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Sent via e-mail: *darren.jones.mp@parliament.uk*
Cc: Dame Margaret Beckett

16 December 2021

Dear Darren,

Electricity networks' response to Storm Arwen

Thank you for your letter dated 9 December.

Storm Arwen was catastrophic for nature, our communities and the electricity networks that serve them, and tragically resulted in the deaths of three people who were struck by fallen trees. Hurricane force winds flattened large areas of woodland, affected utilities, transport and damaged property and infrastructure.

As you are aware, the storm was particularly disruptive to those communities who were left without power when infrastructure became damaged. Despite the vast majority of the c1,000,000 homes affected by power outages being reconnected within the first 48 hours, the extent of the storm damage regrettably led to a significant number of people being without power for a prolonged period.

With storms becoming more frequent due to climate change – the Met Office lists 50 named storms to date since the start of the 2015/16 season, with a third of those occurring since 2019[1] – it has been clear for some time that continued investment and innovation in network resilience, and better working with local resilience forums to support communities during emergencies, is crucial.

Every DNO in Great Britain has committed to working with the Department for Business, Energy and Industrial Strategy and Ofgem on their respective reviews, as

[1] https://www.metoffice.gov.uk/weather/warnings-and-advice/uk-storm-centre/index

well as conducting their own internal reviews of the storm response. Our members will be happy to share the findings of these reviews in due course and once complete.

I have set out the answers to your specific questions below, detailing the resilience testing measures, reporting and investments our members make to manage and maintain the 821,000km lines and cables of electricity network in Great Britain[2]. Around 300,000km of the network length comprises overhead lines, which is the globally established standard for efficiently servicing the needs of rural and remote homes and communities.

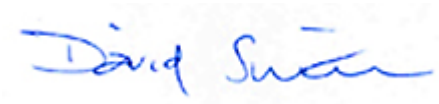
As you will see from the information I have provided, in the past five years the six GB DNO companies have spent around £12bn in measures that support increased reliability and resilience. Over the coming five years, this is forecast to increase by around 20% (subject to approval by the industry regulator, Ofgem).

I should note that, as regulated businesses, the requirements placed upon network operators, including requirements to invest in resilience, are developed and consulted on as part of the price control process led by Ofgem. Ofgem's intent in a price control is to balance the relationship between investment in the network with the amount that DNOs charge customers for operating their respective networks.

The scale of this incident is unprecedented and so I would like to use this opportunity to extend an invitation to you and other members of the Committee to visit a part of the network previously damaged by Storm Arwen. This will be an opportunity for you to see first-hand the scale of the operational challenge that was involved in reconnecting the communities our members serve, and to examine in person the work we do regularly to deliver safe, reliable supplies of energy.

I look forward to hearing from you.

Yours sincerely,



David Smith
Chief Executive

[2] https://www.ofgem.gov.uk/sites/default/files/docs/2018/12/ofg1050_riio_fast_facts_web.pdf

Appendix

(1) How do Distribution Network Operators (DNOs) conduct resilience or stress testing of their infrastructure?

There are various ways in which the electricity network and its component parts are tested to ensure resilience. Such measures include compliance with national and international standards, system testing, forecasting and regulatory reporting. For example:

- The network is developed and built to a common and agreed security of supply standard, known as National Standard for Resilience and Restoration (P2)[3] which is a standard license condition.
- A common framework exists across all GB networks for assessing, forecasting and reporting asset risk to the regulator. These are known as Network Outputs Methodology, supported by the Common Network Asset Indices Methodology (CNAIM) for DNOs and Network Asset Risk Metric (NARM) for the three Electricity Transmission Owners, National Grid Gas Transmission, and the eight Gas Distribution Networks.
- Cyber security testing is conducted through the EU Security of Networks & Information Systems (NIS) Directive which aims to raise levels of cyber security and resilience of key systems across Europe.
- Audit and compliance testing is conducted against internationally recognised standards such as ISO55000 (standard for asset management).
- Common Engineering design standards and recommendations for all different types of plant and equipment, such as cables, transformers and overhead lines[4], as well as agreed industry standards for tree cutting

In addition, the energy networks undertake annual emergency simulations ahead of winter to test industry emergency protocols. These took the form of Exercise Arctic (2019)[5], Exercise Baltic (2020)[6] and most recently, in September this year, through Exercise Celsius[7].

The emergency exercises are two-day events led by the Network Emergency Co-ordinator (a role fulfilled by National Grid) with participation from the Department for Business, Energy and Industrial Strategy, Ofgem, ENA, electricity and gas distribution network operators and others.

In addition, each DNO also completes their own internal winter preparedness checks.

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[3] https://www.ena-eng.org/ENA-Docs/Index?Action=ViewDetail&EID=99933&PEID=96477

[4] https://www.ena-eng.org/ENA-Docs/index?Action=Home

[5] https://www.nationalgrid.com/uk/gas-transmission/document/131031/download

[6] https://www.nationalgrid.com/uk/gas-transmission/document/136386/download

[7] Report not yet available. Overview available at https://www.nationalgrid.com/uk/gas-transmission/document/136391/download

(2) How often does this happen and when was the last such test for each DNO.

The reporting detailed above is published, reviewed and updated where necessary on a regular basis. The Network Outputs Methodology and Common Network Asset Indices Methodology are both submitted in line with price control (RIIO-ED1) regulatory reporting. Network companies also publish reports on their progress against and the status of their Long-Term Development Statement on a six monthly basis. The three annual emergency simulations which have been held since 2019 have their evaluation report published in the months after the exercise, with the most recent exercise being undertaken in September.

Inputs to these reports are driven by inspection and maintenance cycles which vary by individual asset category, are typically based upon:

- The criticality of equipment
- Manufacturer's recommendations
- Known failure modes
- Legal obligations

Each network company sets their own inspection and maintenance cycles based upon their own asset base and management approach.

In addition, the industry adheres to common resilience standards for example in relation to vegetation management, electricity system restoration or the flood defences of substations. These standards were developed to ensure that we meet our legal and regulatory obligations and support economic development of the networks.

(3) Are the results of any such tests shared with:

- **a. Ofgem;**
- **b. Government; or**
- **c. other operators?**

Yes, detailed information is shared with the regulator and made available in the public domain including on company websites.

Within the RIIO-ED1 framework all electricity distribution network operators were set risk reduction targets that each licensee must meet to avoid regulatory penalties. This is reflected within the annual Regulatory Reporting Pack of the Network Outputs Methodology submission operators make to Ofgem.

These reports incorporate all changes to asset health as captured through routine inspections and maintenance procedures. Network companies also publish annual stakeholder reports on performance against the target and forecast to the end of the period.

A significant proportion of information is made available publicly on company websites. This is publicly available in *Standard Licence Condition ('SLC') 50 ('Business Plan Commitment Reporting')* of the Electricity Distribution Licence which establishes the requirement for each DNO to publish a report detailing expenditure, delivered outputs and how it has performed against any commitments made in its RIIO-ED1 Business Plans. DNOs also publish Long Term Development Statements and Distribution Load Estimates on their websites. These are the tools which inform DNOs about what reinforcement is required on their networks to meet the relevant resilience standards.

Detailed analysis of faults and incidents is shared with the regulator and network companies. This analysis articulates the incident cause, the equipment affected and restoration stage data.

All technical and engineering standards are available online in a range of locations, including ENA's Document Catalogue[8]. From a distribution networks perspective, the Distribution Code[9] details the technical parameters and considerations relating to connection to, and use of, their electrical networks, and includes many of these standards. Some of those standards form part of the Distribution Code, the governance of which includes external stakeholders and Ofgem as the ultimate approval authority.

[8] https://www.ena-eng.org/ENA-Docs/

[9] http://www.dcode.org.uk

(4) How much investment has each DNO invested in the resilience of their infrastructure each year for the past five years?

Total resilience-related costs within price controls across all DNOs in the last five years totals **around £12bn**.

The *classifications* of expenditure applied are consistent across companies, since they are drawn from the regulatory cost allocations used by all the companies in their dealings with Ofgem. Any comparison of *levels* of expenditure between companies would need to take into account the differences in size, location and network design of the respective businesses.

Of this total, expenditure on Electricity System Restoration (formerly known as 'Black Start'), Quality of Service & North of Scotland Resilience, Flood Mitigation, Physical Security, Overhead Line Clearances, Tree Cutting accounts for **£1.2bn**.

All the values quoted in the table below are quoted on a constant price basis (2021 prices) in order to maintain consistency with information submitted annually to Ofgem and summarised in the Business Plan Data Tables submitted on 1 December 2021.

DNO	£m	2016/17	2017/18	2018/19	2019/20	2020/21	Total
Electricity North West	Resilience only* investment and expenditure	15	16	20	17	10	**78**
	Other Resilience-related** investment and expenditure	152	162	159	144	141	**758**
	Total Resilience-related investment and expenditure	167	178	179	161	151	**836**
Northern Powergrid	Resilience only* investment and expenditure	26	25	26	27	21	**125**
	Other Resilience-related** investment and expenditure	279	257	276	307	313	**1,431**
	Total Resilience-related investment and expenditure	305	281	301	335	334	**1,556**
SP Energy Networks	Resilience only* investment and expenditure	40	34	39	53	61	**227**
	Other Resilience-related** investment and expenditure	328	314	333	291	260	**1,526**
	Total Resilience-related investment and expenditure	368	349	372	344	320	**1,753**
SSE Networks	Resilience only* investment and expenditure	57	42	38	50	42	**228**
	Other Resilience-related** investment and expenditure	269	321	315	336	335	**1,577**
	Total Resilience-related investment and expenditure	326	363	354	386	377	**1,805**
UK Power Networks	Resilience only* investment and expenditure	31	37	46	50	37	**201**
	Other Resilience-related** investment and expenditure	452	474	447	444	431	**2,248**
	Total Resilience-related investment and expenditure	**483**	**511**	**493**	**494**	**468**	**2,449**
Western Power Distribution	Resilience only* investment and expenditure	102	90	67	66	63	**388**
	Other Resilience-related** investment and expenditure	708	566	527	560	638	**2,998**
	Total Resilience-related investment and expenditure	**810**	**655**	**594**	**626**	**701**	**3,387**
All DNOs	**Resilience only* investment and expenditure**						**1,247**
	Other Resilience-related investment and expenditure**						**10,539**
	Total Resilience-related investment and expenditure						**11,786**

*The resilience only figures include Electricity System Restoration (formerly known as 'Black Start'), Quality of Service & North of Scotland Resilience, Flood Mitigation, Physical Security, Overhead Line Clearances, Tree Cutting.
**Other measures that contribute to system resilience include measures such as planned and reactive asset replacement and refurbishment, reinforcement, repairs and maintenance, etc.

(5) How much investment does each DNO anticipate investing in the resilience of their infrastructure over the next five years?

We are awaiting Ofgem's final assessment of the business plans submitted by DNOs earlier this month which will confirm the allowed expenditure. This is due to be published as a Draft Determination in the summer of 2022.

Based on the business plans submitted to Ofgem, and subject to approval by the regulator, distribution network operators plan to spend **£14.5bn** over the next five years (2021/22 to 2025/26 inclusive) on measures to support resilience. Of this total, expenditure on Electricity System Restoration (formerly known as 'Black Start'), Quality of Service & North of Scotland Resilience, Flood Mitigation, Physical Security, Overhead Line Clearances, Tree Cutting accounts for **£1.2bn**.

This represents a proposed **19% increase** on the total resilience-related investment and expenditure in the previous five years (2016/17 to 2020/21 inclusive).

All values are forecast and provided as a direct comparable to the information provided in answer to Question 4.

(6) Please set out the reported profits and dividend payments of each DNO for each of the past five years.

It should be noted that all DNO Boards have Sufficiently Independent Directors (as required by their Licences) who are directly involved in approving company dividends.

The financial values in this table are nominal in the year of publication of the relevant audited accounts. The RAV may vary from that within the Ofgem submissions as a result.

Different ownership and company structures exist within the sector. As such, companies have different capital structures that take different approaches to funding their companies and meeting the requirement that the regulated entities retain investment grade status. Each company has presented figures based on audited statutory accounts that they consider best reflect the reported profits and the dividends that are paid to their owners associated with their DNO network businesses.

DNO	£m	2016/17 or 2016	2017/18 or 2017	2018/19 or 2018	2019/20 or 2019	2020/21 or 2020
Electricity North West	Net Profit	71.0	116.3	71.8	102.1	53.4
	Dividend	81.0	75.6	46.3	38.3	30.7
	RAV	1,696.0	1,758.0	1,820.0	1,896.0	1,948.0
Northern Powergrid	Net Profit	254.3	204.6	199.9	215.8	160.0
	Dividend	0.0	50.0	0.0	0.0	0.0
	RAV	2996.6	3135.0	3262.3	3373.7	3450.3
SP Energy Networks	Net Profit	236.6	188.1	188.4	204	166.5
	Dividend	95	166.3	168.7	141.9	165.9
	RAV	3401.7	3670.2	3838.3	3990.7	4085.3
SSE Networks	Net Profit	257.8	223.7	227.2	145.2	122.0
	Dividend	150.0	140.0	165.0	185.0	0.0
	RAV	3313.3	3461.7	3601.1	3721.3	3846.5
UK Power Networks	Net Profit	428.0	469.9	430.3	483.2	467.8
	Dividend	192.0	169.0	159.0	212.0	90.7
	RAV	5752.4	5981.7	6168.3	6334.3	6475.2
Western Power Distribution	Net Profit	727.7	611.7	638.7	587.4	587.5
	Dividend	245.18	420.2	98.0	189.0	80.3
	RAV	6974.7	7354.8	7697	7999.7	8330.5

(7) Please set out any regulatory or policy blockers affecting DNO investment in network resilience.

Network operators invest to deliver the existing standards for resilience. It is always legitimate to ask whether that standard should be raised further, especially considering the likely increase in severity and frequency of storms in the face of climate change. However, whenever those issues are considered, a balance needs to be struck between the costs involved in achieving a higher standard and the benefits of the incremental resilience.

This is not a decision networks and Ofgem can make without involvement from all stakeholders, including government and bill payers, all of whom have an interest in where that balance is struck. The primary means for this is a Price Control review, which is led by Ofgem.

As part of this process, DNOs work with their stakeholders to identify local needs and priorities, and Ofgem do the same at a national level. Stakeholders are invited to provide their views on the level of outputs proposed by network operators and their associated costs, which in turn set the targets and revenues for the network companies. This includes the resilience measures currently in place and any additional investment planned.

As well as funding for any incremental investment in resilience, network operators also need the necessary rights and powers to undertake work, which in some cases does encounter local objection despite it being in the interests of the wider community it serves. The existing package of measures does provide a workable basis for the companies but there is always opportunity to consider whether stronger powers would be of public benefit. Examples of this include tree cutting and the securing of the necessary access rights to carry out resilience investment.