of key challenges remain however, and these will be discussed in greater depth with NPg before final submission. In particular, the development of digital networks will continue to be explored.

Next steps

The Panel will continue to provide scrutiny on the technical aspects of NPg's plans through until the company submits its final business plan in December 2021. The scope of our reviews will narrow to focus on the areas of most significance and where the expertise of the Panel can be most additive. These are likely to include:

- Decarbonisation;
- Whole Systems;
- Distribution System Operator (DSO) Strategy;
- Digitalisation; and
- Engineering justifications

We intend to issue an updated opinion letter in December 2021, alongside NPg's final RIIO-ED2 business plan.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'P. Taylor', written in a cursive style.

Professor Phil Taylor
Chair of the ED2 Technical Panel
Pro Vice-Chancellor (Research and Enterprise)