

Northern Powergrid
Customer
Engagement
Group

ED2 Final Report

January 2022

Contents

About the Customer Engagement Group (CEG) 3

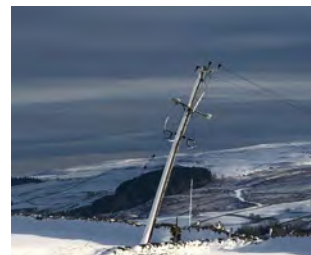
Executive Summary 4

SECTION

1	Establishment of the Customer Engagement Group and ways of working	8
2	An open and transparent approach to business plans	10
3	Delivering value for money services for customers	17
	3.1 Proposals for bespoke outputs	17
	3.2 Meeting the needs of consumers and network users	18
	3.3 Maintaining a safe and resilient network	24
	3.4 Reliability, availability, and resilience	25
	3.5 Delivering an environmentally sustainable network	30
4	A smart, flexible energy system	32
	4.1 Data and Digitalisation	32
	4.2 Transition to Distribution System Operation	34
	4.3 Enabling Whole System Solutions	35
	4.4 Innovation	36
5	Keeping consumer bills low	37
	5.1 Forecasts and scenarios	37
	5.2 Just Transition to Net Zero	38
	5.3 Managing Uncertainty	39
	5.4 Late and early competition	41
6	Business Plan Incentive	42
	6.1 Minimum requirements	42
	6.2 Consumer Value Propositions	42
7	Sections on matters of importance to us that are not included in the body of the report	46
	7.1 Risks to delivery of the plan and its benefits	46
	7.2 Storm Arwen	46
	Annexes	48
	Glossary	63

Impact of Storm Arwen

Northern Powergrid's stakeholder engagement and development of its business plan for 2023-28 were completed before Storm Arwen struck and so its plan does not address the storm's impact and the appropriate response. Therefore, this report reflects that position, while making some early observations about the implications of the storm in [Section 7 \(page 46\)](#).



About the Customer Engagement Group

The CEG's role has been to offer independent scrutiny on the development of Northern Powergrid's 2023-28 business plan.

In line with Ofgem's requirements for enhanced engagement during the 2023-28 price control planning process, the Northern Powergrid CEG was established in 2019. Acting independently of both Northern Powergrid and Ofgem, we provided impartial scrutiny and challenge to the development, and finalisation of, [Northern Powergrid's 2023-28 business plan](#). The plan was submitted to Ofgem on 1 December 2021.



The Customer Engagement Group (CEG) is an independent body established to act on behalf of Northern Powergrid's stakeholders.

Chair Justin McCracken was appointed in July 2019, following an independent recruitment process involving the energy industry regulator Ofgem. He then led the recruitment of the CEG's nine independent experts.

CEG Members

Justin McCracken (chair)
Filippo Gaddo
Jenny Saunders
Simon Pringle

Bindi Patel
Graham Oakes
Mike Kay

Chris Harris
Henri Murison
Patrick Smart

Our input has had significant impact. We raised more than 130 issues with Northern Powergrid and these have led to amendments and adjustments to the plan. As a result, this final business plan better reflects the needs and preferences of stakeholders and contains more extensive provisions for reporting of progress on its customer benefits.

Northern Powergrid has made an ongoing commitment to openness and transparency, both through publishing a suite of annual reports on progress in delivering this plan and maintaining an enduring CEG. We believe this will help stakeholders to hold the company to account. Lessons must also be learned from Storm Arwen ([see section 7, page 46](#)) and responses designed to support customers who are most vulnerable.

Executive Summary

Key stakeholder views

1. A safe and reliable network is a minimum expectation of customers.
2. Most are seeking rapid progress towards decarbonisation but are mindful of the importance of affordability.
3. Priority should be given to improving support for vulnerable customers and those who receive the worst service.

Northern Powergrid's plan reflects the balance of feedback from a wide range of stakeholders.

In preparing its 2023-28 business plan, Northern Powergrid undertook extensive stakeholder engagement, including activities observed by the CEG, which allowed us to highlight areas of good practice and those where improvements could be made. Northern Powergrid has sought to reflect in its plan the balance of stakeholder feedback, and it has been broadly successful in doing so.

However, this is a highly technical business plan, therefore there were significant limitations to the ability of stakeholders and most domestic customer groups to offer informed views. Nonetheless, the plan's strategic priorities and choices that focus on balancing decarbonisation with affordability are in line with the balance of stakeholder input.

The plan sets out to deliver measurable customer benefits.

In our [second interim report \(August 2021\)](#) we recommended greater clarity on key aspects of the plan and challenged the lack of detail on customer benefits and cost allocations. We also requested that Northern Powergrid identify more metrics and targets for benefits to customers. We are pleased with the company's response, both in including an extensive set of deliverables and associated benefits, and in its commitment to reporting publicly on its progress during 2023-28.

Northern Powergrid has taken an open and collaborative approach to load growth scenario development.

Northern Powergrid worked extensively with local and national partners to develop a set of potential scenarios for growth of load on its network as the country decarbonises. Its 'best view' network loading scenario is based on thorough analysis of the available data and appears likely to be robust against all credible pathways. The company must continue to review all relevant information in collaboration with partners and regularly update these scenarios.

More engagement is needed to develop local area energy plans.

This work has highlighted the relatively early stage of Local Area Energy Plan (LAEP) development and significant capability gaps – for wider energy planning, not just engagement with the electricity industry – that currently exist within local authorities and associated bodies at a local level. Consequently, there is a need for extensive future engagement by Northern Powergrid to develop high-quality evidence to inform investment plans for the next price control periods, from 2028 and beyond. We therefore place great importance on the provision in the plan for significant extra resource to work with stakeholders to ensure that local spatial plans and network plans are suitably aligned.

The principle underpinning the approach to investment for decarbonisation is sound.

The overall programme of asset investments in the plan appears to be robust against the risk that network capacity constraints might delay the transition to net zero. We support the plan's principle of using a volume driver linked to electric vehicle and heat pump take-up to accommodate the uncertainty about the rate of electricity demand growth in the coming years.

Balancing the risk of constraining progress to net zero with that of investing too early is key.

In considering how much investment should be included in baseline allowances, the plan considers the risk that, if Northern Powergrid doesn't invest enough in ED2 (Ofgem's name for the price control period the business plan refers to, 2023-28), then it won't be able to scale up network capacity fast enough in ED3 (the following price control period) and beyond to meet demand under all reasonably foreseeable scenarios. It balances this with the risk of incurring costs unnecessarily (or at least sooner than necessary) if demand does not grow as forecast. The CEG cannot undertake a detailed assessment of the level of risk under different scenarios, but the principle of the approach is sound. We believe that regulatory measures can limit the potential for unnecessary increases in bills, so most attention should be paid to avoiding network capability being a constraint on reaching net zero.

Uncertainty mechanisms are a good way to manage the risks associated with recent decisions on access and service upgrades.

Northern Powergrid is proposing that the costs stemming from Ofgem's 'minded to' decisions on its Access and Forward-looking Charges Significant Code Review (Access SCR), if implemented, and those from its recommendation on handling the costs from domestic service upgrades, should both be covered by volume-driven uncertainty mechanisms. In view of the considerable uncertainty regarding both sets of costs we agree that these mechanisms are an appropriate way of dealing with them.

The Network Investment Strategy (NIS) is based on consideration of an appropriate range of options.

The justifications underpinning individual investments in assets in Northern Powergrid's plan, and so in the NIS overall, have progressively been presented to both the CEG and a panel of independent technical experts (the "Technical Panel" – see annex 2) which is chaired by one of the company's non-executive directors. Both we and the Technical Panel challenged the scope and content of these business cases as Northern Powergrid developed them, particularly in ensuring that an appropriately wide range of options was considered. Northern Powergrid responded well and its plan and the Engineering Justification Papers (EJPs) reflect these challenges.

Investments in asset resilience are large and difficult for us to assess.

Asset resilience drives the largest single programme of investments in the plan. We noted in our [second interim report \(August 2021\)](#) that there is a common approach to assessing asset resilience developed jointly between Ofgem and Distribution Network Operators (DNOs) over many years. However, this work is not easy for others to interpret and so we can only express a general opinion on this substantial investment area. Our assessment is that the logic underpinning the plan and its broad content are sound. There may well also be learnings from Storm Arwen that will be used to refine this approach, which could affect Northern Powergrid's investment plans.

The Distribution System Operator (DSO) strategy is well-framed and seems appropriate to the current state of knowledge

The evolution to DSO entails greater uncertainty, and therefore greater risk, compared to other plan areas, but the estimated benefits are consistent with the level of investment. As noted in the body of our report ([in section 4.2, page 34](#)), the plan would be made stronger by defining a more comprehensive suite of metrics and indicators setting out how DSO capability is expected to develop, and what visible benefits it will deliver to Northern Powergrid's customers, year-by-year throughout 2023-28.

DSO governance options need further analysis as DSO plans evolve.

Since publication of the draft business plan in July 2021, there has been much discussion of how Northern Powergrid would maintain an option to separate DSO activities from the rest of a DNO's activities. The company has chosen to keep its DSO activities relatively tightly

integrated with the residual DNO ones, reasonably arguing that this will optimise operational efficiency. The argument would be stronger if the plan set out a more thorough analysis of alternative options.

Reliance on flexibility carries risk

A flexibility-first approach plays a large part in the final plan. Northern Powergrid's assumptions about flexibility have significant risks, given:

- its limited experience in flexibility contracting; and
- its reliance on suppliers incentivising consumers for price-driven flexibility (something that is largely outside the company's control).

Northern Powergrid now has a sound basis for its Data and Digitalisation plan.

Data and Digitalisation is a critical enabler for the overall business plan. Northern Powergrid has made significant progress in planning improvements in this area over the past two years, considering the weakness of its starting position. Its evolving digitalisation strategy and action plan should provide a sound basis for completion of a detailed and granular plan for 2023-28. Ofgem has explicitly recognised in its Business Plan Guidance that it expects digitalisation plans to need further elucidation during 2022, so the development of this plan area is not yet complete. But with 15 months until the 2023-28 price control period begins, Northern Powergrid has built a sound basis on which to finalise it. We have had, and expect to continue to have, extensive engagement with Northern Powergrid on its plan for transforming its use of data and digitalisation.

Northern Powergrid classes over 50 per cent of its customers as vulnerable.

Given this high figure, one of the CEG's priorities is to ensure that Northern Powergrid helps fuel-poor households and those that are most vulnerable. The proposals to support vulnerable customers represent a step change increase in this activity and are ambitious and more detailed than before. But further detailed design of each initiative is critical and should be further progressed before the start of the price control period to shape resilient plans that deliver tangible results. This should be done in close cooperation with the existing and new delivery partners that the company wishes to work with.

Northern Powergrid is committed to improving customer service satisfaction scores.

In line with views expressed by its customers, Northern Powergrid has set an ambitious target to increase its customer satisfaction score to 93.5 per cent by the end of ED2. The CEG welcomes this target and the commitment to improvement that lies behind it. Delivering on the plans to increase customer support and assistance during powercuts will be critical.

The plan includes four proposals for Customer Value Propositions (CVPs).

We support the concept and aims of each of the CVPs but have certain reservations about the detail of the proposals – please see the full report ([section 6.2, page 42](#)).

Northern Powergrid is committed to becoming an anchor organisation.

The company is aware of its importance to the communities it serves and the local economy. It now has a stated commitment to be an anchor organisation and to collaborate with others to be a force for good in those communities and help support a just transition to net zero. There are many opportunities for the company to enhance its positive contributions to these communities, including enhanced supply chain management and significantly increasing the diversity of its workforce – which is crucial for the medium-term development of its skills base. The plan includes important commitments in these areas, and we look forward to reporting on progress during 2023-28.

We encouraged Northern Powergrid to be bold in its aspirations for the Environmental Action Plan (EAP) in line with stakeholder feedback.

We are content that the company has set stretching and science based targets while remaining in line with stakeholder feedback. We made several challenges to Northern Powergrid resulting in a more engagement-driven plan with stronger community initiatives and more support for suppliers to improve their environmental performance.

An internal cultural change is critical to delivering the decarbonisation agenda.

Northern Powergrid is part of a much wider energy system undergoing a substantial transformation because of decarbonisation. This has major implications. Successfully navigating this transformation will require a significant shift in the company's culture to become more outward looking, agile, and adaptable, while preserving its traditional strengths of dependability and efficiency. The proposals in the plan include some important steps in that direction, but many more will be needed in the coming years.

Concluding points

The main risks to delivery of this plan stem from:

- the uncertainties over the pace and pathway of decarbonisation in practice;
- the uptake of customer flexibility;
- pressures on supply chains as all network companies increase their rate of investment; and
- Northern Powergrid's ability to develop its organisational and workforce capability to deal effectively with all the associated challenges.

With more than a year to go before this business plan will be implemented, Northern Powergrid is making good progress towards identifying effective mitigations for these uncertainties – but significantly more work is needed in the coming months.

The CEG's overarching view on the 2023-28 plan.

Overall, Northern Powergrid's plan is ambitious and one that:

- reflects the imperatives of avoiding the electricity network becoming a constraint on net zero;
- continues to provide its essential functions to a high standard;
- enables the development of its wider functions in line with identified stakeholder feedback;
- limits the risk of premature expenditure (within the prevailing regulatory and policy environment); and
- needs to continue to be refined in 2022 to meet ongoing customer needs and mitigate risk of delivery issues.

The 2023-28 plan may need be revisited in the light of Storm Arwen, which took place during the week of submission to Ofgem. Lessons must be learned from the impact on Northern Powergrid's customers, and those lessons must be applied to the plan – which may entail revisiting some of the proposals.

The plan is also built on many evolving issues and uncertainties and so needs to be kept under continual review and refinement during ED2 – success in delivering benefits to customers and stakeholders will come from Northern Powergrid's ability to adapt and implement this plan in line with the changing external environment.

Justin McCracken
Chair

1. Establishment of the Customer Engagement Group and ways of working

1.1 Independence

- 1.1.1 The Customer Engagement Group (CEG) was established in 2019 as an Ofgem requirement for all electricity Distribution Network Operators (DNOs) to have a group to scrutinise business plans for the next price control period, which will run from 2023 to 2028.
- 1.1.2 Our role is to provide independent challenge to Northern Powergrid on its 2023-28 plan and provide our views on whether it addresses the needs and preferences of consumers. So that we can act independently, we operate at arm's length of both Northern Powergrid and Ofgem.
- 1.1.3 More details on our recruitment process can be found in [annex 1](#) and our Terms of Reference can be found in [annex 3: Customer Engagement Group Terms of Reference](#).

- Visit our microsite ceg.northernpowergrid.com
- Read our [annex 1: establishment of the CEG and ways of working](#)

1.2 Our discussions

- 1.2.1 We have met regularly since our formation and, despite the introduction of restrictions related to COVID-19 there has been no interruption or delay to our schedule of work.
- 1.2.2 Many of our discussions have involved Northern Powergrid staff presenting their plans and approaches to developing them. We have also had discussions with Ofgem.
- 1.2.3 The effectiveness of our scrutiny depends on our access to information about Northern Powergrid and its activities, and the openness of its staff. This has been timely, open and constructive. We have received full support from both the company and from Ofgem appropriate to our role.
- 1.2.4 We have scrutinised Northern Powergrid's stakeholder engagement work. In total, CEG members have observed more than 100 events covering a diverse range of topics and involving many different types of stakeholder. See [annex 4: Stakeholder engagement events observed by CEG](#).
- 1.2.5 We have also sought and received views from Northern Powergrid's expert panels:
- Social Issues Expert Group (SIEG)
 - Technical Panel ([see annex 2: Technical Panel and remit](#)).

1.3 Issues and challenges

- 1.3.1 One of our key objectives is to challenge Northern Powergrid's business plan. In total we raised 134 issues, many of which were aimed at improving the effectiveness of Northern Powergrid's stakeholder engagement.
- 1.3.2 Northern Powergrid responded positively to the issues we raised and, in many cases, modified its proposals because of our interactions. All of these issues have either been closed or incorporated into the broader challenges that we raised during our scrutiny work.
- 1.3.3 Following Northern Powergrid's major engagement exercise on its developing plan, we raised six formal challenges to its potential proposals: the company has provided detailed responses to all of these. The challenges and the company's responses to them are set out in detail in [our challenge document](#).
- 1.3.4 The issues and challenges raised by us, and our dialogue with the company, have led to many modifications to the propositions in its plan. We believe that this has resulted in a plan that better reflects the needs and preferences of customers and stakeholders.
-



2 An open and transparent approach to business plans

- 2.1 Northern Powergrid recognises that it is a part of a much wider energy system undergoing a substantial transformation required to deliver net zero by 2050, and that this has major implications for the company. The proposals in this plan include some important steps in that direction, but many more will be needed in the coming years.
- 2.2 We welcome the transparent approach that Northern Powergrid has taken throughout the preparation of its plan. By publishing its full draft business plan and most of the annexes, and taking a similar approach with its final plan, Northern Powergrid has enabled stakeholders to make properly informed responses to Ofgem's consultation.
- 2.3 The company has undertaken extensive stakeholder engagement and sought to reflect in its plan the balance of the feedback received. The strategic priorities and choices set out in the draft plan, balancing decarbonisation with affordability, are broadly in line with the balance of stakeholder views.

Track record and business plan commitment

- 2.4 Our focus has been forward-looking and Northern Powergrid's 2015-23 performance is only relevant to our work where it relates to the prospects for 2023-28. Our comments on the company's track record are contained in the relevant sections of this report relating to each plan section.

Giving consumers a stronger voice

- 2.5 Northern Powergrid has undertaken extensive engagement with its stakeholders as part of the process of developing its 2023-28 business plan and has used expert agencies to support its work. The overarching governance and processes in developing the business plan enabled customer views to be heard and there is strong evidence reflected in each section of the plan of how customer and stakeholder needs and preferences have shaped the outputs.
- 2.6 We observed all four stages, or 'waves', of engagement with customers and stakeholders and provided feedback on both the design of engagement activities and the interpretation and use of the feedback received. From initial engagement through open dialogue sessions we heard customers' issues and concerns, and assessed the different levels of knowledge and understanding among customer groups.
- 2.7 Customer preferences and needs were captured and mapped onto key areas of Northern Powergrid's work. This allowed the company to consult on a wide range of options in its Emerging Thinking document published in August 2020, testing how willing customers would be to pay for the costs of investments needed for different levels of service.
- 2.8 It was clear that across the customer base there was strong support for ambitious action across all areas but with particular support for decarbonisation. The proposals presented in the further waves of engagement (designed to refine the plan propositions and test customers' acceptance) reflected the customer voices we heard through observing engagement activities.

- 2.9 Northern Powergrid identified different customer and stakeholder segments, including ‘seldom heard’ and future customers (in addition to the more traditional groupings of vulnerable, domestic, small and medium-sized enterprises (SMEs), and major customers), and we were impressed by both the range of engagement methods and approaches to facilitate engagement with each group. We were similarly impressed with the care taken to ensure the proposals were well communicated and ultimately understood.
- 2.10 The COVID-19 pandemic forced a significant change of approach in stakeholder engagement. There was very little face-to-face engagement from March 2020, apart from via third-party community partners working directly with vulnerable customers. Virtual engagement events were constantly refined following feedback sessions with CEG members and Northern Powergrid business leads. Virtual events were also straightforward for us to observe so this approach increased our opportunities to see at first-hand the company’s approach to engagement. More recently, the company has once again held face-to-face discussions with several third parties, and we have not had the opportunity to observe these.
- 2.11 Northern Powergrid used a number of agencies which undertook trials and tested survey and workshop materials to ensure they would be understood, particularly where there was little prior knowledge of the company or the specific topic. Consultation materials and surveys were then revised in the light of this testing, and after feedback from us on some topics.
- 2.12 Even so, agency staff experienced in engagement sometimes struggled to explain the concepts and propositions they were seeking views on. Subsequent involvement of Northern Powergrid’s business leads in the engagement sessions provided a more authoritative/ technical view when this was needed. This also ensured that the business leads heard directly from stakeholders and customers and sensitised them to customer experiences and concerns.
- 2.13 There were several lessons learned during early engagement that we highlighted in our second [Interim Report \(August 2021\)](#):
- the importance of coordinating the work of all the agencies;
 - the benefit of simplification of issues; and
 - the value of using graphic or visual materials to aid understanding of complex issues.
- Northern Powergrid addressed these lessons by agreeing shared narratives to be used by all its agencies, using Energy Champions from customer panels to challenge jargon and help explain technical issues and by developing short videos for the Business Plan Acceptability Testing (BPAT) exercise.
- 2.14 Northern Powergrid undertook a major consultation on options for the business plan during the second half of 2020. This consultation was based on its document Emerging Thinking, which offered costed options across all output areas with a range of levels of ambition together with estimated bill impacts. Customer preferences identified from this exercise were reflected in the draft plan and further insights were sought, through customer panels, to further develop the propositions.
- 2.15 Differing customer views have been taken seriously. During the early stages of the design of the plan, where there were conflicting views, these were weighted using a new methodology, developed by the company for this purpose. This was developed to help ensure that greater weight was attributed to those views expressed by people with expert or local knowledge and those most affected by the proposal under consideration.
- 2.16 An important part of the company’s engagement work was on developing its future load scenarios, which ultimately led to its best view scenario position in the final plan. The company explored a range of scenarios with stakeholders and worked with the Open Data Institute (ODI) to encourage local authorities and other stakeholders to engage with and inform this process. The different scenarios and their underlying assumptions have been available throughout for public scrutiny. We observed some of Northern Powergrid’s interaction with stakeholders and while no alternative scenarios were developed as a result, there was a recognition and understanding of the consequences of the different pathways to decarbonisation.

- 2.17 Northern Powergrid’s best-view scenario used for the 2023-28 price control period is therefore based on the best available information from a range of stakeholders ([see section 5: keeping consumer bills low](#)).
- 2.18 This area of engagement also demonstrated that, although many local authorities have declared climate change emergencies and have targets to achieve net zero in advance of the national 2050 target, planning at a local level is generally not sufficiently far advanced to provide evidence approaching the quality envisaged in the [Energy Systems Catapult guidance on Local Area Energy Plans \(LAEPs\)](#).
- 2.19 Local authorities will require substantial support during 2023-28 to enable them to develop evidence of suitable quality to inform investment plans beyond 2028. This will need to include expertise on and local knowledge of energy systems, which Northern Powergrid (working with Northern Gas Networks, as it is publicly committed to continue doing) is ideally placed to provide. Following our encouragement, the plan makes provision to build on Northern Powergrid’s current work in this area with a significant capacity increase in 2023-28, which reflects the needs of these important stakeholders.
- 2.20 Northern Powergrid has included summaries, almost all of which accurately and fairly convey the results of its stakeholder engagement within the individual sections of the business plan, and we comment further on those within relevant sections of this report.



Headline observations on stakeholder engagement that Ofgem should be aware of:

- Most stakeholders consulted are seeking rapid progress towards decarbonisation, but are mindful of the importance of affordability.
- Customers and stakeholders have become more concerned about affordability of energy bills following recent wholesale energy price increases. While enabling the pathways to decarbonisation remained a top priority across the customer base throughout the engagement process, the drivers expressed on bill impacts during Wave 4 Business Plan Acceptability Testing focused above all on a safe and resilient network.
- A safe and reliable network is a minimum expectation of customers.
- Customers don't make the distinction between different aspects of service in the way network companies and Ofgem define outputs (e.g. between reliability, availability, and resilience). This was a complication in interpreting feedback despite significant effort on behalf of the company to help customers understand the distinctions in the types of activities undertaken to provide a safe, reliable and resilient network.
- Many aspects of the business plan are inherently difficult for people without specialist expertise to grasp at a sufficiently granular level to give meaningful feedback on their preferences except in general terms. This places a clear limitation on the precision of any steer from engagement on these topics. Examples of this include investment in Asset Resilience and Data and Digitalisation. Northern Powergrid made substantial efforts to overcome this barrier and got progressively better during the consultations at explaining some more complex issues and avoiding the use of jargon. Nevertheless, significant limitations in exploring some issues persisted. We used both our own expertise and that of other expert groups to augment stakeholder feedback by making our own assessment of customers' needs in these highly technical and complex areas.
- Bill impacts also proved to be a complex topic to explore with domestic customers during the optioneering phase of the planning process. It remained difficult for some customers to grasp fully despite extensive work in this area by Northern Powergrid. Although the company focused its consultation on the impact of choices for its business plan, initial testing demonstrated that a substantial minority of those involved had not properly understood the bill impacts of the choices on offer, although this improved following simplified explanations of how costs are recovered. Consequently, the results of the Willingness to Pay exercise have limited value other than to assess the value stakeholders place on different options in general terms. Triangulation of evidence from different sources and exercises was undertaken to provide a more complete picture of customer views.

- 2.21 The approach taken to Business Plan Acceptability Testing (BPAT) was mindful of the difficulties in interpreting financial complexities and regulatory drivers. Northern Powergrid sought to identify whether customers accepted the overall plan and main elements under four key themes of:
- Green Future
 - Safe and Resilient Network
 - Customer Service
 - Communities
- A second outcome of this exercise was to ascertain customer acceptance of bill impacts associated with the plan. Their preferences for a smaller or greater increase or decrease in cost – depending on how quickly decarbonisation might happen and based on two different financial frameworks – were tested.
- 2.22 A survey was conducted via a market research company with a sample of customers that reflected Northern Powergrid’s customer base. A second shorter survey, based on the same material, was carried out with a self-selecting wider group of customers. We were made aware of the details of this following the submission of the final plan. The timing of the surveys fell not only during the start of the winter period when customers were more focused on their energy bills, but also when wholesale price rises had become a major public policy concern. Northern Powergrid tested customers’ acceptance of bill impacts based on both Ofgem’s required financial framework and Northern Powergrid’s favoured framework, which provides the company with a higher return on equity and recovers costs over a shorter period resulting in higher bills in the short-medium term. The range in potential bill impacts was from an increase of £7.27 to a decrease of £4.13.
- 2.23 The combined result of both surveys was 82 per cent acceptance of the final business plan, disregarding bill impacts, compared with the 89 per cent result reported for the draft business plan.
- 2.24 Inclusion of the bill impacts led to lower acceptance rates of the business plan. In the study conducted by the market research company approximately 75 per cent of domestic customers supported the proposals in the plan when Ofgem’s financial assumptions were used. This fell to just 60 per cent when Northern Powergrid’s preferred financial assumptions were tested. Results among commercial and industrial users were approximately 70 per cent under both sets of financial assumptions. In the second study only Northern Powergrid’s financial framework was tested and 68 per cent of customers (all domestic) found the plan overall acceptable. Given that the costs in the plan had not changed significantly from those tested earlier, the change in customer responses illustrates the importance influence of external factors on the responses given to such surveys.
- 2.25 We note that Northern Powergrid reports in its business plan that the overall acceptance score from these two studies was 82 per cent. This is misleading, given that the figures that include bill impacts (an important part of overall acceptance) are significantly lower.
- 2.26 There was no consistent testing methodology across the DNOs, which makes any comparison between the companies very difficult. Some customers will find any increase in costs difficult, and this is reflected in the lower scores from customers in fuel poverty. Only 49 per cent of this group found the highest bill impact (£7.27) acceptable rising to 75 per cent acceptance for a decrease in costs of £4.13. It may be no surprise that customers favour Ofgem’s financial framework. The scores are lower than earlier willingness to pay testing carried out before the energy crisis and in the summer when sensitivity to energy prices was lower for most customers, and COVID-19-related income support was still in place. While there is merit in seeking customer views in this way, it is only one element of engagement and should not be seen as the ultimate factor in assessing whether the plan reflects what stakeholders and customers want and need.
- 2.27 There are opportunities for Northern Powergrid to address the reasons customers gave for not accepting the company’s proposals through their ongoing engagement plans, and we encourage them to do this.

Openness and transparency

- 2.28 Northern Powergrid has established high-level aims that reflect stakeholders' feedback about the importance of enabling fair and open competition, stimulating flexibility, and openness in reporting, all supported by effective governance standards.
- 2.29 Most domestic customers favour a high level of ambition in placing transparency at the heart of the organisation and are interested to see how the company works with its supply chain. For instance, "ensuring > 95 per cent of suppliers meet strict environmental management standards" was seen as a top priority. In the final plan Northern Powergrid confirms its intention to:
- implement a sustainable procurement policy;
 - introduce a responsible procurement charter for its suppliers; and
 - establish a funded programme to help suppliers to meet ISO 14001 standards.
- 2.30 We welcome the emphasis on open energy system data being made available to stakeholders, but note that the date that Northern Powergrid can deliver and the ease with which it can be used will be highly dependent on the underlying data pipelines, which are being developed under its Data and Digitalisation strategy.
- 2.31 In our report on Northern Powergrid's draft business plan we highlighted that in proposals around open data, as in many other areas of the plan, it was committing to several deliverables which did not have specific targets or metrics associated with them. We challenged the company to review its metrics and report on a wider set. The final business plan includes a greater number of metrics and highlights additional anticipated customer benefits. Regular reporting of progress against these deliverables will be important for stakeholders to have confidence in the company's delivery of its plan commitments.
- 2.32 The company has committed to retaining a Customer Engagement Group throughout 2023-28. We will continue to provide independent scrutiny and reports on the delivery of the benefits promised in this plan and oversight of Northern Powergrid's ongoing engagement programme. We look forward to working with both the company and Ofgem to agree suitable arrangements to safeguard our ongoing independence. We intend to publish annual reports on the company's progress towards achieving the commitments in its plan.
- 2.33 The company has also committed to independent audit and open reporting on investment decision processes as part of the Distribution System Operation (DSO) assurance function.

Northern Powergrid's stakeholder engagement plans for 2023-28

- 2.34 We are supportive of the stakeholder engagement strategy and the aims of Northern Powergrid's stakeholder engagement programme for 2023-28. The accompanying stakeholder engagement methodology document demonstrates good practice with clear governance and assurance arrangements.
- 2.35 The strategy now has a strong focus on decarbonisation – the issue highlighted as being most important in the consultation stages of the business plan. This also reflects an early challenge raised by us during a deep-dive session, which stated "Northern Powergrid has not shown sufficient focus and ambition for engagement on the changes that will be needed (or are being planned by stakeholders/customers) to meet the future challenges of the energy transition".
- 2.36 By actively listening to stakeholders and customers Northern Powergrid will increase its understanding of what continues to be important to people in its region and what new priorities are important, enabling it to act upon feedback in a timely way.
- 2.37 This overarching approach and range of proposed activities demonstrate that:
- lessons have been learned during the 2023-28 business plan consultation phase;
 - these provide an opportunity to improve on 2015-23 performance and are being embedded; and
 - good practice is being adopted.

We expect annual reporting and ongoing joint creation of programmes – which is particularly important for services to vulnerable customers that will be promoted and delivered by community and other front-line agencies.

- 2.38 The plan allows a degree of flexibility to explore new and emerging themes and issues with stakeholders through a range of channels and activities. We expect to see the continued involvement of senior business leads in workshops and forums, to continue to hear directly from customers and to feed back how Northern Powergrid has acted to deliver the benefits it committed to provide.
- 2.39 The costs associated with engagement are not insignificant, but they represent a very small percentage of the total costs for 2023-28. Without focused and meaningful stakeholder and customer engagement the company will not be able to deliver its commitments on decarbonisation.
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3 Delivering value for money services for customers

3.1 Proposals for bespoke outputs

3.1.1 11kV network automation

Northern Powergrid is proposing a Price Control Deliverable (PCD) for expenditure in this area. We are uncertain that an input-based incentive is appropriate here. Northern Powergrid's assessment of the numbers and location of automation points is undertaken predominantly for the 11kV (and 20kV) network at a point in time.

The 11kV network is quite dynamic, and simply rolling forward a plan based on numbers over five years might not lead to the most efficient outcome.

Although Northern Powergrid signalled their intent to include this as a price control deliverable, there was no discussion on what an appropriate remuneration mechanism might be.

As the PCD on its own is simply an input-based mechanism, we would have liked to explore how the PCD interacts with the existing IIS mechanism to be convinced that the combination incentivises efficient investment.

3.1.2 ODI-R on DSO strategy delivery report*

Northern Powergrid has proposed 11 ODI-F and six ODI-R measures against its DSO strategy, plus nine annually reported stakeholder submetrics. Together with the suite of metrics developed by Northern Powergrid for monitoring progress on their plan, these provide good coverage across all aspects of the strategy. However, we believe the definition of some measures could be clarified (or at least, we have not seen clear definitions of them), and they would be stronger for monitoring and steering progress if an assessment of how the metrics will develop year-by-year were made.

**Outcome Delivery Incentives (ODIs): reputational (ODI-R) or financial (ODI-F) incentives aimed at driving service improvement*

3.1.3 ODI-R on Vulnerable Customers Delivery Report

Northern Powergrid proposes to publish a Vulnerable Customers Delivery Report each year, setting out its progress on most of the commitments in its plan that are not covered by the reporting requirements of Ofgem's ODI-F on Vulnerability. We welcome this commitment to openness and believe the report will help stakeholders to hold the company accountable for delivering its commitments.

3.1.4 ODI-R on Major Connections delivery report

Northern Powergrid has proposed a single bespoke ODI-R measure for Major Connections. The proposal is an annual report on its performance against its strategy. Northern Powergrid has not proposed the format and content of the report, but we assume that the report will address the content of Northern Powergrid's annex 4.14 to the plan.

In addition, Northern Powergrid is proposing that its customer service performance against escalating targets from 84.3 per cent currently to 90 per cent satisfaction by 2028 will be financially incentivised through a financial output delivery incentive. Coupled with its proposed annual report we believe that this will enable Ofgem and stakeholders to hold Northern Powergrid to account against its commitments.

3.2 Meeting the needs of consumers and network users

Vulnerability strategy

- 3.2.1 A high proportion (over 50 per cent) of Northern Powergrid’s customers at any time meet the company’s criteria to be defined as ‘vulnerable’, and the area served by the company is extensive, and includes a very wide range of types of community. This makes the company’s strategy and plans to support them particularly important at any time but even more so when COVID-19 is imposing constraints on many channels of support and household incomes are under real pressure.
- 3.2.2 Northern Powergrid is proposing a much more ambitious programme of assistance to customers who are vulnerable (for example because of fuel poverty) or who, for a range of reasons, may become more vulnerable during power outages. It will increase its expenditure to support vulnerable customers from £0.8m p.a. to £3.9m p.a., and so it is particularly important to understand the added value this will bring to such customers, and how the company and its delivery partners will identify and support them.
- 3.2.3 Roughly half of the increased expenditure is to provide additional support to a greater number of vulnerable customers during power outages. The company is creating eight new roles to work with communities and individuals during outages. This is also something strongly supported by stakeholders whose preferences were clear: help when it was most needed and to those who most need it. We expect lessons to be learned from the extreme event caused by Storm Arwen (see [section 7](#) of this report) and that the responses to post-event engagement are considered in designing future support to the most vulnerable.
- 3.2.4 The proposals within Northern Powergrid’s vulnerability strategy seek to address and map the principles set by Ofgem and have been benchmarked against initiatives within and outside the sector. Characteristics of the customers the company is targeting have been modelled and customer profiles were developed, alongside mapping of regional characteristics and indicators of vulnerability based on data provided by Experian.¹ We believe that Northern Powergrid should be interrogating and interpreting this data very carefully. The company’s independent Social Issues Expert Group (SIEG) has contributed to the development of the strategy and the design of the output proposals. We note that this group will continue to advise Northern Powergrid on the development of its proposals and is well placed to identify where programmes may need to flex/change in response to new needs.
- 3.2.5 We are aware that Ofgem has convened a working group that is reviewing the methodologies and data being used across the sector to enable benchmarking and a more consistent approach. We welcome this initiative, which would assist in agreeing data to support workable definitions of fuel poverty, eligibility criteria for and the design of programmes, and communicating the support available to customers and their support agencies. It may result in considerable reframing of the proposals presented in Northern Powergrid’s business plan, which we comment on below, but our comments reflect what has been developed to date.
- 3.2.6 No new options have been brought forward since the draft plan was written, but more detail on the initial proposals were tested out with different customer groups and agencies. New delivery partners are being engaged who understand the needs of customers with different types of vulnerabilities. This includes those with transient vulnerabilities, who are more difficult for companies to identify and then manage the duration of their Priority Services Membership (PSM) – (rebranded from Priority Services Register after feedback from customers). We welcome Northern Powergrid’s approach of developing the concept of membership in the renamed Priority Services Membership (previously known as the Priority Services Register), which we believe will encourage customer consent to being registered.

1. Experian is a major business services company specialising in consumer credit information.

- 3.2.7 In our [second interim report \(August 2021\)](#) we highlighted that several the proposals were still at a relatively early stage of definition and asked for greater clarity on:
- how Northern Powergrid would help 5,000 vulnerable customers through the energy transition with examples of the types of initiatives envisaged and how costs would be apportioned;
 - the proposition behind a proposed smartphone app. This required further definition to set out what services would be provided and to whom; and
 - a closer definition of how the proposed new roles of community outreach/vulnerable customer support and community energy advisors would link up.
- 3.2.8 Some members of the customer panels thought that supporting 5,000 customers through the energy transition was very low compared with the potential need, and indeed the likely growth in the number of vulnerable customers due to an aging population, the longer lasting impacts of Covid on household debt and health, and the ongoing issue of high energy prices. Northern Powergrid is however significantly scaling up support to households in fuel poverty from around 6,300 in 2015-23 to 20,000 in 2023-28, with an estimated benefit of £40m to those households.
- 3.2.9 Customers have been generally supportive of Northern Powergrid doing more to help more vulnerable customers but have been surprised at how much help they already offer. We therefore highlighted the importance of better communication of the new services and increase awareness of them. We observed several engagement events where support for the most vulnerable customers and those who receive the worst service was welcomed and this has been reflected in the business plan.
- 3.2.10 Overall the vulnerability strategy now takes Northern Powergrid well beyond its current position. The propositions for the five areas of focus in the strategy illustrate the way in which the needs of vulnerable customers are being addressed. While much more detail has been provided to demonstrate customer benefits and cost allocations, the detailed design of the propositions is critical and something that should be further progressed before the start of the price control period. This should be done in close cooperation with the existing and new delivery partners that the company has identified it wishes to work with.
- 3.2.11 Northern Powergrid informs us that over half of its customer base meets Ofgem's definition of vulnerability. However, currently only 900,000 households (out of a total of 3.9 million) in Northern Powergrid's region are Priority Service Members. In addition 18 per cent of its customer households are in fuel poverty (based on a Low Income High Cost indicator which the government has replaced with a Low Income Low Energy Efficiency indicator, and modelled using data provided by Experian). It compares with 13 per cent nationally. Northern Powergrid has provided further segmentation of vulnerability, which reveals that approximately 2.25 million people living in the area served by the company have high-risk needs as defined by the company based on its assessment of need during power outages. Of those, fewer than one million are currently registered and known to the company. We welcome that the company will seek to recruit 70 per cent of these customers.
- 3.2.12 To increase the targeting of 'most at risk' customers it will be essential for Northern Powergrid to develop clear communication channels and work with a greater number of trusted partners. We have seen evidence that Northern Powergrid is developing relationships and early trials will be commencing in 2022. However, it is important that shared objectives and success criteria are fully developed and agreed.
- 3.2.13 Northern Powergrid is using data from Experian to identify and communicate with households which are, or may become vulnerable. There is a range of available of geographic and personal data, some of which has been modelled, linked to communication channels where permissions have been agreed by the individual. This will enable Northern Powergrid and its partners to proactively identify households with vulnerability attributes. For example Ofgem's needs codes relate to:
- low income;
 - age related;
 - rural location;
 - probability of fuel poverty; and
 - other risk factors.

3.2.14 The fine details are, however, still being developed and much will depend on any final decision by Ofgem on cross industry approaches.

3.2.15 The proposed advice services that will be provided by the company's delivery partners address some of the main issues facing households which are financially vulnerable. The company is enabling access to the range of interventions that will make bills more affordable by offering advice on:

- debt and energy tariffs;
- energy efficiency grants and measures; and
- maximising incomes (particularly navigating the welfare benefits systems).

The approach of using expert third-party delivery agencies is welcome, as is increasing employee awareness across the company with regular vulnerability awareness training.

3.2.16 We highlighted the importance of establishing strong internal links between all the new customer-facing roles to capture and share learnings. Reporting on this should be part of the annual report on the vulnerability strategy. We also note that vulnerability has been reflected in each of the main work streams throughout the business plan.

3.2.17 Around £1.8m in total (£1m development costs and £0.2m p.a. operational costs) is proposed for a new smartphone app aimed at vulnerable customers who are digitally enabled to provide a new communication channel offering a wider range of information services. This is the main cost associated with increasing the numbers in the PSM. The app is also intended to free up additional resources to support those who are digitally excluded and are reliant on calling the company for information.

3.2.18 The app was conceived and has been supported by Northern Powergrid's SIEG and it will be developed in partnership with several agencies and industry experts including energy retail and the banking sector. The company has already consulted with several commercial and customer-facing agencies to understand the likely take-up, and the most appropriate design and functionality. For our fuller comments on the app, [see the Consumer Value Propositions \(CVPs\) section](#).

3.2.19 There are similarities in approach across all the DNO and gas distribution networks (GDNs) when it comes to working with third-party agencies to deliver support to vulnerable customers. There may be some national and regional efficiencies developed through collaborative use-it-or-lose-it initiatives.

3.2.20 We recommend that Ofgem build on the work of the group mentioned above (para 3.2.5) to develop collaborative approaches to data capture and sharing between the companies and frontline agencies to:

- assess whether there could be greater standardisation of delivery in the price control period beginning in 2028;
- seek common standards of service;
- identify any cost inefficiencies;
- align better with government strategy targets for energy efficiency, fuel poverty, and energy affordability;
- and ensure a just transition to net zero.

Customer benefits

3.2.21 The total benefits claimed from delivering the vulnerability strategy are approximately £56m. These are dominated by initiative VN4.1, "Extend our partnership reach to deliver a regionally tailored multifaceted affordability service for 100,000 households in extreme fuel poverty (approximately 25 per cent of those in our region) unlocking £40m of benefits".

3.2.22 We challenged Northern Powergrid to provide evidence that these figures were fully justified and were provided with a breakdown based on actual data from a current partnership with Citizens Advice Newcastle inserted into the Sia Partners social return on investment (SROI) model.

- 3.2.23 We were satisfied that the values presented in the programme were based on actual delivery by Newcastle Citizens Advice in 2015-23 and that assurances given that other agencies across the network region were in place with capacity and capabilities to roll out a similar approach. Nevertheless, we believe that careful tracking and regular reporting of progress towards this target during 2023-28 is vital.
- 3.2.24 The SROI methodology applied to the strategy uses metrics common across the industry. Following challenges by us on the cost savings likely to accrue and consequently the value of switching supplier, the methodology was modified, and the value reduced. We remain concerned that current market conditions make it difficult for us to take a view on whether the assumptions are fit for the 2023-28 period and propose Ofgem take a view on the assumptions included in the model produced by Sia for all the DNOs.

Customer Service

- 3.2.25 Northern Powergrid has historically not been a strong performer in customer service, relative to other DNOs. We heard that systems improvements made since 2015 (new customer relationship management (CRM) software) have led to improved customer satisfaction scores (up to 90.5 per cent in 2020 from 82 per cent at the start of 2015-23). The company has set a more ambitious customer satisfaction target of 93.5 per cent for 2023-28 and has declared an aspiration of becoming a leader in this area.
- 3.2.26 The proposed level of improvement is in line with the views expressed by customers during the consultation on the Emerging Thinking document. Although stretching, we believe that it is achievable using new approaches and systems.
- 3.2.27 Proposals to further improve contact scores rely in part on increasing the number of communication channels and extending assistance during extended power outages. Recent experiences of customers from Storm Arwen suggest this is needed. Even by providing digital options, if outages are prolonged, the value of these decrease if customers are not able to access digital communications ([see the Storm Arwen section](#) for our further comment on its impact on the plan). There was evidence from stakeholder feedback that many would welcome more digital communication channels and self-serve, but we welcome the commitment to continue to serve digitally excluded customers and those who simply prefer to speak to someone.
- 3.2.28 There is also a strong focus in the company's proposals on helping customers to decarbonise. This too is in line with the preferences expressed by customers, who have said they would trust Northern Powergrid to provide impartial advice on low carbon technologies (LCTs) since they are not selling products.
- 3.2.29 We have emphasised the importance of workforce training and company culture in improving outcomes for customers and other stakeholders. Each business plan section highlights how it has taken on board customer and stakeholder views. Without a customer-first approach the business plan delivery will be sub-optimal. This will require lessons from 2023-28 engagement to be firmly embedded across all areas of the business as is pledged for stakeholder engagement and awareness of vulnerability.
- 3.2.30 Services to flexibility providers and other data users need to be better articulated. We did not see any detailed proposals on this and urge Northern Powergrid to increase its interaction with these new stakeholders before the start of 2023-28 to develop a high standard, responsive service with clear codes of practice. We suggest that further work is also undertaken to develop a set of commitments to customer service that Northern Powergrid aspires to as a DSO.

Our Communities

- 3.2.31 Northern Powergrid's work in this area has both business and societal benefits. The company's stakeholder engagement work has demonstrated that customers value this work when it is brought to their attention, but it is not well publicised.
- 3.2.32 Northern Powergrid has committed to recruiting new LAEP advisers to work in collaboration with local authorities and others in the wider energy sector. We welcome this investment, which will promote closer coordination between local spatial planning and national sector-based plans. It has been a key ask by the region's elected bodies who lack resource and expertise to alone develop their plans (to the standards required by Ofgem to support DNO investment) and deliver their climate emergency ambitions.
- 3.2.33 The development of a commitment to become an anchor organisation (with the supporting strategy) is welcomed by us, in terms of its scope, the underpinning leadership and the pace at which it has been evolved. It is anticipated that this commitment will lead to greater levels of external collaboration and a heightened focus on the impact of the company as an employer and investor across the region. Customer benefit is likely to be felt in terms of social impact, workforce resilience and enhanced partnership working on agendas such as vulnerability.
- 3.2.34 The role of community energy advisors mooted in the draft plan has been developed with greater clarity of functions, and links to both internal and external agencies articulated. We have previously expressed concern about the breadth and depth of skills/knowledge required for these advisors including the level of qualifications and experience and their interface with other frontline advisory bodies.
- 3.2.35 Greater thought has now gone in to how the different new advisory roles will interface with others both within the company and within partner organisations. While this is more clearly articulated there is an opportunity during the trial phase to test out appropriate mechanisms and gain stakeholder feedback. Draft job descriptions now articulate the types of skills and knowledge envisaged.
- 3.2.36 Expansion of both the company's educational work (with a focus on deprived communities) and the support to communities where major schemes are taking place are supported by stakeholders. The educational programme encourages the study of the science technology engineering and mathematics subjects the company needs from future employees. It links to workforce diversity by encouraging applications from young people from more disadvantaged backgrounds and other demographics representative of the make-up of the communities served by Northern Powergrid.
- 3.2.37 Using company employees as volunteers to deliver some of the education programmes may be a useful way for the company to ensure its employees are made aware of the issues facing children in deprived areas, but it will be important to ensure that volunteers have the right skills sets to engage positively.

Connections

All connections

- 3.2.38 We have been exploring the connections needs of customers, including larger customers, in some depth. The current proposition for new connections is broadly accepted by us and we are encouraged by the commitment of Northern Powergrid to provide more clarity as to the full customer journey. Certain connection issues may be best addressed on an industry-wide/ Energy Networks Association (ENA) scale.
- 3.2.39 We initially had concerns regarding the balance of focus on current and future customers. We were particularly concerned to ensure sufficient focus on the owners of the potential 1.84m electric vehicles (EVs) that Northern Powergrid reportedly expects to see charging on the grid by 2030, and those installing domestic storage (including EVs in vehicle-to-grid (V2G) mode).¹ There is an understandable underlying focus on new connections to the grid (which it is speculated will primarily relate to new housing, measured in the tens of thousands of connections per year). However, Northern Powergrid is now also mindful of the needs of existing customers connecting these new LCT devices, and particularly the benefit for such customers that will derive from the CVP Open Insights ([see the CVPs section](#) for more detail on this).
- 3.2.40 Northern Powergrid's plan now contains substantial cost forecasts related to the socialisation of connection costs from both Ofgem's 'minded to' decisions on its Access and Forward-looking Charges Significant Code Review (Access SCR), and from the decision to socialise the costs of upgrading existing domestic supplies up to 100 amperes where necessary. In view of the high degree of uncertainty associated with each of these sets of costs, we believe that they should be covered by suitably designed uncertainty mechanisms to protect customers from unnecessary bill increases. We therefore support the principle of how the company proposes these costs be dealt with, but are not in a position to comment on the detail of the mechanisms proposed. We note that Northern Powergrid's estimates for costs are considerably higher than suggested by the impact assessment performed by the Center for European Policy Analysis as part of Ofgem's Access SCR but have not looked into this in view of the proposed use of an uncertainty mechanism.

Major connections

- 3.2.41 Northern Powergrid has an ambitious plan to improve the satisfaction scores of Major Connections customers. We understand Northern Powergrid's intent to improve its systems, its provision of data, and all interactions with customers to help them achieve its ends, i.e. with transactions that are as frictionless as possible. Its published Major Connections Strategy contains initiatives that we agree should improve its processes and customers' experiences.
- 3.2.42 Northern Powergrid's Major Connections Strategy appropriately reflects Ofgem's requirements and has been appropriately guided by stakeholder engagement.
- 3.2.43 Given the nature of connections customers' varying needs, we believe that it is appropriate for Northern Powergrid's performance to be measured principally by customer satisfaction scores. Customers will have more challenging needs as they respond to net zero, bringing forward the connection of high volumes of LCT and particularly new challenges such as electricity storage at scale.
- 3.2.44 Northern Powergrid is proposing that its customer service performance against escalating targets from 84.3 per cent currently to 90 per cent satisfaction by 2028 will be financially incentivised through a financial output delivery incentive. Coupled with its proposed annual report on delivery for customers in this area, this will enable Ofgem and stakeholders to hold Northern Powergrid to account against its commitments.

1. Vehicle to grid – the EV exports power to the network.

3.3 Maintaining a safe and resilient network

Safety

- 3.3.1 We recognise Northern Powergrid's commitment to the health and safety of the public and its staff, and the company's strong track record. The general proposals Northern Powergrid is making for improving the health, safety and wellbeing of its staff seem appropriate, although we note that plans may still need to be changed as the continuing impacts and legacy of COVID-19 work their way through.
- 3.3.2 We observed significant interaction between Northern Powergrid and its stakeholders and customers and were satisfied that Northern Powergrid explained the issues appropriately to them. The plan has been shaped to appropriately reflect stakeholders' views.
- 3.3.3 We were not initially fully convinced that Northern Powergrid was setting itself, and its contractors, sufficiently challenging targets for the safety of contractors' staff. This view allowed for the generally higher-risk profiles of the activities that contractors undertake in comparison with those of Northern Powergrid's own employees. In analysis subsequently presented to us, Northern Powergrid has reasonably demonstrated, via the work mix that contractors' staff undertake and its associated risks when compared to Northern Powergrid's own staff work mix, that the targets set for contractors are appropriately stretching. We are now satisfied that the contractors' targets set an appropriate catch-up in 2023-28 to Northern Powergrid's existing own performance.
- 3.3.4 We challenged Northern Powergrid that its proposed single headline Occupational Safety and Health Administration (OSHA) reportable incident rate is insufficient and does not give the leading indications of underlying performance that is revealed by monitoring the wider spread of lesser (non-reportable incidents). Our concerns included the lack of a proposal for any metrics for the health and wellbeing of employees. Northern Powergrid has now confirmed that it does monitor a range of leading indicators and it has told us that it intends to consider how to make them more widely available to stakeholders, noting they are already shared formally with relevant trade unions. [Annex 5.4](#) of the business plan includes a set of indicators on health and wellbeing, which we welcome. We encourage the company to consider publishing its full range of safety indicators.
- 3.3.5 We did not initially observe any discussion about the safety implications for staff and public of the increase of power sources in and around customers' homes. This includes battery storage, EVs, solar generation, and more. Northern Powergrid's plan now includes recognition of this issue for its own staff, and for community energy advisers to include these risks in their interaction with customers.

3.4 Reliability, availability, and resilience

Note on Storm Arwen

Northern Powergrid's stakeholder engagement and plan development were completed before Storm Arwen struck and so the final business plan does not address the storm impacts and the appropriate response. The section below reflects that position, and we make some early observations about the implications of Storm Arwen [in section 7](#).

Reliability and Availability

- 3.4.1 Northern Powergrid's engagement during the development of its business plan demonstrated that most customers are broadly content with the current general levels of reliability and availability. Customers have, however, expressed a desire that reliability to those who suffer the most frequent and/or the longest power cuts is improved. We agree with Northern Powergrid that investment to catch up to, and remain abreast with, other DNOs in these areas is necessary and appropriate. This is a particularly important judgement given the associated increases in costs. Customers do care deeply about reliability, but also take it for granted and do not see that they should be paying more for it.
- 3.4.2 Northern Powergrid has engaged extensively and appropriately with customers and stakeholders, recognising that customers' experience of interruptions, or lack of them, does tend to condition their responses. Northern Powergrid's plan to catch up with other DNOs' general performance, which will run over 10 years rather than five, represents an appropriate response to the balance of feedback, and lines up with customers' wishes and expectations. (See the note above about Storm Arwen).
- 3.4.3 Northern Powergrid is making a commitment to improve supply reliability for customers whose experiences falls well outside of the system wide averages. This is even though many of these do not fall within Ofgem's narrow, system-focused definition of Worst Served Customers. This commitment will cover several customers experiencing repeated interruptions, and those suffering interruptions of more than 12 hours and more than six hours. We agree that these customers should be the top priority for reliability improvement work, noting that the investment in system automation will also contribute positively to this area.
- 3.4.4 Northern Powergrid has explained to both us and the Technical Panel its intentions to use technology and innovation in the quest to reduce the incidence of faults and the effects of those faults on customers. Our opinion, which is mirrored by the Technical Panel, is that Northern Powergrid's approach is appropriate, but that this remains an area where the company needs to maintain a strong appetite to find new innovations that drive further improvements in customer experience and service.
- 3.4.5 Through the dialogue between the Technical Panel and Northern Powergrid, Northern Powergrid has improved the policy content of the relevant Engineering Justification Papers (EJPs), i.e. EJPs 10.1 to 10.3. The EJPs submitted as part of the final business plan reflect broad agreement between the Technical Panel and Northern Powergrid on the points the Panel raised.
- 3.4.6 We welcome Northern Powergrid's initiatives to use mobile batteries to help with supply restoration, and support the concept of trialling microgrids as a solution for some of the customers with the worst reliability experience. However, we believe that there are important questions still to be addressed about the most appropriate regulatory and commercial models for exploring the potential for the microgrids approach. These are being addressed via CVP4 and associated innovation projects – we expand on this view in the section on CVPs.

- 3.4.7 We challenged Northern Powergrid on the possibilities of using customer flexibility to support partial restoration of supplies (i.e., where customers' heavy power appliances, such as EVs and heat pumps (HPs), are temporarily constrained while the network capability is restored to full capacity). Northern Powergrid has only partially responded to this challenge, more fully in relation to Extra High Voltage faults and industrial demand. This is as much a DSO initiative as a reliability one.
- 3.4.8 Northern Powergrid should be able to harness the increasing amount of data and information available to it via the data and digitalisation strategy. This is implicit in Northern Powergrid's approach, but both we and the Technical Panel would have liked to see this articulated more directly.
- 3.4.9 We challenged some of the fault incidence forecasts presented by Northern Powergrid, particularly for low voltage (LV) cables. We were surprised that, given all the initiatives, the projected fault incidence volumes were flat over 2023-28. We expected that the application of innovation and the better use of data would drive down both the incidence and costs of LV faults in particular.

Overarching approach to resilience

- 3.4.10 Northern Powergrid has set out a collaborative, forward looking approach to resilience in an annex to the main business plan. The emphases on continuous improvement and on monitoring of changes in the threats to be managed are welcomed.
- 3.4.11 We witnessed much of the analysis undertaken by Northern Powergrid's Technical Panel on resilience and the challenge that the Panel has provided to Northern Powergrid over the past 18 months. The Technical Panel's challenges and recommendations were appropriate and Northern Powergrid has assimilated them into the plan appropriately.

Asset Resilience

- 3.4.12 The scale of the investments in this area is larger than in any other plan area, even decarbonisation. This means that even a relatively small part of the replacement investment programme involves a spend that is bigger in absolute terms than certain other components of the plan that are examined in detail. For example, Customer Service and Connections investments are both dwarfed by just the overhead line clearance programme costs. In addition, this is a highly technical part of the plan, and so does not lend itself well to wide stakeholder input.
- 3.4.13 Northern Powergrid has tried hard to explain this area of the plan to stakeholders and customers. This was naturally challenging given most stakeholders lack of familiarity with electricity assets and how they individually contribute to the unnoticed service that customers enjoy. Nevertheless, we are satisfied that Northern Powergrid's plans as presented do broadly represent what customers want and value – particularly in balancing the need to make progress towards net zero and keeping bills affordable.
- 3.4.14 We have been scrutinising the company's plan and its major components both with Northern Powergrid's in-house experts and with the Technical Panel. Much of the detail of the investment in asset resilience is laid out in the EJPs. We have had sight of the EJPs and note that all the EJPs have been reviewed either by the Technical Panel, or by an independent consulting engineer, whose report we have reviewed.
- 3.4.15 Northern Powergrid points out the obvious synergies between replacing assets and reinforcing the network by sizing the replacement assets to meet projected demand as assets are replaced. We are not in a position to scrutinise such decisions in depth (and assume Ofgem will undertake this role), but the logic of the approach and the claimed benefits seem reasonable.

- 3.4.16 We recognise the joint work done over decades between Ofgem and the network companies to agree an appropriate approach to managing DNOs' regulated assets. We acknowledge its detailed complexity and assume that Ofgem believes it to be fit for purpose in managing these extensive dispersed asset bases.
- 3.4.17 We would welcome a more accessible set of metrics to describe asset health. For example, Northern Powergrid is planning on a 1.1 per cent deterioration (reducing from 2.8 per cent considering synergies from decarbonisation investment) in the monetised risk of its asset base during 2023-28 (which it plans to hold fairly flat out to 2050 with a maximum projected risk increase of about seven per cent over the following price control). We simply cannot interpret whether the underlying absolute level of asset health is appropriate and similarly whether the profile of changes over 2023-28 and the future is also appropriate, particularly in the absence of any historical or benchmarking comparisons.
- 3.4.18 We believe that better collection, integration, and management and analysis of data could yield significant benefits in cost effectively safeguarding asset resilience. Northern Powergrid's plans for Data and Digitalisation, discussed [in section 4.1 Data and Digitalisation](#), place a strong emphasis on collecting the data and building the analytics infrastructure needed to do this. There is still a considerably way to go for the company to go to fully exploit this data and reflect this into its approach to managing asset resilience, but it is now making a decent start on this journey.

Workforce Resilience

- 3.4.19 Northern Powergrid was still developing its workforce resilience strategy when the draft business plan was published, and we had raised a challenge regarding the company's approach to diversity. Since then, Northern Powergrid has developed and published a well-considered Diversity Equity and Inclusion (DEI) plan and made significant changes to its workforce resilience strategy.
- 3.4.20 The company has a strong track record of attracting, training, and retaining people with the skills needed for a traditional DNO role. However, in the next few years it will face significant new challenges associated with the decarbonisation and DSO agendas (and the linked need to digitalise its business). It will need to attract new people with a different range of skills as well as developing the skills of its current workforce. There is likely to be strong competition from other employers for the types of skill that Northern Powergrid will need to successfully transform its business. It will need both to attract people from a wider range of backgrounds than before and to make sure that its workplaces are attractive and rewarding enough to promote staff retention.
- 3.4.21 The company will be competing in a tight market for people with control, environmental and data science skills. In this context diversity represents a huge opportunity (particularly in the light of the gender balance of graduates in, for instance, environmental sciences) so following through on delivering the recently published DEI plan will be essential.
- 3.4.22 The DEI plan identifies three areas that, in the context of Northern Powergrid's business, require particular focus: gender in technical roles; ethnicity; and disadvantage. We welcome this clarity and the commitments made in the plan.
- 3.4.23 The company has engaged with its workforce and has credible plans to work with them to adapt to the new challenges. These plans include training and development with a focus on data and digital skills, an enhanced colleague health and wellbeing programme, and increased workforce engagement (including involvement of the trades unions representing staff).
- 3.4.24 We are encouraged that the company plans to recruit to over 100 new roles in 2022 in preparation for the 2023-28 business plan period, since having the right organisational capability will be a key enabler for successful delivery of the plan commitments.
- 3.4.25 One aspect of workforce resilience that is particularly challenging for all organisations is the evolution of the company culture to match its operating environment. Northern Powergrid, in common with other DNOs, has a culture that is well tuned to providing a dependable and

cost-effective service to its customers. The challenge of the next few years will be to develop greater levels of the organisational and cultural skills needed to successfully negotiate the transition to net zero – agility, adaptability, and outward focus – while safeguarding and developing its traditional ones. This will require continuous focus and attention in the coming years.

- 3.4.26 In view of the crucial importance of workforce and organisational capability and company culture to the success of the journey to net zero it is vital that there is ongoing top-level commitment to and visible leadership of this workforce strategy, and open reporting of progress in delivering it.

Climate Resilience

- 3.4.27 We have closely engaged with this agenda throughout the evolution of Northern Powergrid's thinking. We have had several detailed engagements and are content with the proposed approach.
- 3.4.28 The business plan adopts a primarily asset-driven strategy, but we are encouraged by the link to workforce resilience and wider operational capacity that developed during our interactions with Northern Powergrid. Stakeholder feedback indicates that customers think that it is right and proper to invest in substations to protect against long term risks. The emphasis on rain- and flood-related impacts, but with less focus on snow and ice, has caused us some limited concern with respect to the absence lack of emphasis on the latter. However, Northern Powergrid's approach seems to be in line with national models and regional expectations and the strong focus on extreme heat seems appropriate.
- 3.4.29 We note the increased frequency of extreme weather events and recognise that the climate is currently heated to approximately 1.1°C above pre-industrial levels. Even the most ambitious climate change targets anticipate further heating with associated consequences. We encourage Northern Powergrid to work with the ENA and other external stakeholders to ensure that appropriate data is used when seeking to model the probability of extreme weather events and/or plan for investment and activity related to climate resilience.
- 3.4.30 We support Northern Powergrid's preference to act alongside other utilities, authorities and agencies (including the ENA on behalf of the wider industry) and see funds directed into more collaborative activity to widen resilience. This would see a move away from focusing on defending individual assets to reducing the wider geographical risk across all infrastructure, and strengthening the local resilience response to major events. This is in line with both the systemic nature of climate risk and feedback from willingness to pay work, which suggests that stakeholders have understood the importance of the shift to a more collaborative approach to working.
- 3.4.31 We welcome the inclusion of specific targets for climate resilience outputs, particularly for increased formal collaboration with other relevant agencies as referenced above. In due course we would anticipate having more detailed objectives, targets and associated metrics in place to reinforce the commitments that are presented in the business plan.

Physical and Cyber Resilience

- 3.4.32 Ofgem's guidance on Enhanced Engagement states "CEGs should not attempt to scrutinise matters of Cyber Information Technology (IT) and Cyber Operational Technology (OT)".
- 3.4.33 There are strong linkages between physical and climate resilience and we are content that the intended approach to physical resilience is appropriate, understood by stakeholders and supported.
- 3.4.34 Cyber resilience is an important and complex matter and represents an area of focus and concern. As the industry increasingly embraces digitalisation in the operation of its networks, cyber-attacks present an ever-increasing threat.

- 3.4.35 Northern Powergrid has made this agenda a primary focus during 2015-23 and significant progress has been made in addressing the risks to current operations.
- 3.4.36 We sought clarity that Northern Powergrid had tested the level of understanding/expertise within the stakeholder group around the more complex issues of cyber security. The feedback provided reassurance that the threats, the risks and the need to respond are well understood by stakeholders, although there seems to be much less understanding across that group as to how the identified challenges could be solved.
- 3.4.37 Similarly, we were keen to understand the level of expertise upon which the propositions relied. We were informed that the expertise comes from National Cyber Security Centre and Ofgem (with the cyber and engagement teams). It was also explained that Northern Powergrid has relationships with technology firms with expertise in this area.
- 3.4.38 The potential exposure of Northern Powergrid to attack via external systems (such as those within the supply chain and associated with buying flexibility to deliver network reinforcement) remain a concern.
- 3.4.39 We note the significance of ensuring the resilience of the telecom systems upon which connectivity depends.
- 3.4.40 Cyber security is an inherently national issue, with emerging threats potentially targeting cross-system and cross-vector interoperation, so Northern Powergrid will need to work with other national players to fully secure our energy system.



3.5 Delivering an environmentally sustainable network



Environmental Action Plan

- 3.5.1 We encouraged Northern Powergrid to be bold in its aspirations for the Environmental Action Plan (EAP) in line with stakeholder feedback. We are content that this has been the case while remaining in line with stakeholder feedback. We made several challenges to which Northern Powergrid acknowledged and responded, resulting in a more engagement-driven plan with stronger community initiatives and a cross reference to the commitment to be an anchor organisation. We welcome the alignment to science-based targets and the target to be net zero by 2040 with low levels of off-setting.
- 3.5.2 Though we are content with the position as articulated in the EAP, the CEG continues to encourage Northern Powergrid to proactively engage with suppliers and be ambitious in respect of the cascading of environmental (and other) commitments throughout the supply chain. A supplier code is being developed in-house and is to be a policy-driven document with high-level objectives; Northern Powergrid has indicated that it will rely upon self-assurance. We asked about control measures and were informed that the supplier code is to be an extension of the existing contract documentation. The company's funding of a facility to support suppliers from within the SME community is recognised and supported, particularly in the context of commitments made for Northern Powergrid to establish itself as an anchor organisation.
- 3.5.3 We challenged the assessment of the SF₆ target. Northern Powergrid identified the need to strike a balance between what is reasonable and what is achievable. From a cost perspective there was a need to be careful not to incur undue costs in replacing assets. Northern Powergrid looked at 3kg and 7kg loss scenarios before coming up with an engineering rationale for 5kg – we accept this position.
- 3.5.4 We enquired about the embedded carbon agenda and Northern Powergrid reported that the methodology is under development via the ENA. We recognise that addressing Scope 3 emissions is a complex agenda, particularly where it relates to capital assets and infrastructure. As such, the CEG agrees that an industry-wide approach is likely to be the most effective and pragmatic approach.

- 3.5.5 We welcome the commitment to monitor and report the impacts of new projects in 2023-28. The link to science-based targets for Scope 1 and 2 emissions is welcome as is the sharing of the underpinning work, which has been reviewed with interest.
- 3.5.6 With regard to the potential to increase or enhance biodiversity, we welcome the initiatives and encouraged Northern Powergrid to be bold and ambitious in terms of its approach of managing above ground assets. This is in line with stakeholder feedback.
- 3.5.7 In terms of waste management, we challenged whether the proposed targets are sufficiently ambitious and requested targets be reviewed and a (caveated) stretch target be potentially included. Further discussions resulted in us agreeing with the proposed ambition and associated targets.
- 3.5.8 We recognise the ambition to reduce the carbon and air quality impact(s) of the fleet within performance criteria required by the duty and lease cycles of the various vehicles. A constructive challenge was offered to encourage the faster uptake of ultra-low or zero emission vehicles. The pricing of such vehicles may be prohibitive in the short term due to changing supply constraints and other supply chain pressures. These cannot be defined or resolved within the current business plan although may become apparent soon.
- 3.5.9 We encourage Northern Powergrid to look at collaborative or partnership driven approaches to installing EV and other infrastructure although we recognise the possibility that regulatory and practical constraints might impede this ambition. Our sentiment is to be respectful of the rules but bold and ambitious about the potential to aggregate the impact of related utilities and supporting businesses.
- 3.5.10 In a related point, we encourage the culture of innovation within Northern Powergrid to the core ambitions of the plan in general and the EAP (including decarbonisation) in particular.



4. A smart, flexible energy system

4.1 Data and Digitalisation

- 4.1.1 This is a topic on which we have had, and expect to continue to have, extensive engagement with Northern Powergrid. It is critical to achievement of many of the objectives within the business plan and it is not one on which the company has a strong starting position (although it is not alone among DNOs in this regard).
- 4.1.2 Northern Powergrid published its Roadmap for Digitalisation in January 2020, with an updated version in December 2020. It has used these documents as the basis for a substantial programme of engagement with stakeholders, both within the region and across the wider energy system. This engagement has complemented the extensive customer engagement activities undertaken by the company in developing its Emerging Thinking and Draft Business Plan for 2023-28, which has incorporated Data and Digitalisation alongside other elements of the plan. As noted in [paragraph 4.1.12](#), we welcome Northern Powergrid's plans to explore the use of innovative means to engage more closely with stakeholders on the digitalisation roadmap.
- 4.1.3 The digitalisation strategy has developed significantly over this journey. Northern Powergrid recognised in the original roadmap that it was coming from a relatively low base (scoring itself at three out of 10) on digitalisation. The plan has now been developed in considerable detail and at a good level of granularity. It's clear that there has been a lot of thinking about the benefits of Data and Digitalisation and how they might be delivered.
- 4.1.4 A strong underlying vision is emerging, although it could still be articulated more clearly. The thinking appears to cover all the major systems a DSO is likely to need (for network management, distributed resource management, asset management, flexibility markets, customer management, back office, etc), although it would help a lot to set this out on a clear diagram of the target enterprise systems architecture.
- 4.1.5 The plan is not yet final but, with 15 months until the start of the 2023-28 price control period and with Ofgem's explicit recognition (in the Business Plan Guidance) that it expects digitalisation plans to need further elucidation during 2022, Northern Powergrid has built a decent basis for finalising it and so digitalising their business over the course of the plan period.
- 4.1.6 The strategy in the business plan sets a clear and ambitious vision for digitalisation – “Embrace digital platforms to enable an optimised whole energy system, providing a resilient and efficient service for our region” – built around 10 core areas. These areas are consistent with the feedback received through stakeholder engagement: note that this is a specialist area, so many stakeholders will not hold strong views on how Northern Powergrid should approach Data and Digitalisation.
- 4.1.7 The strategy entails capex investment of £107m over the period. This is embedded within all areas of the business plan (partly in response to our challenge, as discussed in [paragraph 4.1.8](#)), and is estimated to unlock £246m of efficiencies across that wider plan. Although Northern Powergrid has identified a couple of examples of where these benefits will come from (e.g. £62m from advanced analytics, £45m from enhanced network management), we have not seen a full breakdown of these benefits and look forward to seeing more detailed analysis in 2022. Having a clear articulation of the benefits and how/when they will be realised will help Northern Powergrid both to demonstrate progress to external stakeholders and to monitor and steer a complex programme internally.

- 4.1.8 We raised a formal Challenge to Northern Powergrid on the level of detail in the digitalisation strategy. In response, the company has done a lot of work to develop the details of the plan and to link Data and Digitalisation into other sections of the business plan. We welcome this – there are clear signs that Data & Digitalisation are more embedded into the overall business plan. However, we would like to see more detail in areas such as:
- Well-defined and quantified SMART metrics, outcomes and customer benefits, again to aid Northern Powergrid and its stakeholders to visualise the journey to digitalisation and so better monitor and steer the programme
 - Clear phasing of the annual spend on each initiative within the plan
 - Identifying dependencies around integration points in the system architecture
 - Identifying how Northern Powergrid will build systems and processes to address data management and analytics
 - Further detail in the enterprise data model, and on how the company will design dashboards and graphical outputs
 - The Products and Services roadmap that Data and Digitalisation will deliver to Northern Powergrid and its stakeholders
 - The analysis by the Technical Panel has also identified several areas where the company's plans for digitalisation could be strengthened
- As noted above, we think Northern Powergrid has now built a decent basis to develop this detail over the course of 2022, prior to commencement of the 2023-28 period.
- 4.1.9 Effective Data and Digitalisation will entail significant organisational and cultural change within Northern Powergrid. Initial thinking on what this might involve has been done, and costs for it included in budgets. We would still like to see more detail on how this change will be managed.
- 4.1.10 Data and Digitalisation will entail a wide-ranging, complex and interlinked suite of systems implementations and integrations, coupled with substantial organisational and culture change. All IT projects of this nature have substantial risk. Northern Powergrid is aware of this. It has engaged a strong set of partners to work with and recognised that the strategy will develop iteratively as the company engages more actively with the data it is beginning to collect. Thus we should expect some refinement and adjustment of targets as the strategy evolves. This all suggests that the plan would also benefit from further thinking about how progress will be monitored and assured.
- 4.1.11 We therefore suggest that Northern Powergrid consider:
- **Drilling down into the details in the next stage of planning** and working to articulate the benefits more clearly and quantitatively, and to chart out their realisation. This will form a firm basis to visualise potential pathways for the strategy and to assure its effective delivery.
 - **Engaging an independent assurance team with specialist expertise** in such IT programmes to support the programme (working with the other specialist partners Northern Powergrid has identified, e.g. Digital Catapult, Alan Turing Institute, Leeds Open Data Institute).
 - **Developing a clear charter for the Data and Digitalisation Transformation Office**, e.g. as a leader for culture change and developing an agile, data-driven mindset within the company.
- 4.1.12 Northern Powergrid has done a lot of detailed thinking behind the overall vision, but this is still work in progress. We look forward to working with the company over 2022 to understand these details and how they are embedded into the plan so we can be more confident of its deliverability and cost-effectiveness. We also welcome the company's plans to engage in more dialogue with its stakeholders about the Data and Digitalisation roadmap, e.g., via digital tools such as ProductBoard (a software product management platform).

4.2 Transition to Distribution System Operation

- 4.2.1 Northern Powergrid published the first version of its DSO Strategy in December 2018, with updates in October 2019 and in the Draft Business Plan. It has used these documents as the basis for a substantial programme of engagement with stakeholders, both within the region and across the wider energy system.
- 4.2.2 Northern Powergrid has now set out a clear vision for DSO and a thorough plan for achieving that vision. We witnessed the company engaging with its stakeholders throughout the plan's development, and the strategy is consistent with the feedback received through this engagement. This is a specialist area, so many stakeholders will not hold strong views on how the company should approach becoming a DSO.
- 4.2.3 There is still much uncertainty ("the devil in the detail") about exactly what functions a DSO must perform. This partly reflects the general lack of consensus across the sector as to the precise nature and role of a DSO – while the broad functions are agreed, there is still considerable debate about the details, and appropriate metrics are still being defined. Northern Powergrid expects the details to become clear only as DNOs gain some experience of acting as DSOs and the boundaries of what is feasible and desirable for a DSO to do become clearer through experience. It is therefore adopting an iterative approach to defining its exact role and functionality as a DSO, within the broad framework agreed by Ofgem and the industry.
- 4.2.4 We believe this is a reasonable strategy, but it will create challenges for monitoring and steering implementation of DSO. These challenges could be managed by:
- **Defining clear metrics/indicators** setting out how DSO capability is expected to develop, and what visible benefits it will deliver to Northern Powergrid's customers, year-by-year throughout the period. The Business Plan contains good analysis at a high level; breaking it down to granular details and defining specific, visible benefits will help visualise potential pathways to deliver DSO and so to steer the journey as Northern Powergrid and the wider sector learn more about DSO.
 - **Establishing an independent, specialist assurance team** to support the underlying Data and Digitalisation implementation programme.
 - **Undertaking more thorough analysis** of the detailed DSO functions (e.g. to separate core DSO capabilities from DSO enablers) in order to clarify the key capabilities, their disposition across systems and organisational units, and the interfaces this will create.
- 4.2.5 Northern Powergrid has identified a substantial benefit (£156m) resulting from flexibility, largely through avoiding or deferring the need to invest in network reinforcement. We would welcome more detail on how these estimated benefits have been calculated, the range of uncertainty associated with the estimates, and how it expects the benefit to be realised year-by-year through the 2023-28 period. Without this detail, it is difficult to assess factors such as the deliverability of the benefits. Likewise, it is not clear how much of the reinforcement cost saving is avoided entirely, versus how much is simply deferred to a later period. In the latter case the real saving might more accurately be presented as avoiding N years of cost-of-capital rather than the full capital expenditure in the 2023-28 period.
- 4.2.6 This benefit is dependent on actions outside Northern Powergrid's control, with approximately two-thirds of the benefit coming from "price-driven flexibility" (i.e. flex resulting from customer behaviours in response to price signals provided by suppliers and other parties, not directly from Northern Powergrid). Northern Powergrid has bought considerably less "DNO-contracted flexibility" than most other DNOs to date, and will continue this trend through 2023-28, only intending to procure a small amount of such flexibility. This is based on a reasonable assessment of how overall flexibility markets will develop, but it does leave the company dependent on other parties' actions.
- 4.2.7 This strategy would be stronger if coupled with some initiatives (perhaps via innovation projects) to build closer integration to those parties' systems so that Northern Powergrid can send appropriate price signals to them, and to understand potential customer behaviours in response to such signals. ("Price-driven flexibility" is also affected by uncertainties in network pricing driven by delays to distribution use of system charging reform in Ofgem's Access SCR.)

This issue does not represent a risk to keeping the lights on during 2023-28, but it may mean that Northern Powergrid needs to resort more to reinforcement or DNO-contracted flex, reducing the net benefit that it can achieve.

- 4.2.8 This reliance on “price-driven flexibility” may also need thought from the customer service perspective. Flexible customers are likely to raise different issues to customer support channels, for example, so Northern Powergrid may want to think about how it supports suppliers and other intermediaries to service customers delivering the flex it needs.
- 4.2.9 We recommend that Northern Powergrid consider developing a clear customer service package/codes of conduct for DSO and intermediaries (e.g. suppliers) when interacting with flexibility providers.
- 4.2.10 There has been much discussion of how Northern Powergrid will maintain an option to separate DSO from DNO since publication of the draft business plan. The company has chosen to maintain DSO relatively tightly integrated with the rest of the DNO – many DSO functions will be contained within a single directorate, but that directorate will not focus solely on DSO and some DSO functions will be in other directorates.
- 4.2.11 Northern Powergrid’s argument that this will optimise operational efficiency is reasonable, but the argument would be stronger if it had a more thorough analysis of alternative options. To address concerns about conflicts of interest, this tightly integrated model will require strong attention to transparency of decision making, including a strong independent assurance function. Northern Powergrid has made allowance for such a function, but we believe it would be stronger if it reported direct to the board/audit committee.
- 4.2.12 DSO is a new and innovative function, so the baseline for efficiency is still being established. We would welcome more thinking on potential metrics here, so that a clear baseline could be established as DSO functionality is rolled out. For example, a more comprehensive suite of metrics with clearer definitions of these metrics, could help to make it clear how effectively and efficiently the DSO is acting to optimise load flows across the network.
- 4.2.13 Finally, the strategy tends to focus on the technical aspects of becoming a DSO. We are conscious that the transition will entail considerable organisational and cultural change, and would welcome more detail on how this will be managed.

4.3 Enabling Whole System Solutions

- 4.3.1 Northern Powergrid has adopted a broad definition of “Whole Systems”, addressing a wide range of energy sources, distribution vectors and stakeholders within and adjacent to the energy system. We welcome this breadth of vision and the collaborative approach embodied within it.
- 4.3.2 Appropriate to this approach, the company has collaborated with a wide range of stakeholders in developing the strategy, as well as building plans to continue this collaboration throughout the 2023-28 period. For example, there is a clear opportunity to build on the partnership established at the whole systems InTEGReL research site in Gateshead and to develop its regional research and innovation collaborations and build on learnings from major programmes in 2015-23, such as Customer-Led Network Revolution (CLNR) and to engage with the region’s hydrogen trials. We believe that the plan appropriately reflects the feedback received during consultations to date.
- 4.3.3 In discussions with us, the company has noted that “Whole Systems initiatives are largely about bringing a way of thinking to the organisation. Whole Systems thinking identifies issues affecting the wider energy system. It helps define key problems and the role that Northern Powergrid plays in addressing those problems (it might lead on some, collaborate under others’ leadership on some, and simply maintain a watching brief on others). It may then initiate innovation or operational projects to address specific issues.”

- 4.3.4 This essentially frames Whole Systems as a key part of the wider cultural and organisational change that Northern Powergrid is undertaking to become a DSO and to support the energy transition to which the UK has committed with its decarbonisation targets. This is evident in the emphasis placed on Whole Systems throughout the business plan – the small investment in Whole Systems (£15m) contributes to £263m of benefits spread across many areas of the plan. It does this more by helping the company to think about Whole Systems across its portfolio of innovation, implementation, and operational activities than by delivering standalone initiatives under the “Whole Systems” label.
- 4.3.5 We have encouraged the company to clarify how it is undertaking this wider change and the part Whole Systems will play in it. We welcome the breadth of Northern Powergrid’s vision on Whole Systems, but recognise that this will make it difficult to link specific benefits back to the investment being made in this area.

4.4 Innovation

- 4.4.1 Stakeholder engagement has demonstrated that customers support continued investment in innovation, especially if it is targeted on decarbonisation or reliability, but want the company to focus on delivering customer outcomes.
- 4.4.2 We have been satisfied that the strategic framework being employed by the company is a reasonable approach to the issues it is currently facing, that the high-level priorities seem appropriate, and that the plan is ambitious. We welcome the focus on collaboration and high standards of governance in relation to this work. The Technical Panel has highlighted the potential benefits of further collaboration, both within the sector and more widely, and will be helping the company to identify further suitable partners.
- 4.4.3 Northern Powergrid anticipates gaining significant benefits from innovation (e.g. £262m of totex savings from innovation activities in 2023-28). We do not doubt the value of the innovation the company plans to undertake, but we have not seen detailed justification for the claimed benefits from 2015-23 or the expected benefits during 2023-28. The Technical Panel has identified the need for more objective measures of the benefits of innovation to avoid the risk of overstatement.
- 4.4.4 The Technical Panel investigated this area in some detail, and it is also satisfied with the company’s strategy and plans in this regard. The Technical Panel believes that innovation is feeding into all relevant areas of the business plan and that the innovation capabilities set out in the strategy are the ones needed to enable the company to address the risks and concerns most likely to emerge during 2023-28.
- 4.4.5 There is also clearly an opportunity within the 2023-28 innovation framework for all the DNOs to innovate in service provision to customers in vulnerable situations. Northern Powergrid has set out a much more ambitious approach to addressing customer vulnerability within its strategy, which we discuss in [section 3.3](#). It intends to use innovation incentives to support the development of its app (CVP 1) and the use of SilentPower mobile battery vehicles where lengthier restoration timescales are anticipated. This appears to us to be appropriate.

5 Keeping consumer bills low

5.1 Forecasts and scenarios

Decarbonisation

- 5.1.1 Difficulties are faced by all parties (DNOs and Ofgem) in dealing with the challenges and uncertainties associated with decarbonisation and the journey to net zero. We are of the view that Northern Powergrid understands its key responsibilities to enable decarbonisation, and the need to strike an appropriate balance between early investment to facilitate decarbonisation and avoid holding any progress up on the one hand, and the implications of the increased costs (of either investment ahead of need or in the extreme of stranded assets) for customers on the other.

Scenarios and Investment

- 5.1.2 In developing its forecast scenarios, Northern Powergrid has engaged with many relevant stakeholders to understand the broad range of possibilities and has developed a 'best view' scenario in line with Ofgem guidance. In doing this, it has used appropriately expert consultants and the sharing of relevant scenario data with National Grid Electricity System Operator (ESO) and other DNOs. The Technical Panel has scrutinised this work and is satisfied that the pathway identified provides an adequate mitigation of the risks stemming from the uncertainties associated with the pace and pathway of decarbonisation.
- 5.1.3 We accept Northern Powergrid's view of how its investment plan relates to the range of scenarios considered and the implications for 2023-28 and future review periods. We recognise Northern Powergrid's logic in determining the minimum definite investment that must be made in 2023-28 if all future pathways to net zero by 2050 are to remain viable, and that this should be funded as necessary investment. We are less able to determine if Northern Powergrid has estimated these quantities correctly, and so are not able to comment on the values Northern Powergrid is proposing as ex-ante costs versus uncertainty mechanism remunerated costs.
- 5.1.4 We also recognise Northern Powergrid's logic in seeking volume drivers for the effects of the uptake of HPs, EVs, and associated service assets upgrades, and all based on the number of new devices served.
- 5.1.5 There is a question about what investment might be needed to monitor the volume drivers and to build the capability to respond to them rapidly/with agility. However, the ongoing work on uncertainty mechanism between Ofgem and the companies is noted, and we assume that these issues will be included.
- 5.1.6 We have raised concerns about the visibility and accommodation in the plan of hydrogen as an industrial, heating and transport power source. Northern Powergrid has continued to discuss the prospects for hydrogen right up to the finalisation of the business plan – we are pleased to see the commitment to an annual formal review of hydrogen prospects with appropriate stakeholders.

5.1.7 We note Northern Powergrid's interaction with stakeholders who might be providers of flexibility service in the near future, and that the engagement has recently become active. We believe that Northern Powergrid needs to maintain effective dialogue with all possible flexibility providers (including the energy suppliers who will provide the products that drive price driven flexibility). This is an important area in view of the benefits from flexibility assumed in the plan and the possible extra costs of reinforcement if the flexibility does not materialise.

5.2 Just Transition to Net Zero

5.2.1 We recognise that the concept of a just transition has been widely adopted by policy makers and is embedded in multiple commitments, including the COP21 Paris Agreement. In this context, we understand that a just transition seeks to ensure that the substantial benefits of a green economy and the decarbonisation of the energy networks are shared widely, while also supporting those who stand to lose economically – be they businesses, communities, workers or consumers.

5.2.2 Northern Powergrid has taken steps to ensure that its plan addresses the needs of all its stakeholders in relation to the transition to net zero. We have commented on the:

- diversity of the stakeholder groups consulted on the development of the business plan and the breadth of options discussed ([section 2](#));
- engagement with local authorities and others on scenarios and pathways to net zero, and the commitment to increase this during 2023-28 ([section 2](#));
- increase in support being proposed for vulnerable customers to help them negotiate the transition ([in section 3.2](#));
- package of support to be made available to businesses within its supply chain to assist compliance with changing procurement requirements ([see 3.5 delivering an environmentally sustainable network](#)); and
- the company's plans for further engagement with its customers and supply chain during 2023-28, both to understand its developing views and to provide support and guidance ([section 2](#)).

We also comment later in this report ([in section 6.2: Consumer Value Propositions](#)) on the CVPs being proposed by the company, one of which is targeted at vulnerable customers and aims to help them access advice and services to help them negotiate the transition to net zero. This is considered to be in line with Northern Powergrid's commitment to be an anchor organisation.

5.2.3 There will always be more that could be done on this topic. Individuals will need considerable support to understand and negotiate the changing energy supply market (and the appropriate role of the DNO alongside energy suppliers and others is not currently unambiguously defined). Similarly, planning authorities will need extensive support to ensure that their spatial plans optimise the rapidly developing possible solutions for decarbonising. While the business plan places focus on a just transition for customers, we recognise the potential impact on businesses and certain industrial sectors. We encourage Northern Powergrid to consider the potential implications of investment decisions and to work collaboratively with external partners in pursuit of a decarbonisation plan that leaves no one and nowhere behind.

5.2.4 Valuable lessons will be learned about customer attitudes and the issues they face in decarbonising their homes and lifestyles. Reducing barriers to take up of LCTs across the customer base will be a long term and ongoing issue and Northern Powergrid's partnerships in communities will help identify the issues that require policy changes or new incentives to drive the transition nationally and within their region. But we accept that Northern Powergrid has recognised the importance of its role and expertise in the journey to net zero and has made appropriate arrangements within its business plan given the current state of knowledge.

5.2.5 This is an area that merits constant monitoring and a willingness among all parties to adjust their approach as our understanding of the challenges of the transition and the potential solutions develops.

Cost information

- 5.2.6 Northern Powergrid has progressively presented the business cases for all their major areas of investment and larger projects to both us and the Technical Panel. In other words, we and the Technical Panel have been able to challenge the scope and content of these business cases as Northern Powergrid developed them, particularly in ensuring that an appropriately wide range of options has been considered. Northern Powergrid responded well to these challenges: the plan and the EJPs reflect these challenges.
- 5.2.7 Northern Powergrid has used the ENA Common Evaluation Methodology on some projects, but we have not examined this in detail.
- 5.2.8 We did not have the opportunity to discuss the detailed explanations for all the totex efficiencies set out in the business plan, particularly the substantial ones projected for after 2028 (and it will be important that these are captured in future price reviews). We understand that there are considerable uncertainties relating to the largest item in 2023-28, “Flexibility and smart grid solutions”. In addition, we note that the largest contribution to this item comes from price-driven customer flexibility, which is not within Northern Powergrid’s control.

5.3 Managing Uncertainty

Uncertainty Mechanisms

- 5.3.1 Northern Powergrid has proposed that the Uncertainty Mechanism for load-related expenditure is a volume driver linked to the uptake of EVs and HPs (there is also the provision for a Price Control Reopener if necessary). This means that customers bear the risk of higher volumes and the company carries the unit cost risk, which seems sensible if the unit costs can be determined up front with a reasonable degree of accuracy.
- 5.3.2 The company has assessed how much investment should be included in baseline allowances by considering the delivery risks beyond 2023-28 associated with the future investment needed under all reasonably foreseeable scenarios. We are not in a position to undertake a detailed assessment of the level of risk under different scenarios, but the principle of the approach is sound given the objective of avoiding the networks being a constraint on reaching net zero.
- 5.3.3 The company argues that, if demand growth is slower than forecast, any new or upgraded assets will still be needed soon after 2023-28 so the net present cost of such early investment is limited. Ofgem is also in a position to limit any potential windfall gain that it could make by not spending its allowances. The possible consequences of over investment in 2023-28 should therefore be limited and are likely to be much less than the potential consequences of not being able to ramp up sufficiently to meet demand in the following price control period.
- 5.3.4 We accept the logic that baseline allowances should be set at a level that will not create unacceptable risks to the future delivery of the network capability needed to achieve net zero, and expect Ofgem to provide an overall mechanism to limit and disincentivise windfall gains from under delivery. We also support the principle of a volume driver linked to LCT take-up for any investment beyond this level (with a Reopener available as a backstop).
- 5.3.5 For Ofgem’s Access SCR Northern Powergrid is proposing a volume driver based on number and type of connections. We believe this to be an appropriate approach. We note that the company’s estimates of the likely costs seem to be significantly higher than the assessment on which Ofgem based its minded-to decision, and that these estimates are highly dependent on multiple assumptions about customer behaviours. All of this speaks to the need for a well-framed uncertainty mechanism.
- 5.3.6 Northern Powergrid is also proposing a volume driver to cover the costs of service cable and fuse upgrades to domestic customers, following Ofgem’s clarification that all such costs should be socialised. The company’s proposal is that the volume allowed should be linked

to actual customer requests for upgrades, to manage any risk of unnecessary work being funded. Again, this means that customers bear the risk of higher volumes and the company carries the unit cost risk, which seems sensible if the unit costs can be determined up front with a reasonable degree of accuracy.

Real Price Effects

- 5.3.7 Real price effects (RPEs) arise when prices of inputs vary by more (or less) than the general measure of inflation that cost allowances are linked to – historically and at 2023-28, Ofgem retrospectively adjusts DNO allowances to take account of RPEs by relying on differences between the growth of benchmark indices intended to reflect the evolution of DNOs' underlying costs and general inflation
- 5.3.8 Northern Powergrid is proposing indexation for estimated RPEs that has been calibrated by independent experts, the economic consultancy NERA, which was commissioned jointly with other DNOs. The company's proposals (and cost forecasts) include NERA's bespoke indices for most categories, though it uses a more basic specification for one category, general labour.
- 5.3.9 We support the use of independent experts to determine RPEs both to estimate benchmark indices and to determine the share of sectors costs to be used to determine the final index. The NERA report is a comprehensive and robust evidence-based assessment; it is jointly commissioned and used by DNOs – providing a whole-sector view and therefore not being affected the business model of individual companies; it was also updated in November 2021 to consider changes in Ofgem Business Plan Guidance regarding RPEs following recent price and inflation dynamics.
- 5.3.10 One of the concerns we had in response to the draft plan was that the RPE assessment was not taking sufficiently into account the new high price growth macroeconomic environment – this has now been addressed through the NERA addendum and the new indices determined on the back of that.

Ongoing efficiency

- 5.3.11 Northern Powergrid has also engaged economic experts NERA to assess the evidence on ongoing efficiency. Similar to the analysis for RPEs, the NERA report is a comprehensive and robust evidence-based assessment; it is jointly commissioned by the ENA and used by other DNOs. It also addresses Ofgem's BPI guidance by outlining the efficiency assumptions submitted for each expenditure, along with evidence of how these assumptions have been derived.
- 5.3.12 NERA's report on ongoing efficiency concludes that the range for efficiency of 0.1 per cent to 0.5 per cent per year 'defines the widest range of assumptions that could reasonably be derived from the evidence.'
- 5.3.13 The company has adopted the most challenging assumption within this reasonable range of 0.5 per cent. NERA advised for the 0.3 per cent middle ground but we support Northern Powergrid's position to go for 0.5 per cent as it is at the most challenging end of the spectrum. We are satisfied with the approach taken and conclusions reached by Northern Powergrid.
- 5.3.14 However, while a significant level of detail and analysis is provided to justify the level of ongoing efficiencies and RPEs used in the development of the plan, much less detail is provided to show or explain how the RPEs and ongoing efficiencies are then used in the costing of the plan.
- 5.3.15 In the main plan document and in the annex 6.2: our costs in detail (which is not publicly available), reference is made to the impacts of ongoing efficiencies and RPEs but it is not clear exactly how these are applied to the figures and they are not spelled out separately. Finally, we feel more detail could be provided with regard to the £465m of decarbonisation synergy savings beyond 2028.

5.4 Late and early competition

- 5.4.1 Reference is made in the plan to Northern Powergrid's openness to adopt Ofgem's early and late models of competition and to assess projects in terms of viability and customers' interests and to minimise customer detriment. We understand that Northern Powergrid does not have any projects within its 2023-28 plan that meet the minimum cost threshold to be subject to this requirement.
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6. Business Plan Incentive

6.1 Minimum requirements

- 6.1.1 Our opinion is that Northern Powergrid’s plan contains all the material required by Ofgem’s guidance and it is presented in a clear and understandable manner.
- 6.1.2 The plan also contains extensive evidence of consumer expectations and willingness to pay. The plan for delivery is credible given the significant time remaining to refine it before the start of the 2023-28 plan period.
- 6.1.3 The plan has also been robustly challenged through both stakeholder engagement and the Enhanced Engagement process. In addition, Northern Powergrid established a Technical Panel to challenge the engineering proposals in their plan and has taken advice from its Social Issues Expert Group. The company has also made appropriate use of external consultants to support the plan.

6.2 Consumer Value Propositions

Northern Powergrid’s CVP 1 – One-stop app solution for vulnerable customers

- 6.2.1 We are supportive of the development of Northern Powergrid’s app and recognise that it could add value beyond Ofgem’s baseline expectations, particularly with the planned enhanced functionality. The company aims to provide a faster response in power cut situations when customers are potentially at their most vulnerable, providing proactive communication to those that are digitally enabled/smartphone users and keeping customers fully updated and supported during the length of the interruptions. This was articulated as a priority by customers throughout all 2023-28 engagement activities on customer service and vulnerability. Clearly in circumstances where there are very lengthy outages and customers are unable to charge their smart phones the app may have more limited benefit.
- 6.2.2 Northern Powergrid will also go beyond this to improve access to other current and new services across multiple channels and the app is intended to offer more than a two-way communication just about power cuts.
- 6.2.3 We challenged Northern Powergrid to raise awareness of the raft of its services among vulnerable households – particularly the benefits of priority services membership, partner programmes, and advice and information on offer in response to multiple vulnerabilities and changing needs. If properly designed and rolled out this app could be an important tool to achieve that.
- 6.2.4 As decarbonisation becomes a reality the app has the potential to help customers navigate support and advice on LCTs and with other changes where they may need to adapt their homes because of energy system changes.
- 6.2.5 It is designed for the digitally enabled vulnerable customers with the additional aim of freeing up customer service time for customers who prefer other communication routes. It has the potential eventually to be rolled out to all other customers, which we support while recognising efforts to prioritise and focus initially on vulnerability.

- 6.2.6 We believe that there could be real long-term value to this, but it will of course depend on take-up, functionality, and usability. We raised concerns about these issues and the costs associated with the development.
- 6.2.7 We are satisfied that while the recovery of development costs is ex-ante, the risk associated with additional financial reward linked to CVPs is low as 70 per cent of the CVP award is based on the target usage and associated benefits.
- 6.2.8 The development of the app will be done in-house and the costs include a proportion of the workforce within the Data and Digitalisation team. Some initial enabling digital developments will be put in place to underpin the development of the app, but the resources and capabilities would be in place during year one of the 2023-28 price control period. We have not seen detailed costings but a breakdown of costs associated with different aspects of design and maintenance of the App were set out. While the costs seem high these are to ensure compatibility across Northern Powergrid systems, and to comply with cyber security standards.
- 6.2.9 Northern Powergrid told us that the assumed demand and take-up is based on evidence from stakeholder engagement activities and from actual take-up and associated values that its existing partnership with Citizens Advice Newcastle has delivered. (For example: it is expected that by the end of 2023, 73 per cent of UK adults will access their bank via an app on their mobile phone.) Of the 6,000 PSM customers engaged in a customer survey, 75 per cent said that they were likely or highly likely to use the app.
- 6.2.10 The relatively low levels of savings from energy advice are based on findings from research from the UK Energy Research Centre (UKERC) and the low switching numbers are based on Ofgem's 2020 consumer survey data on switching (where five per cent enrolled in auto-switching) and assumes an even lower number of vulnerable customers will switch – just one per cent. Current market conditions make this difficult to assess.
- 6.2.11 We were particularly concerned however that the app may not deliver the cost savings as set out in the SROI model. A significant amount is based on dual fuel customers switching supplier/tariff (average annual assumed benefit of £250). The current price cap means that most customers may be better off staying with their existing supplier during this period of high global wholesale prices. We propose that Ofgem reviews the methodology that monetises switching within the SROI model that is used across the DNOs, and that it reflects assumed market conditions for the period 2023-28.
- 6.2.12 Also, we consider that the calculation of £37 benefit to the five per cent of users feeling more in control of their lives is questionable. The proxy bank value that has been used is based on "Cost of a programme designed to increase health and wellbeing in the workplace". Northern Powergrid has used the Sia Partners model (based on the Treasury Green Book) to apply this to vulnerable households at home. We recognise the difficulty in monetising social benefits but ask that Ofgem take a view on this calculation.
- 6.2.13 We challenged Northern Powergrid on what had appeared to be double counting of benefits and were assured that the assumed savings are all calculated for specific interventions, and this is more clearly set out in the Final Business Plan. The benefits are all claimed by Northern Powergrid rather than by the delivery agencies, which we understand to be the same basis for all DNO submissions.
- 6.2.14 Overall, we support the development of the app and, while the current market circumstances make the monetisation of benefits problematic currently, support this CVP due to its future potential.

Northern Powergrid's CVP 2 – Self-service analytics toolkit

- 6.2.15 We are supportive of the initiative, as a logical and necessary digitalisation and customer service initiative. We note Northern Powergrid's engagement with customers and the enthusiasm that some stakeholders have to expand Northern Powergrid's current capabilities in this area.
- 6.2.16 An immediate and key use of such a tool will come from the growth of LCTs that customers will be installing in their existing installations – particularly solar generation, storage, EVs and HPs. We have received assurance from Northern Powergrid that these existing customers are just as much the focus of the tool's development as customers seeking new physical connections to the network.
- 6.2.17 Northern Powergrid has stated that aggregators will benefit from the tool by virtue of it making it clear where flexibility can offset reinforcement. We acknowledge that additional information can potentially help aggregators identify opportunities but remain unsure as to how a tool designed to serve individual customers can be used by aggregators unless their specific needs are included in the design of the tool.
- 6.2.18 The value of this proposition is also based on its imminent introduction. We recognise that its functionality will be increased in stages but are concerned that a three- to four-year period for its full implementation seems quite a long time, given the customer value.
- 6.2.19 We are aware, and Northern Powergrid acknowledge, that some of the value of this CVP might be affected, i.e. reduced, by Ofgem's Access SCR.

Northern Powergrid's CVP 3 – Dynamic voltage optimisation for domestic energy efficiency

- 6.2.20 We are attracted to the objectives of this initiative and to its method. However, at this stage of development we still have some reservations.
- 6.2.21 It is unfortunate that Northern Powergrid refers to this CVP as improving domestic energy efficiency. We do not believe that Northern Powergrid's development of this CVP addresses efficiency; it simply reduces, at least potentially, the amount of energy consumed in a specific period. While we remain fully supportive of the concept of this CVP, we are concerned that until it has been proved that there are no definite negative effects on customers, especially the fuel-poor and vulnerable, it might be misleading to think of this CVP in terms of efficiency.
- 6.2.22 Northern Powergrid has included some definite proposals for monitoring the effects (if any) on vulnerable customers and the fuel poor. We still believe it is important that checks are built in to ensure that the reduced power input associated with reduced voltages does not compromise the warmth of customers who rely on electrical heating and we are pleased to note that Northern Powergrid has committed to monitor this closely.
- 6.2.23 The headline energy saving stated per customer is attractive, but we are concerned that Northern Powergrid has not built sufficient confirmation of savings into the project. We believe that this CVP would be strengthened if a process to monitor benefits realisation was specifically included (e.g. by baselining energy consumption prior to the intervention. Ideally this would be undertaken at service level (e.g. heat and light) –then assessing the change to consumption post intervention, and combining this with surveys of consumer experience; done at sufficient scale to give both statistical significance and allow concerns about privacy to be managed via aggregation).
- 6.2.24 Northern Powergrid is aware of the need to preserve the capability to reduce demand further in emergencies, ie to meet the requirements of OC6 of the Grid Code. We note that Northern Powergrid will also be investigating any conflicts with the CLASS ancillary services and suggesting how such conflicts should be resolved.

- 6.2.25 We note that Northern Powergrid has assessed the internal resources to fully manage the rollout and subsequent operation. We assume this can be flexed appropriately based on experience.

Northern Powergrid's CVP 4 – Phase one roll-out of next generation energy system

- 6.2.26 We think this is a solution that the UK should be exploring. It offers significant potential, both to improve reliability for customers and communities that are currently less well served and, more widely, to open new functionality and cost/performance options for energy networks, local energy markets, etc.
- 6.2.27 However, the solution also raises significant questions about the boundary of the regulated network versus market solutions, with accompanying implications for system operations, customer service, financing, charging, etc. If the CVP only addresses the technical issues of building and operating microgrids without addressing these wider concerns, then it may be missing an opportunity, and may risk going down some blind alleys.
- 6.2.28 We asked Northern Powergrid for assurance that these wider concerns will also be addressed. The company has done this by demonstrating how the CVP will link to a wider set of innovation projects that address such issues. This is a reasonable approach, although we recommend that Northern Powergrid consider how this linked group of projects might share knowledge and learnings, e.g. by forming a common advisory board across all the projects.
- 6.2.29 We do not think these questions should delay the CVP going ahead. This is an avenue that should be explored and getting on-the-ground experience of running microgrids such as this in a range of locations must be part of that exploration. However, it needs to be explored in that wider context.
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7 Sections on matters of importance to us that are not included in the body of the report

7.1 Risks to delivery of the plan and its benefits

7.1.1 The main risks to delivery of this plan stem from the uncertainties over:

- the pace and pathway of decarbonisation in practice;
- the uptake of customer flexibility;
- the ability of Northern Powergrid and its suppliers to deliver the proposed programme of investments in a timely and efficient manner;
- Northern Powergrid's ability to develop its organisational and workforce capability to deal effectively with all the associated challenges (particularly those associated with DSO and data and Digitalisation).

7.1.2 We have discussed each of these risks with the company and accept that it is in the process of developing appropriate plans to deal with the risks that are under its control.

7.1.3 However, some of the risks, such as the actual pathway to net zero and the uptake of customer flexibility, are not within Northern Powergrid's control to any great extent. The company is dependent on the actions of third parties to mitigate these risks. For these risks, careful monitoring and the preparation of suitable contingency plans are particularly important. We address the likely consequence of the customer flexibility risk materialising in [section 4.2 Transition to Distribution System Operation](#) above. It could have a significant impact on the expenditure needed to reinforce the network.

7.1.4 Northern Powergrid has analysed the supply chain risks (and set out its approach to managing them in annex 7.1 of its business plan). It is confident of being able to manage the risks during 2023-28, but concerns about the risks in the following price control period and beyond are important in determining its position on the minimum investment in decarbonisation needed in 2023-28. We agree with the logic of this approach, but we are not able to comment in more than general terms on the level of risk associated with different levels of decarbonisation investment.

7.1.5 The issue of organisational and workforce capability, which is more of a long-term strategic issue for the company than a regulatory one, is addressed in paragraphs [3.4.19 to 3.4.26](#).

7.2 Storm Arwen

7.2.1 Just as Northern Powergrid's final business plan was being submitted, northeast England experienced a severe storm, named Arwen. This caused extensive damage to Northern Powergrid's network and extended disruption to many of its customers. Customers also experienced considerable difficulty in contacting the company and in obtaining reliable information about the likely duration of the interruption to their electricity supply.

7.2.2 It is far too early to state with any degree of confidence what the most important lessons for the future are, and Ofgem and the Department for Business, Energy and Industrial Strategy (BEIS) are currently undertaking investigations into the event. It is of critical importance that Northern Powergrid (and others) identify the actions necessary to ensure a more effective response to future extreme events and that these are included in their plans – including the company's plan for 2023-28.

7.2.3 We are keen to see an open, inclusive, and thorough ‘lessons learnt’ exercise conducted into all aspects of the event:

- weather forecasts
- preparations of all parties
- underlying health of the assets damaged or destroyed by the storm
- the appropriateness of current design standards, and the potential for new technologies to improve network resilience
- performance of Northern Powergrid’s relevant systems
- immediate and longer-term response of Northern Powergrid and the wider industry in restoring electrical supplies
- support given to people without power (especially those in vulnerable circumstances)
- communications with customers
- effectiveness of the civil contingency arrangements
- compensation paid to customers for the disruption to their lives.

7.2.4 It should be recognised that the findings of this exercise could have significant implications for Northern Powergrid’s business plans for the remainder of the current business plan period and for 2023-28.

7.2.5 We are happy to assist with the work to identify and implement the actions needed to safeguard future service to customers in whatever way we can add most value.



Annexes and Glossary

A1 Establishment of the Customer Engagement Group and ways of working

- 1.1 The independent Customer Engagement Group (CEG) was established by Northern Powergrid in 2019 in response to a requirement from Ofgem. Each electricity Distribution Network Operator (DNO) has such a group to scrutinise business plans for the next price control period, known as RIIO-ED2, which will run from 2023 to 2028.
- 1.2 The role of the CEG is to provide independent challenge to Northern Powergrid on its 2023-28 business plan and provide its own views to Ofgem and the public on whether the business plan addresses the needs and preferences of consumers.
- 1.3 We operate at arm's length from both Northern Powergrid and Ofgem, so that we can independently act in the interests of the company's customers and stakeholders.
- 1.4 To ensure this independence, our chair Justin McCracken was selected after an open competition (including a search run by a recruitment consultancy) overseen by one of Northern Powergrid's non-executive directors, and with Ofgem approving the shortlist of candidates.
- 1.5 The Chair then selected the group members following another open competition. Information about the Chair and members can be found at ceg.northernpowergrid.com.
- 1.6 The Terms of Reference were drawn up to reflect and conform with Ofgem's guidance on enhanced engagement for the next business plan period, and have been agreed with the company (see [annex 2: Customer Engagement Group Terms of Reference on page 53](#)).
- 1.7 Independence and transparency are key principles underpinning all the CEG's work. We have put in place [a set of arrangements](#) to demonstrate how we secure independence and transparency, together with maintaining extensive records of engagement with Northern Powergrid and internal exchanges that underpin the rationale and analyses that support the views of this report:

Ensuring our independence

- While observing our Terms of Reference, we have had regard to all relevant guidance from Ofgem.
- Members (including the chair) were appointed following open advertisement of the vacancies.
- Each member was appointed in a personal capacity and agreed to declare any potential actual or perceived conflicts of interest.
- Support is provided by a Northern Powergrid support manager who has a clear duty of confidentiality to us.

Ensuring our transparency

Our microsite ceg.northernpowergrid.com sets out:

- Our role and Terms of Reference
- Members
- Register of interests
- Reports and subgroup meetings
- A list of our challenges to Northern Powergrid and a brief description of their status

2. Our discussions

- 2.1 We have met regularly since our formation towards the end of 2019. Since the introduction of restrictions related to COVID-19 all meetings have been held by video conference, but there has been no interruption to or delay of our schedule of work (except that some planned familiarisation visits to Northern Powergrid have had to be put on hold).
- 2.2 Many of our discussions have involved Northern Powergrid staff presenting their plans and approaches to developing them. Initially we also had induction sessions on the company and its activities (including visiting some parts of the business) and a briefing on the regulatory framework from an expert consultant. We have also had discussions with senior members of Ofgem's team for the 2023-28 price control period, and our chair has had regular meetings with Ofgem staff and the chairs of the other CEGs.
- 2.3 The effectiveness of our scrutiny role depends on our access to information about Northern Powergrid and its activities, and the openness of its staff in discussion with us. We have been given timely access to all the information that we have requested and our discussions with staff have always been open and constructive. We have had contacts with staff at all levels in the company from chief executive to front-line workers, and access to non-executive directors. While we have had less contact with Ofgem staff, they too have been helpful and supportive. We have received from both the company and Ofgem all the support appropriate to our role.

3 We have scrutinised Northern Powergrid's stakeholder engagement work.

- 3.1 The CEG has observed a substantial number of Northern Powergrid's stakeholder engagement events to form an independent assessment of their quality and effectiveness. COVID-19 restrictions have meant that almost all these events have been 'virtual' using digital platforms and this has enabled CEG members to observe more than would have otherwise been possible.
- 3.2 In total, CEG members have observed more than 100 events covering a diverse range of topics and involving many different types of stakeholder. [See annex 3: Stakeholder engagement events observed by CEG.](#)

4 We have worked with other expert panels.

- 4.1 Northern Powergrid established a Social Issues Expert Group (SIEG) in 2012 to provide advice on its work in relation to vulnerable customers. Chaired by Derek Lickorish (former chair of the government's Fuel Poverty Advisory Group), the SIEG provided input on the development of the 2023-28 business plan and contributed to the design of the company's propositions on vulnerability. We sought and received the SIEG's views on Northern Powergrid's customer vulnerability proposals.
- 4.2 In 2020, Northern Powergrid established a Technical Panel of independent experts chaired by Professor Phil Taylor (one of the company's non-executive directors) to scrutinise the technical aspects of the plan. The panel includes members who are expert in a wide range of aspects relevant to the company's business plan. (See annex 1: Technical Panel and remit.) We sought and received input from the Technical Panel on many of the critical aspects of Northern Powergrid's engineering investment plan, and used this input to underpin our own assessment of the plan.

5 Issues and challenges we raised

- 5.1 One of the CEG's key objectives is to challenge Northern Powergrid's business plan. In the early stages of our work, when we were scrutinising preparations by Northern Powergrid for its consultation on the main aspects of its plan (launched in September 2020), we raised many issues that we asked the company to consider and respond to. These related to the thinking at the time on the development of its business plan, and the proposals for consulting local stakeholders.
- 5.2 In total we raised 134 issues, many of which were aimed at improving the effectiveness of Northern Powergrid's stakeholder engagement.
- 5.3 But these issues also covered matters such as:
- the proposed approach to protection of the interests of vulnerable customers;
 - decarbonisation of the energy system;
 - innovation;
 - resilience;
 - customer service on connections;
 - supply chain strategy;
 - supporting the government's plans for a post-COVID-19 economic 'Green Recovery';
 - improving reliability (particularly for customers who receive the worst service); and
 - ensuring independence in the scrutiny of the highly technical aspects of its plan, which most stakeholders will not be able to assess.

- 5.4 Northern Powergrid responded positively to the issues we raised and, in many cases, modified its proposals because of our interactions. All of these issues have now been dealt with, either directly or by rolling them into wider challenges to the company (see below).
- 5.5 Following Northern Powergrid’s major engagement exercise on its developing plan, we raised six challenges to its potential proposals.
- 5.6 Northern Powergrid’s consideration of the issues and challenges raised by the CEG over the past two years, and the dialogue between the company and the CEG, has led to many modifications to the propositions in its plan. We believe that this has resulted in a plan that better reflects the needs and preferences of customers and stakeholders.

A2 Technical Panel and Remit

Prof. Phil Taylor (Chair): Pro Vice-Chancellor for Research and Enterprise at Bristol University

- Internationally leading researcher and industrial expert in energy systems, who has worked in industry and academia for more than 25 years
- Co-director of the £20m Engineering and Physical Sciences Research Council (EPSRC)'s National Centre for Energy Systems Integration (CESI)
- Leader of the £10m EPSRC Supergen Energy Networks Hub

NB Prof Taylor is also a non-executive Director of Northern Powergrid and his role included supporting the management team as it reviewed and processed the feedback provided by the Technical Panel.

Prof. Jianzhong Wu: Professor of Multi-Vector Energy Systems and Head of School of Engineering, Cardiff University

- Research focuses on smart grid and multi-vector energy systems
- Contributed to more than 50 EU, EPSRC and industry-funded projects
- Published more than 250 peer-reviewed papers
- Co-director of £18m UK Energy Research Centre (UKERC) and Co-Principal Investigator of £24m Flexible Integrated Energy Systems (Flexis) project
- Director of International UNILAB on Synergies between Energy Networks
- Fellow of Energy Institute and Fellow of the Learned Society of Wales

Prof. Konstantinos Chalvatzis: Professor of Sustainable Energy Business at Norwich Business School (NBS), University of East Anglia (UEA)

- Associate Dean for Innovation in Social Sciences and chairs the UEA-wide interdisciplinary theme ClimateUEA
- Research focuses on energy sector innovation including smart grid and storage and the role of energy in the sustainability performance of corporate organisations
- UEA's Principal Investigator in projects funded with over £22m by the EU, industry partners and investors
- Former Inaugural Chair of EU DG Energy's WG on Consumer Engagement with Smart Grid and Energy Storage systems
- Former consultant and project manager in the energy sectors of the Balkans, Eastern Europe, Caucasus and Northern Africa

Dr Robin Preece: Senior Lecturer in Future Power Systems within the Department of Electrical and Electronic Engineering at the University of Manchester

- Research focuses on power system operation with large numbers of volatile and variable low carbon technologies
- Consulted with energy companies on the dynamic impact of integrating new technologies and power electronics into large systems
- Active member of the Institution of Engineering and Technology (IET), Institute of Electrical and Electronics Engineers (IEEE) and International Council on Large Electric Systems (Cigre)
- More than 70 international publications on energy and power systems.

Scott Milne: Head of Insights at Energy Systems Catapult (ESC)

- ESC is an independent, not-for-profit centre of excellence set up to accelerate the transformation of the UK's energy system and ensure UK businesses and consumers capture the opportunities of clean growth
- Consultant on exploring low carbon energy transitions, quantitative modelling of long-term energy and emissions trajectories and qualitative analysis of energy trends for the UK

Geraldina Iraheta: Chief Commercial Officer at Digital Catapult

Joined the panel in May 2021

- Digital leader, technologist and strategic thinker with wealth of experience spanning a broad range of sectors including mobile telecoms, fintech, manufacturing, creative, and digital health
- Helping businesses in driving competitive advantage through innovation, advance digital technology strategy and speed of executive in high growth and high-tech environments. Working with a range of stakeholders, local governments, academia, large enterprises, start-ups and investors
- Responsible for managing and growing £15+ research commercialisation and collaborative R&D for the Digital Catapult and its partners
- Worked across multiple regions on multimillion-pound technology and innovation programmes across Latin America, USA, Europe and Japan

Beth Warnock: Power System Practice Manager at Energy Systems Catapult

Joined the panel in May 2021

- Technical expertise includes electricity system operation, modelling and simulation, investment planning and integration of renewable technologies onto the network and into markets
- Over 14 years of experience with the Electricity System Operator in a variety of disciplines. Experience includes identifying future operability challenges including voltage, stability and fault level through the system operability framework
- Collaboratively worked with several DNOs looking at whole electricity system operational solutions to connect DER in transmission constrained areas

Remit of the Technical Panel

1. The objective of the panel is to act as a critical friend and provide a level of impartial scrutiny and quality assurance of the analysis carried out by Northern Powergrid as part of its business planning activity for 2023-28. This will include, but is not limited to, the choice and application of modelling methodologies employed, the inputs to that analysis and the outputs/conclusions of that analysis.
2. The panel will test how robust and fit for purpose the investment planning process is, ensuring Northern Powergrid's plan is suitably balanced in terms of risk between company and consumer and in terms of the needs of current and future customers.
3. To enable this objective the panel will have the freedom to question Northern Powergrid on any part of the operational cost base but with particular focus on condition/performance-based replacement/refurbishment, reliability, resilience, environmental, innovation and network utilisation.
4. The panel will be examining and discussing the engineering justification documents that support the business plan that will not be typically reviewed by the CEG.
5. The scope of the panel will be a cross-cutting review ensuring that the net zero predictions are core to our investment decisions regardless of the initial driver to intervene (condition, performance, safety, etc). The panel will test the assumptions on use of customer flexibility, smart grid solutions, conventional solutions and smart grid enablers used to deliver a 'net zero-ready' network for the least possible cost.
6. The panel will assess the innovation strategy and digitalisation plan, as being important enablers of the net zero transition.

A3 Customer Engagement Group Terms of Reference

1. Background

- 1.1 Northern Powergrid has established an independent Customer Engagement Group (CEG). This group is being formed in response to Ofgem's requirements as part of its next price review (known as RIIO-2) process, and its role is to represent the interests of the customers and communities that Northern Powergrid serves.
- 1.2 Under the Ofgem process all electricity distribution companies are required to submit draft business plans to Ofgem, covering the period 2023-28. The CEG will challenge the company to ensure that its developing plan properly reflects customers' interests and Ofgem's guidance on priorities for the price review.
- 1.3 These priorities include ensuring that the electricity grid:
- is among the safest and most reliable in the world;
 - keeps network charges on bills as low as possible;
 - supports the target of net-zero carbon emissions for 2050 by enabling the rapid roll-out of low carbon technologies, including electric vehicles, and the development of a charging network to support them;
 - supports new customers in getting connected to the grid quickly, efficiently and at least cost;
 - enables people to produce their own energy and sell it easily;
 - delivers great customer service; and
 - helps fuel-poor households, and those that are most vulnerable from a loss of supply, by understanding their needs and tailoring their services in response.

2. Role:

- a. The CEG will operate at arm's length, independent from both the company and Ofgem, to provide challenge to the Company on its business plan for RIIO-2 and provide its own views to Ofgem and the public on whether the Company's business plan addresses the needs and preferences of consumers.
- b. This work of this group is separate from the Company's ongoing stakeholder engagement activities, which will continue. The CEG will not seek to duplicate these activities. Rather, it will assess and report on the quality and scope of the Company's stakeholder engagement, and the extent to which its findings are reflected in the company's plan.
- c. The CEG will not have any decision-making powers in respect of the business plan. All such powers still rest with the Company. The CEG will not be jointly responsible for the business plan that the company submits to Ofgem and the ownership of the business plan remains solely with the company.

3. Duties and scope:

- a. In carrying out its purpose of providing challenge to the Company's business plan, the CEG will focus on areas where there is the need to improve customer outcomes, and where it has the expertise to scrutinise and challenge.
- b. The CEG's report will consider the following areas (including but not limited to):
 - i. the Company's overall priorities and approach;
 - ii. the Company's approach to sustainability and resilience;
 - iii. the Company's proposed outputs and associated total expenditure (including level of cost efficiency improvements);
 - iv. the quality of stakeholder engagement the Company has undertaken to inform their proposals;
 - v. the approach and support that the Company provides to vulnerable customers;
 - vi. the company's approach to innovation, including incorporating innovation into its business;
 - vii. the range of scenarios that the Company has taken into account to anticipate future network requirements and the company's approach to managing uncertainty and associated risks;
 - viii. what alternatives to the investment proposals the Company has considered including from parties offering alternative and non-network-based solutions;
 - ix. any issues of relevance to the region served by the Company, including any significant investment choices in the area, and provide challenge to decisions made by the Company when considering competing interests and perspectives.

This list will be kept under review and amended as appropriate.

- c. The following is outside the scope of the role of the CEG:
 - i. the consideration of financial issues, such as the cost of capital, treatment of debt or the level of gearing in the Company. This is reserved to Ofgem.

4. Outputs and deliverables:

- a. The primary output from the CEG will be an independent report to Ofgem on the Company's business plan. This should be submitted directly to Ofgem at the same time as the company submits its business plan, and made public. In its report, the CEG will highlight areas of agreement and disagreement between the CEG and the Company, including how the Company has responded to challenges that have been raised by the CEG throughout the process. The report will highlight where there is or has been disagreement among members of the CEG. The report will provide a view on the degree to which the Company has explored different options, considered different viewpoints, and properly reflected these in its final plan. It will provide Ofgem with independent evidence for Ofgem to consider alongside other relevant matters in its assessment of the Company's business plan.

The CEG will also:

- b. be represented at any "open hearings" proposed by Ofgem once Ofgem has received the Company's business plan. Attendance will be by the chair on behalf of the CEG and should be in person if this is required by Ofgem.
- c. meet regularly (at a frequency to be decided by the chair), and produce outputs from its meetings including:
 - i. minutes and actions for each meeting;
 - ii. challenge and issue logs, updated after each meeting, capturing challenges by the CEG to the Company's business plan.
- d. meet with Ofgem and the RIIO-ED2 Challenge Group (CG) periodically to provide feedback on the progress made by the company in respect of the Company's business plan, and on the process of producing the business plan itself.

5. Chair:

- a. The CEG has an independent chair, whose role will include leading discussions and chairing meetings of the CEG. The chair must act independently and not as a representative of a particular organisation or group of customers.
- b. The chair will be the principal representative of the group in contacts with other parties (including the Company, Ofgem, and the CG).
- c. The chair is responsible for ensuring that members of the CEG have a good understanding of the main obligations, issues and priorities required to carry out their role as members of the CEG.
- d. The chair should seek to facilitate open, informed discussion and consideration of issues by the CEG.

6. Membership:

- a. The CEG will be constituted in such a way that members between them have the range of knowledge, skills, and expertise necessary to scrutinise and challenge the company's plan in all the areas set out in Section 3 of these Terms of Reference.
- b. Individual members will provide expertise relating to their discipline to the CEG, contributing their views as individuals and not seeking to represent any group, organisation or constituency other than the interests of current and future consumers.
- c. Members must ensure their contributions enable the CEG to function in a collaborative and cohesive manner.
- d. Members may be asked by the chair to represent the CEG in meetings, including public open hearings in support of the chair.
- e. Members must inform the chair and secretariat in advance if they are unable to attend any meeting.
- f. The chair shall work with the company to recruit members of the CEG and be prepared to justify their selection to the company and to Ofgem (if required). The chair is responsible for notifying the company if any member(s) of the CEG wishes to leave the CEG and for managing any such leavers while ensuring that the overall role of the CEG is not affected.
- g. A member may be removed from the group by the chair, in consultation with the company, if they have committed a serious breach of the standards of conduct laid down in the Terms of Reference.

7. Conduct of the CEG

- a. The independence of the CEG chair and members from the Company and Ofgem is essential. The CEG must scrutinise and challenge the Company's business plan as it is developed and, in doing so, seek to achieve the best possible outcomes for present and future consumers.
- b. The work of the CEG will be conducted in as transparent a manner as possible, without compromising either individual rights or the company's commercially confidential information. The CEG will maintain webpages with an up-to-date record of its membership, Terms of Reference, and the progress of its work.
- c. The chair and members will observe the highest standards of integrity and independence and comply with the principles established by the committee on standards in public life ([see the Nolan Principles](#)).

- d. All members must declare any conflicts of interest that may be relevant to their role as a member of the CEG. A conflicts of interest register will be maintained by the CEG, and kept available for public scrutiny. Members must also declare any conflicts of interest at the start of any meeting of the CEG.
- e. The CEG's work will be programmed, so far as is possible, to interface smoothly with the needs of Ofgem and the CG and the Northern Powergrid business plan development timetable.
- f. The CEG should challenge the Company's internal assumptions (including raising expectations about what 'good'; looks like) and ensure that the Company is keeping pace with the latest thinking both nationally and internationally.
- g. All members are expected to work collaboratively and proactively with the other members of the CEG, sharing relevant learning and information with each other to assist with their role as members of the CEG.
- h. The CEG will try, where possible, to reach a consensus position on all matters that it discusses. However, where this is not possible, then the view of the majority of the members of the CEG will prevail. Where a consensus has not been reached, CEG members may request that specific individual views are recorded in the minutes, even though the majority view will prevail. In the case of a tie between members of the CEG the chair will have the casting vote.
- i. Members of the CEG may receive commercially sensitive data or personal data relating to named individuals in connection with their role as CEG members. Members of the CEG must agree to keep all such information confidential and to abide by all laws, regulations and legislation in respect of such information (including the processing of any such information).
- j. Members of the CEG must agree to enter into any separate agreements with the Company in respect of confidentiality, intellectual property and/or data protection as the Company may reasonably require.

8. Resources and information

- a. The Company will provide the CEG with the following information and resources to assist the CEG in carrying out its role: secretariat support, meeting facilities, etc. All relevant information regarding the business plan, and its background (e.g. relevant government policies, regulatory requirements; planning scenarios).

9. Meetings with the Company

- a. The CEG will meet formally with the Company at least once every three months.

10. Quorum

- a. Four members of the CEG including one member from each of the subgroups and a designated chair.

11. Variations to terms of reference

- a. Any changes to these terms of reference must be agreed in writing by the chair of the CEG and the company. The terms of reference will be reviewed once a year.

12. Transparency

12.1 The CEG will have a webpage which will include:

- a. the membership of the CEG;
- b. a register of conflict of interests;
- c. the Terms of Reference; and
- d. an overview of the main issues discussed at the CEG meetings.
- e. a record of areas of active challenge.

13. Definitions

For the purposes of these Terms of Reference, the following terms have the following meanings:

- “Company” means Northern Powergrid (Northeast) plc (company number: 02906593) and Northern Powergrid (Yorkshire) plc (company number: 04112320)
- “Ofgem” means the Office of Gas and Electricity Markets.

The Nolan Principles

The seven principles of public life apply to anyone who works as a public office holder. The principles also apply to all those in other sectors that deliver public services, so it is appropriate that CEG members, who are appointed to represent the interests of customers and communities, should adhere to them. The principles are:

- 1. Selflessness**
Holders of public office should act solely in terms of the public interest.
- 2. Integrity**
Holders of public office must avoid placing themselves under any obligation to people or organisations that might try inappropriately to influence them in their work. They should not act or take decisions to gain financial or other material benefits for themselves, their family, or their friends. They must declare and resolve any interests and relationships.
- 3. Objectivity**
Holders of public office must act and take decisions impartially, fairly and on merit, using the best evidence and without discrimination or bias.
- 4. Accountability**
Holders of public office are accountable to the public for their decisions and actions and must submit themselves to the scrutiny necessary to ensure this.
- 5. Openness**
Holders of public office should act and take decisions in an open and transparent manner. Information should not be withheld from the public unless there are clear and lawful reasons for so doing.
- 6. Honesty**
Holders of public office should be truthful.
- 7. Leadership**
Holders of public office should exhibit these principles in their own behaviour. They should actively promote and robustly support the principles and be willing to challenge poor behaviour wherever it occurs.

A4 Stakeholder Engagement events observed by the CEG

Wave 2 engagement: 77 events observed by CEG members.

Wave 3 engagement: 28 events observed by CEG members.

Wave 4 Business Plan Acceptability Testing: survey testing observed, and final survey reviewed.

Topics covered:

Vulnerable customers	1
Decarbonisation/climate change/environmental impact	17
Consumer Panel	16
Network reliability	4
Innovation	2
Delivering a social legacy	1
Skills	1
Working with you to shape our plans	2
Willingness to Pay (WTP) – vulnerable customers	2
WTP – domestic customers	2
WTP – SME	2
WTP – Future	2
Connections	7
SME Panel	5
Innovation festival	3
Regional conference	6
Trade Union engagement	3
Resilience	1
University engagement	3
Distributed Generator (DG) Owner Forum	1
Independent Distribution Network Operator (IDNO) Forum	1
Intergenerational research	2
Asset Resilience	2
Reliability and Availability	2
BPAT – domestic customers	1
BPAT – SME	1
BPAT testing with energy champions	6
Customer service and giving consumers a stronger voice	2
Communities and environment	2
Bill impact, acceptability and affordability	2

Glossary of Terms

Access and Forward-looking Charges Significant Code Review (Access SCR): Ofgem review to ensure electricity networks are used efficiently and flexibly; reflect users' needs so consumers can benefit from new technologies and services; and avoid unnecessary costs on energy bills.

Aggregators: energy service providers that increase or moderate the electricity consumption of a group of consumers in response to total electricity demand on the grid. Aggregators can also operate on behalf of a group of consumers producing their own electricity, by selling their excess electricity.

Alan Turing Institute: the national institute for data science and artificial intelligence, with headquarters at the British Library.

Anchor organisation: an institution that has an important presence in a place, usually through a combination of being a largescale employer, the largest purchasers of goods and services in the locality, controlling large areas of land and/or having relatively fixed assets; and one that is tied to a particular place by its mission, histories, physical assets and local relationships.

Assets: physical electricity network infrastructure, such as cables, power lines, poles, substations and other equipment, digital assets (e.g. IT systems) as well as others such as financial assets.

Auto-switching: a service that compares the market to find the best deals for individual consumers then switches them automatically, notifying previous suppliers and setting up the new supplier on behalf of consumers.

Biodiversity: a measure of the number of different species of living organism that are present within a given area, also including the number of representatives of each species, and the variety of habitats within the area.

Business Plan Acceptability Testing (BPAT): Northern Powergrid's stakeholder engagement exercise to establish views on business plan propositions.

Business Plan Guidance: Ofgem guidance document directed at electricity distribution network companies and their stakeholders. It sets out the information Ofgem expects to see in companies' business plans for RII0-ED2 and how it will assess those plans.

BPI: Business Plan Incentive. Elements of the Business Plan that have performance based financial incentives

CEPA: a global, economic and financial policy consulting business.

Challenges: a request by the CEG to Northern Powergrid asking the company to address or reconsider a significant aspect of their draft proposals which, in the CEG's assessment, was not adequately fulfilling the potential to address stakeholder needs or preferences.

CO₂: carbon dioxide – the most common greenhouse gas.

Community energy advisors: new community-based Northern Powergrid roles responsible for delivering advice and support to communities, partners and local organisations, including decarbonisation advice and support to households, community

groups, local organisations and businesses, as well as signposting to external partners offering energy efficiency advice and support. They will be able to refer vulnerable households to external partners for support.

Connections: the term for connecting to the electricity network. Types of connection can include new buildings, EV chargers, or small- and large-scale electricity generation such as solar panels.

COP21 Paris Agreement: an international agreement on climate change. It was adopted by 196 Parties at COP21 in Paris, on 12 December 2015, and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

COVID-19: An infectious disease caused by coronavirus 2 (SARS-CoV-2).

Customer-Led Network Revolution (CLNR): a 2014 smart grid project by Northern Powergrid and partners to show how UK electricity networks can rise to the challenges and opportunities of a low carbon future.

Customer Load Active System Services (CLASS): uses network voltage control to manage electricity consumption.

Customer panel: a representative stakeholder panel of Northern Powergrid customers, including domestic consumers, rural customers and future consumers.

Customer relationship management (CRM): processes and systems that compile, manage and analyse customer data across multiple channels, such as website, telephone, live chat, direct mail, marketing materials and social networks.

Consumer Value Propositions (CVPs): Ofgem's business plan guidance states, 'companies may bid for a reward on the quality aspects of its plan as revealed through the CVP. In its CVP, a company should demonstrate the additional value its plan will generate for existing and future consumers and consumers in vulnerable situations. The reward will be reflective of this additional value.'

Cyber information technology (IT): a field within information technology that protects computer systems – software, networks and information – and prevents unauthorised use, changes or access to electronic data.

Cyber operational technology (OT): physical technology (hardware) including industrial control systems (ICS), supervisory control and data acquisition (SCADA) and distributed control systems (DCS). Where cyber IT is concerned with information confidentiality, integrity and availability, cyber OT prioritises safety, reliability and availability.

Data: facts and figures collected for statistical analysis, which may include customer data (names and addresses), network data, financial data.

Decarbonisation: the reduction, and ultimately elimination, of greenhouse gas (GHG) emissions.

Decentralised energy system: a system where energy generation is not concentrated in fewer, large capacity sites and instead numerous, smaller-scale energy generation units connect to the distribution network to deliver energy to local customers.

Demand Side Response (DSR): changes in the power consumption of an electric utility customer in response to changes in the electricity complex such as wind and solar power output. Often supported with financial incentive.

Digitalisation: focused digital and technology agenda that supports the integration of digital technologies to improve everyday business activities.

Distributed Energy Resource (DER): smaller-scale power generators and controllable loads (like electric vehicles) that are connected to the local distribution networks.

Distributed generation: these are generators connected to ("embedded" in) the distribution system, rather than the transmission system.

Diversity, Equality and Inclusion (DEI): separate but interlinked issues. Equality refers to treating everyone fairly, challenging discrimination and removing barriers to create equal opportunities. Diversity refers to different values, abilities, and perspectives, and creating environments that welcome and value diverse backgrounds, thinking, skills and experience. Inclusion refers to equal access to opportunities and resources, and making reasonable adjustments to facilitate participation.

Distribution Future Energy Scenarios (DFES): distributed forecasting scenarios undertaken by every Distribution Network Operator to enable the organisations to picture possible energy futures and explore the issues they raise. Inputs include variable predictions on low carbon technology (LCT) uptake, generation and energy efficiency, with assumptions informed by government policy, stakeholder engagement, regional knowledge and market information.

Distribution Network Operator (DNO): DNOs own, operate and maintain the electricity distribution networks.

Distribution System Operator (DSO): DSOs securely operate and develop an active distribution system comprising networks, demand, generation and other flexible DER.

Distribution Use of System (DUoS): distribution network charges.

ED2: The Electricity Distribution price control for 2023-2028. See RIIO-ED2

ED3: The Electricity Distribution price control to follow ED2, probably for five year period

Extra high voltage (EHV): electricity conveyed at 33,000 or 66,000 volts.

Emerging Thinking: Northern Powergrid document published in August 2020

Energy Networks Association (ENA): the industry body representing energy network operators in the UK and Ireland.

ENA Common Evaluation Methodology: an approach to standardise the framework for network investment decisions across DNOs from April 2021 onwards.

Energy Champions: 12 individuals – including domestic customers (urban and rural), SME customers, representatives of vulnerable groups and company staff – recruited by Northern Powergrid and its Customer Panel to improve how it is educating customers on the energy transition. Their focus was to improve customer communications, explain complex topics by coaching engagement leads and improve materials by adding accessible language and imagery.

Energy networks: for electricity this is also referred to as 'the grid'. Energy networks are the wires and pipes that carry electricity and gas to properties – they differ from the energy supplier, which sells consumers the actual electricity and gas consumed.

Energy Systems Catapult: an independent, not-for-profit organisation set up to accelerate the transformation of the UK's energy system, using a whole system view to identify and address innovation priorities and market barriers to decarbonisation.

Energy transition: the shift from fossil fuels-based energy production and consumption, such as oil, natural gas and coal, to renewable energy sources such as wind and solar, and the use of batteries, as part of global economic decarbonisation.

Engineering Justification Papers (EJPs): Ofgem-regulated documents that set out the scope, costs and benefits for major projects or aggregated investment programmes aimed at reinforcing the network or improving asset health.

Environmental Action Plan (EAP): the assessment and profiling of environmental impacts and designing strategic interventions to mitigate and address those impacts, and report on the progress.

Electricity System Operator (ESO): National Grid ESO is the electricity system operator for Great Britain, managing national electricity flows to ensure that supply and demand are balanced.

EV: Electric Vehicle

Extreme weather events: the Intergovernmental Panel on Climate Change (IPCC) defines such events as those “that is rare at a particular place and time of year”, while an extreme climate event is “a pattern of extreme weather that persists for some time, such as a season”. They include “temperature extremes, heavy precipitation and pluvial (precipitation) floods, river floods (alluvial), droughts, storms (including tropical cyclones), as well as compound events where two or more events, not necessarily individually extreme, occur together or in succession and thus cause severe impacts”. Storm Arwen is a recent example.

Flexibility: the ability to increase or decrease the production or consumption of energy at a given or requested time to support the wider electricity network and optimise capacity available for customers.

Fuel Poverty Advisory Group: now called the Committee on Fuel Poverty (CFP), an advisory non-departmental public body, sponsored by the Department for Business, Energy & Industrial Strategy (BEIS), to advise on the effectiveness of policies aimed at reducing fuel poverty, and encourage greater coordination across the organisations working to reduce fuel poverty.

Fuel poverty: there are different definitions of fuel poverty and metrics for measuring the extent and depth of the problem. In England, the government has refined the way in which it measures fuel poverty and uses a Low Income Low Energy Efficiency indicator (LILEE). Under LILEE a household is considered to be fuel poor if they are living in a property with a fuel-poverty energy efficiency rating of band D or below (E,F,G) and when they spend the required amount to heat their home they are left with a residual income below the official poverty line. The three important elements in determining whether a household is fuel poor are household income, household energy requirements, and fuel prices.

GB FES: Future Energy Scenarios for Great Britain. The Energy System Operator’s scenarios outline four different credible future of energy pathways for the next 30+ years. GB FES considers energy demand and supply on a whole system basis.

Granularity: the inclusion of many small details that make understanding more clear.

Green economy: the low-carbon sector comprising businesses such as recycling plants, LCT manufacturing and other schemes, jobs and projects that contribute to decarbonisation.

Gross Demand: the total energy demand of a given region. It represents the quantity of energy necessary to satisfy consumption within the designated geographical region.

GW: gigawatt – one thousand megawatts (million kilowatts) of electrical power.

GWh: gigawatt hour – a measure of electrical energy equivalent to a power consumption of one thousand megawatts (million kilowatts) for one hour.

Heat pump: electrical heating, working somewhat like a refrigerator in reverse

High voltage (HV): electricity conveyed at 11,000 (or 6,000, 6,600 or 20,000) volts.

InTEGReL: the UK's Integrated Transport Gas Electric Research Laboratory, a multi-vector integrated energy systems research and demonstration facility investigating utility scale infrastructure operated by Newcastle University in partnership with Northern Gas Networks and Northern Powergrid.

ISO 14001: the International Organisation for Standardisation's criteria for environmental management systems.

Issues: a request from the CEG to Northern Powergrid, arising from the early discussions on development of the plan, to consider an action to improve either the process for ensuring the plan reflects the balance of stakeholder views or an aspect of the proposals in the plan itself.

Local Area Energy Plan (LAEP): an approach for local and sub-regional institutions to explore different future local energy scenarios to help inform and support local authorities, distribution network operators, business and communities to plan for a cost-effective low carbon transition.

Low carbon energy system: an energy system that uses energy sources that do not produce carbon dioxide emissions, such as solar and wind.

Low carbon technologies (LCTs): technologies that have the ability to reduce carbon dioxide emissions traditionally associated with energy consumption (e.g., electric vehicles, electric heat pumps, solar panels).

Low Income High Cost metric: UK government measurement of fuel poverty, replacing the former Low Income High Costs (LIHC) indicator. See fuel poverty, above.

LV cables: low voltage power cables.

LV network: low voltage network – network less than 1,000 volts.

Major connections: connections to the network (see connections, above) requiring substantial work on the network, "upstream" of the point of connection

MW: Megawatt – one thousand kilowatts of electrical power.

MWh: Megawatt hour – a measure of electrical energy equivalent to a power consumption of one thousand kilowatts for one hour.

National Cyber Security Centre (NCSC): UK government organisation providing advice and support on cyber-security threats for the public and private sector.

NERA: economic consulting firm.

Net zero: legally binding greenhouse gas emissions target which requires the UK to reduce its net emissions by 2050. Net zero by 2050 was enshrined into UK law in June 2019.

Network constraints: areas of the network where the demand or generation exceed the designed network capacity.

Network Investment Strategy: Ofgem says this "sets out the process for the cost benefit analysis undertaken to provide understanding of the interventions that can be efficiently applied to manage losses."

Northern Powergrid: electricity distributor for the North East, Yorkshire and northern Lincolnshire, covering 3.9m homes and businesses.

ODI-F: Ofgem's Outcome Delivery Incentive (financial) aimed at driving service improvement.

ODI-R: Ofgem’s Outcome Delivery Incentive (reputational) aimed at driving service improvement.

Ofgem: independent energy regulator governed by the Gas and Electricity Markets Authority (GEMA).

Open Data Institute: UK non-profit working with companies and governments to build an open, trustworthy data ecosystem.

OSHA: Occupational Safety and Health Administration.

Peak demand: when the most electricity is being used on the network at any given time.

Price Control Deliverable: Ofgem framework for ED2 (2023-28) business plans, where price control funding is linked to the delivery of outputs specified in the licence. This framework provides for the adjustment of the level and timing of allowances in the event the output is not delivered, not delivered to the specification required, or delivered late.

Price Control Reopener: Ofgem mechanism for cost categories where there is significant uncertainty or change in expenditure requirements. The reopener mechanism allowed network operators to propose adjustments to baseline expenditure allowances during a specific window.

Priority Services Membership (PSM): a database of customers who may need additional support or be more vulnerable, due to medical dependence on electricity, poor mobility, age or other needs. Previously known as the Priority Services Register.

ProductBoard: a software product management platform.

Propositions: specific outcomes and proposals for each section in Northern Powergrid’s ED2 business plan.

PV generation: solar photovoltaics – another term for solar panels.

Real Price Effects (RPEs): cost changes that increase in price faster or slower than the Office for National Statistics’ (ONS) Consumer Prices Index including owner occupiers’ housing costs (CPIH) measure of inflation used as standard in Northern Powergrid’s revenue allowances.

Resilience: the Intergovernmental Panel on Climate Change (IPCC) defines resilience as “the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity of self-organisation, and the capacity to adapt to stress and change.” In the context of ED2, resilience refers to Northern Powergrid’s asset resilience (ability of the company’s assets to withstand age-related risks and the increase in electricity usage due to decarbonisation), climate resilience (ability of the company, its assets and the network to withstand the impacts of climate change), and physical and cyber resilience (ability of the company’s IT and OT assets to withstand the impacts of climate change, physical threat, and cyber-attacks).

RIIO-ED1 or ED1: the current price control period for electricity distribution network operators that runs from 1 April 2015 to 31 March 2023. RIIO stands for Revenue=Incentives+Innovation+Outputs

RIIO-ED2 or ED2: the next regulatory price period, set by Ofgem, which runs from 1 April 2023 to 31 March 2028.

Roadmap for Digitalisation: Northern Powergrid document published in January 2020 and later updated, outlining its digitalisation plan.

Scenarios: see DFES, above.

Science-based targets: clearly defined and measurable targets for companies to limit greenhouse gas emissions. The Science Based Targets initiative (SBTi) defines targets as “science-based’ if they are in line with what the latest climate science deemed necessary to meet the goals of the Paris Agreement.”

Scope emissions: Scope 1 emissions are direct greenhouse gas emissions that occur from sources that are controlled or owned by an organisation (e.g., emissions associated with fuel combustion in boilers, furnaces and owned or leased vehicles and equipment). Scope 2 emissions are indirect emissions associated with the purchase of electricity, gas, steam, heat, or cooling. Scope 3 emissions relate to wider footprint such as emissions from the production of goods procured by the organisation, business travel (other than in company-owned vehicles), and employee commuting.

SF₆: sulphur hexafluoride, a greenhouse gas used as an electrical insulating material.

Sia Partners: management consulting firm specialising in strategy, business transformation, IT and digital strategy, and data science.

Smart grid: an electricity network using digital technology, flexibility of network users and two-way communication with them, and various other tools and technologies in order to maximise system efficiency and serve end users most effectively

SMART metrics: Specific, Measurable, Achievable, Relevant and Time-Bound objectives.

SME: small or medium-sized enterprise

Social Issues Expert Group (SIEG): Independent group of six experts that provides feedback to Northern Powergrid on how well its plan addresses social issues in the region it serves.

Social return on investment (SROI): a method for measuring values that are not traditionally reflected in financial statements, including social, economic, and environmental factors. They can identify how effectively a company uses its capital and other resources to create value for the community.

Socialise costs: spreading the cost of projects and works across all customers’ bills, whether or not those customers directly benefit from the work.

Solar PV: solar photovoltaics – solar panels.

Stakeholder: a party that has an interest in a company and can either affect or be affected by the business.

Stakeholder engagement: the identification of stakeholders, and communication and consultation with them for research and input – in the case of Northern Powergrid’s business plan, stakeholder engagement took the form of phone calls, panels, webinars, roundtables and surveys with a variety of stakeholders, from other utilities and local authorities to vulnerable customers and expert panels.

STEM: science, technology, engineering and mathematics.

Storm Arwen: extratropical cyclone that affected the UK, Ireland and France, bringing strong winds and snow from 25-27 November 2021, causing several fatalities and widespread, long-lasting power outages.

Stranded assets: the International Energy Agency (IEA) defines stranded assets as “investments which have already been made but which, at some time prior to the end of their economic life, are no longer able to earn an economic return”. In the RIIO framework, distribution assets may be stranded if they are properly built according to scenario analysis but become under used because the evolution of energy production and consumption differs significantly from the scenario analysis.

Substations: a key part of the grid, substations transform voltage from high to low, or the reverse, between electricity generating stations and customers' properties.

Technical Panel: independent panel of industry experts that scrutinised and challenged the technical aspects of Northern Powergrid's 2023-28 business plan.

Terms of Reference: document that sets out the working arrangements of the CEG, including its purpose, chair, membership, meeting schedule, level of administrative support, code of conduct, and dispute resolution processes.

Time-of-use tariff: tariff that better reflects the true cost of electricity based on the time, i.e., higher at peak times and lower at times when the demand is low.

Totex: ties together capital spend (capex) and operational spend (opex), over a long-term whole-of-life view of total expenditure (TOTEX).

Transmission Network Use of System (TNUoS): transmission network charges.

Treasury Green Book: guidance issued by HM Treasury on how to appraise policies, programmes and projects.

UK Energy Research Centre (UKERC): independent research centre into sustainable future energy systems.

Ultra-low or zero emission vehicles (ULEVs or ZEVs): low emission vehicle that emits 75g/km CO₂ or less.

Uncertainty Mechanisms: means of allowing price control arrangements to respond to change, protecting both consumers and licensees from unforecastable risk or changes in circumstances.

V2G: Vehicle to Grid - In which the electric vehicle supports the system, for example by exporting power to the grid

Volume driver: a numerical measurement, count, percentage, factor, or volume amount that impacts workload – a volume driver typically varies significantly over short periods of time.

Vulnerable customers: Ofgem defines vulnerability “as when a consumer’s personal circumstances and characteristics combine with aspects of the market to create situations where he or she is: significantly less able than a typical domestic consumer to protect or represent his or her interests; and/or significantly more likely than a typical domestic consumer to suffer detriment or that detriment is likely to be more substantial.”

Whole system: a cross-sector coordinated approach that incorporates more than the electricity system or energy system, but considers all sectors, industries, stakeholders and participants, joining up elements such as generation, transmission, distribution, buildings and customers with electricity, heat and transport, together with physical, digital and marketing systems, and policy.

Willingness to Pay (WTP): testing to discover the amount customers are willing to pay for a service or plan proposition.

Worst-served customers (WSC): Customers who experience more frequent and longer interruptions. Ofgem’s definition of worst-served customers for ED2 is those that experience 12 HV interruptions (power cuts) over a three-year period, with a minimum of two per year. This definition currently only includes power cuts where the fault was at high or extra high voltage.

If you would like to pose any questions to the CEG or find out more about how it is helping to ensure Northern Powergrid's future plans reflect the needs of the customers, stakeholders and the communities it serves, email ceg@northernpowergrid.com

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