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National Grid Electricity Distribution (NGED) is the Distribution Network Operator (DNO) serving South Wales, the Midlands, and the South-West of England. We serve over 20 million customers across over 550,000 KM<sup>2</sup>, making NGED the largest DNO by geography in England and Wales. Between 2023 and 2028, we are investing over £8 billion, including over £3 billion on new connections and network reinforcement, enabling the net zero transition.

NGED sits at the heart of Wales's energy system, connecting millions of people and businesses to the energy they use every day. Across South and West Wales, our team of over 1,000 people, based in 10 depots, maintains 36,000 km of overhead and underground lines, which distributes 10TWh of electricity to over 2million people.

The electricity distribution network is undergoing a fundamental transformation as the nature of demand and generation decentralises, with a rapid increase in the number connections associated small scale renewables, and the electrification of heat and transport, placing greater importance on our infrastructure. Similarly, at a time when the criticality of electricity network is increasing, we are experiencing more frequent, more extreme weather, such as Storms Bert and Darragh, which will continue to damage and affect continuity of service.

These twin factors highlight the need for a change in the way policymakers and regulators think of resilience, how it is achieved in an equitable manner for consumers, and how emergency responses are resourced and public expectations can be managed in extreme weather events.

We welcome the opportunity to engage with the committee on this important subject, and have provided further information in the below.

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### **Preparations and impact - Storm Darragh**

Storm Darragh was the most severe storm to hit the NGED network in decades— with 96mph winds and two rare red weather warnings affecting our region simultaneously in South Wales and the South West on 7<sup>th</sup> December. The rest of our region was also covered by amber warnings throughout the storm period and saw extensive flooding. In total, our network saw more than 9,000 faults. Faults is the term used to describe a malfunction on the network that can be caused by various factors, like storm-damaged cables/transformers, downed poles etc. In some of areas, we saw more than twice the number of faults experienced during Storm Arwen in November 2021.

The restoration effort was the biggest ever undertaken by our operational teams, with over 1,100 people mobilised to restore supplies. Given the duration of the storm, restoration work was hampered by land access issues, including flooding, debris and blocked roads, and also theft of our assets, like wooden poles and wire.

Our teams followed standard emergency planning protocols, working with local resilience forums across the region. Operationally, we followed our usual storm response protocol of readying our teams to make sure we could deploy as many people to the affected areas as fast as we could, when it was safe to do so in the face of the inclement weather.

## **Restoration and response:**

Our immediate priority in the aftermath of Darragh was getting as many people, as fast as we could, back on power as conditions allowed for the welfare of our teams. We look to restore power in the first instance by automatically switching the network where we can. If we are unable to do this, we look to fix the root cause of a fault if we can quickly and safely. Should this not be possible, we will undertake a temporary repair, with a view to permanently fixing the issue when conditions allow and the network is returned to business as usual. Lastly, we will use alternative supplies, like generators, where we can. However, these are a finite resource that need to be balanced against operational needs, as we also require the generators for our teams to undertake repairs, such as working through the night.

We also requested mutual aid from other distribution network operators, as well as redirecting teams from NGED's other licence areas as they returned to business as usual after the storm. Throughout the response to Storm Darragh, we had mutual aid teams from UK Power Networks, Electricity North West and Northern Power Grid deployed to the hardest hit areas in West Wales.

Of NGED's operational areas, our South Wales Licence Area was the hardest hit. That said, we were pleased that over 95% of supplies were restored within 24 hours (although there was a small number of properties without power for six days). This was in part large part thanks to the unprecedented restoration efforts of our operational teams, but also owing to the roll out of recent innovations, and learnings from previous storms. For instance, auto switching – which automatically reroutes supplies via other parts of the network (where possible) when faults happen.

Damage to the network was caused by a wide range of factors, including flying debris, wildlife and trees hitting overhead lines and felling wooden poles. Accessing and repairing these instances can also be affected by unforeseen factors – landowners withholding or delaying consent, the sheer scale of the clear up needed to get to the fault on our network, as well as assets, like wiring and poles, being stolen before our teams are able to get to the site as happened in a few places across our Welsh network. This was particularly the case during Storm Darragh, which was the biggest storm to hit our network in decades and resulted in around twice the number of faults on the network than during Storm Arwen.

## **Infrastructure resilience:**

Broadly speaking, the distribution network infrastructure is more resilient and was better prepared for Storm Darragh, than ahead of previous big storms, like Arwen and Eunice. Lessons were learned and action was taken to help increase the resilience of our network. A storm of the scale of Storm Darragh is, unfortunately by its nature, extreme, and was going to impact the distribution network significantly no matter how prepared or resilient the infrastructure.

Nevertheless, since Storm Arwen, we have invested around £8million in mitigating the damage caused by trees across our four licence areas. This is being achieved through a combination of undergrounding 11kV network in areas where it runs through trees and replacing cables with Aerial Bundled Cable. However, given the size of our network, this process will only have an incremental benefit as it runs over the course of its 20 year programme lifespan. The funding for this programme is delivered through our ED price controls, with only the first three years of it funded by the current ED2 settlement.

We have also invested around £13million adding more automation and technology to the 11kv network to help improve speed of restoration and the identification of the location of

faults. This automatic switching does reduce the time it takes to restore power and increase the overall resilience of the network. However, the sheer scale of damage and the volume of faults meant that, even despite the significant investments we have made, we still faced severe challenges. This programme is an 8 year initiative, with the first 3 years funded through the current ED2 price control.

As part of the Storm Arwen reopener, we did ask Ofgem for a further £15million for tree cutting, additional mobile generators, interconnectors and network mapping. However, Ofgem deemed these surplus to our needs.

We continue to invest in the health and resilience of our network, with £3.6billion in asset health and maintenance across our four licence areas, between 2023 and 2028. And we will of course enact the lessons learnt from Storm Darragh. However, without a total rewiring of the electricity distribution network, a storm of this scale, despite anyone's best efforts, is always going to have a significant detrimental impact on our infrastructure and continuity of service. This underscores the importance the response and restoration efforts and making sure they are the best they can be.

### **Customer Experience**

Our contact centres experienced unprecedented call volumes, at peak seeing 4,000 calls every 5 seconds, leading to longer wait times than usual. Over the weekend of Storm Darragh, we had a surge in 250,000 customer contacts, while we typically handle 1million customer contacts in a year.

Digital channels were utilised to help reduce inbound call volumes and allow customers to self-serve. Our power cut map saw a 3100% increase in use through the storm, our website saw around a 750% increase in traffic, and our storm advice webpage was visited by 2.5million people over the 7-8 December weekend – the equivalent of four months traffic in two days.

Customers were directly contacted by SMS and email and were able to access support and updates through the web and all social media platforms. Vulnerable customers had a direct dial number to the contact centre and other customers were encouraged to call 105.

Customers that were affected by prolonged outages automatically received payments that they were entitled to under Ofgem's Guaranteed Standards of Performance (GSOP), and we shared a broader claims form on our website and social media channels. All cheques were sent to affected customers in the days after the storm. Meanwhile, information about GSOP and claims remains available across all customer channels. In total, we made 46,000 guaranteed standards payments – 3.5 times as many as our previous largest storm – Eunice, in 2022.

### **Future preparedness**

Unfortunately, extreme weather is only becoming more frequent and we cannot hope that Darragh was a one off. As with every storm, there will be lessons to learn so we can prepare and respond better next time. This is still an ongoing exercise while we analyse, assess and implement changes. Emerging findings so far highlight the importance of:

#### **1. Automation**

- Automation of the network is key to efficient and effective operations and can help significantly when maintaining the network in storm.
- In Darragh, we saw significant amounts of automatic fault detection and switching taking place as the network looked to maintain reliability whilst faults occurred.

- This is an area we believe is only going to become more important, with our long-term aim of building and managing a network that can not only recognise it is ill, but that can then start to take steps to heal itself.

## **2. Reviewing Storm Severity**

- Looking at how storm severity can be more accurately assessed and what this means in terms of how we might operationalise responses in the future.
- In Darragh, we looked to restore customers at the earliest possible opportunity, which in some cases meant carrying out work while the storm was still having an impact.
- Assessing severity and anticipated duration might lead to different decisions about where we focus resources, where we look to patch the network, and where we look to carry out an immediate permanent repair.

## **3. Welfare and community communications**

- Darragh saw our largest welfare and community outreach of any storm in history, with 15 welfare vehicles deployed across impacted areas.
- The important role these provisions had on customers and communities were clear to see, providing a way for people to access warm food and drink, charging facilities, and information.
- Looking at how impactful these interventions were, we are looking at options to further expand our offering in this area, including dedicated storm volunteers.
- Some measures we are exploring for future storms:
  - Establishing dedicated Priority Services Register teams in the field, in addition to our charity partners' delivery.
  - Enhanced support for care homes
  - Provision of generators at community hubs, such as village halls, pubs, food/drink outlets.
  - Providing better online options for customers to reduce the volume of calls
  - Enhanced ramp up for resourcing in our customer contact centres

Ultimately, the electricity distribution network is incredibly resilient and operates at over 99% reliability – as an average, that equates to 30 minutes without power per household once every two years. We are constantly investing in the maintenance and resilience of our network, spending over £1bn every year. We have also learned from previous experience, using learnings from Storm Arwen to unlock additional investment in network resilience.

Our teams work hard to keep our network prepared, but the scale of Darragh was like nothing we have seen in decades. It was an extreme and severe weather event that, in parts of our network, caused twice the number of faults seen in Arwen. Despite this bigger impact, we were quicker to restore supplies and get customers back on - demonstrating our ongoing learning and evolution to storm response in the UK.