

Report

Interim report on the review into the networks' response to Storm Arwen

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Storm Arwen brought severe winds across the UK overnight on 26 to 27 November 2021, with the Met Office issuing a red warning for wind on the East coast of Scotland and North-East England on 26 November. Nearly one million homes experienced a loss of power because of Storm Arwen, with c.3,000 customers being off supply for a week or more.

This report provides a factual account of Storm Arwen's impact on the electricity network and its customers, and how the network companies responded to the event. It also provides an early indication of the areas that we will be investigating further to establish clear lessons for improvement, which will be published in the final report in Spring 2022. This report is an interim report based on the information available to date and we may wish to update or change our findings as our understanding of the events develops.

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Executive summary	4
1. Introduction	6
2. Assessment of the issues that arose.....	9
3. Network resilience.....	14
4. Planning and preparation	18
5. Handling of incidents	21
6. Communication and support during the incident	25
7. Ongoing support after the incident	29
Appendix 1 – Regulatory framework.....	32
Appendix 2- Supporting data	35

Executive summary

On the night of 26 November 2021, Storm Arwen brought severe widespread weather to the UK, with winds reaching up to 98mph in some parts of Northumberland. Nearly one million customers lost power, with c.3,000 customers being left off supply for over a week.

Losing electricity supply for long periods can cause huge disruption to people’s lives and livelihoods and considerable distress. The disruption impacted many aspects of people’s daily lives. As well as finding themselves without power and the ability to heat their homes, in some cases customers were also without water, communications and other services that are dependent on the power supply.

At the same time, staff in all electricity distribution network operators (DNOs) worked hard in challenging circumstances to get customers reconnected. Due to prolonged, high-speed winds, some DNOs experienced widespread and significant damage to the networks. Damage was mainly caused by high wind forces that snapped or uprooted trees that fell onto the overhead lines, ice accretion on overhead lines, and flying debris. Road blockages caused access issues with a large number of fallen trees.

In light of the severity of the event and the long duration without power that many customers endured, we have launched our review into the DNOs’ response to Storm Arwen. This review is distinct, but complementary, to BEIS and Scottish Government’s own reviews into the impacts of Storm Arwen, and lessons learned that could be used for improvements in network system resilience. A particular focus for our review is to determine whether there is any evidence that companies may have breached any of their statutory obligations or licence conditions, potentially leading to enforcement action. We have worked closely with BEIS and shared information to support both reviews.

In this interim report we provide a factual account of Storm Arwen’s impact on the electricity network and its customers, and how all the electricity distribution network companies responded to the event. We obtained information through our site visits, meetings with each company, information requests, correspondence from affected customers and MPs who wrote on their behalf.

Based on our review to date and the facts we have included in this report, amongst the issues that we will be exploring further. These are:

- **Companies’ investment in network resilience** - our data shows that companies are on track to have spent their ED1 allowances, but we need to explore further how that

spend has been targeted and what improvements were made to network resilience as a result. We plan to work with the industry to examine the costs and benefits of enhancing the resilience of overhead lines to severe weather events. We intend to use this evidence to inform the government’s wider work to develop the National Resilience Strategy.

- **Communications with customers** – It is clear that some customers experienced difficulties and delays contacting their DNO in the aftermath of the storm. We will be looking into the availability of phonelines and whether customer enquiries were dealt with in a prompt and efficient manner in accordance with DNOs’ licence conditions.
- **Deployment of generators** – DNOs differed in their approaches to deploying generators to temporarily restore customers’ power supply. We will be exploring best practice in the use of generators during storm events.
- **Accuracy of estimates time of restoration** – Customers’ experience of receiving accurate estimates of restoration varied. We will be exploring further the extent to which customers received an appropriate restoration time and how they were updated when the circumstances changed.
- **Communication and support for priority service register customers** - DNOs told us that they were proactive in contacting PSR customers before and during the incident to provide information, advice, and support. We will look more closely at the provision of this information and support in relation to DNOs’ licence obligations.
- **Speed of compensation payments** – All DNOs advised that they have made good progress with paying compensation to customers for whom they had records (advising that most were paid in December). However, it is taking considerably longer to identify and make payments to customers for whom DNOs do not hold records. We will be exploring causes of this and any improvements that should be made.
- **Review of the compensation cap** –We will be examining the compensation cap arrangements and whether they need to be amended for future potential storm events.
- **Roles and responsibilities of DNOs in severe weather** - We will work with the industry and wider stakeholders to establish clearer roles and responsibilities for the DNOs in supporting vulnerable customers during power outages, and their role in providing welfare support to the affected customers in severe weather situations.

Looking ahead to the publication of the final report in Spring 2022, we will be undertaking further analysis to establish clear lessons for improvement, including a programme of consumer research exploring the experiences of customers that endured a prolonged outage. We will also draw on evidence to determine whether the companies breached any of their statutory obligations or licence conditions, potentially leading to enforcement action.

1. Introduction

Chapter Summary

This chapter sets out the background to the review and the regulatory framework that electricity distribution network companies must comply with to protect consumers when their supplies are interrupted. It also sets out the next steps for the review and areas of further analysis that we will be exploring ahead of the final report in Spring 2022.

1.1. The purpose of this report is to provide a factual account¹ of Storm Arwen’s impact on the electricity network and its customers, and how all the DNOs responded to the event.

Background to the review

1.2. On 26 November, a red warning was issued by the Met Office as Storm Arwen brought severe winds across the UK. Tracking south from the north-east of the UK, winds were recorded at over 69mph, with the highest gust speed recorded in Northumberland at 98mph. In some areas, severe winds were accompanied by snow, ice, and rain. According to the Met Office, this was one of the most powerful and damaging winter storms of the last decade.

1.3. Around one million homes were affected by the storm, significantly impacting all DNOs except the three licence areas operated by UKPN. Many customers were restored reasonably quickly, with 85% of customers reconnected within 24 hours. The situation has been distressing for many who endured longer power outages, with c.3,000 customers off supply for a week or more.

1.4. We launched this review to establish what happened, understand how the DNOs performed in planning, preparing, and responding to the event and to make sure lessons are learned and changes are made that improve the situation of customers in future. We are considering whether there is any evidence that a network company may have breached

¹ Data presented in this report is based on the information shared by DNOs following an information request dated 16 December 2021, and any subsequent updates, where appropriate. Information provided by DNOs is subject to change following an audit of the initially reported data. To ensure consistency in presenting data, this report focuses on DNO companies rather than their individual licence areas.

any of its statutory obligations or licence conditions, and therefore if Ofgem needs to investigate that further, potentially leading to enforcement action.

Background to the distribution networks

1.5. The electricity distribution network carries electricity from the high voltage transmission network to industrial, commercial, and domestic users, as well as distributing an increasing quantity of power from generation sources that are connected directly to the distribution networks. There are fourteen electricity DNOs operating in GB, which are managed by six private companies.

1.6. As monopoly providers of an essential service, DNOs are regulated through price controls to ensure they deliver value for money, including significant investments that are needed to renew their assets, connect new generation, and keep the system safe and reliable. Price controls are a method of setting the amount of money (allowance) that can be earned by the DNOs over the length of a price control. DNOs recover their allowance from charges to energy suppliers, who in turn pass these costs through to customers through their energy bills. The allowances are set at a level which covers the DNOs’ costs and allows them to earn a reasonable return subject to them delivering value for consumers, operating efficiently, and achieving their targets as set by Ofgem.

1.7. Appendix 1 explains in more detail the various elements of the regulatory framework that are relevant to how companies perform during storms. These include:

- Guaranteed Standards of Performance (GSoPs), which specify minimum levels of service expected of DNOs. If a DNO fails to meet these, the affected customer may be entitled to a payment to compensate for the inconvenience caused by loss of supply.
- Interruptions Incentive scheme (IIS), which encourages DNOs to improve reliability of the network by setting targets for the number and duration of interruptions. If a DNO fails to meet these targets, they will face financial penalties and if they beat them, they will earn rewards. The level of the penalty or reward is calculated annually, based on the data they report to us as part of the annual iteration process.
- Safety and Security of Supplies Enquiry Service requires DNOs to operate an enquiry service at all times every day of each year. If a DNO fails to provide this service, they may be in breach of their licence conditions.
- Priority Service Register, which require DNOs to set up and maintain practices that identify customers who may be especially vulnerable during supply interruptions. If a DNO fails to provide this service.

Next Steps

1.8. We aim to conclude our review by Spring 2022, with the publication of our final report.

1.9. In the interim, we are continuing to gather and analyse information from the companies and wider stakeholders, including conducting our own consumer research. So far, we have identified several themes which we will be investigating further before drawing firm conclusions. One of the main themes is effective communication and accessible information, particularly relating to how the estimated time of restoration was communicated to customers. This is important as it enables customers to plan ahead and make choices based on how long they expect to be off supply. Other themes include the availability and deployment of working generators, timely and accurate compensation payments, and how quickly support was offered to those on the Priority Services Register.

1.10. We will also do further analysis to understand at a more granular level how resilient the electricity distribution networks and the DNOs themselves have been. This will feed into the development of our lessons learned and recommendations.

1.11. In each chapter of this report, we identify initial findings that will form part of our considerations for the lessons learned and recommendations of the review. At this point we do not rule any of them out and do not believe that they constitute a complete set of issues that we will be exploring further.

2. Assessment of the issues that arose

Chapter summary

In this chapter, we discuss the issues or problems that arose during and after Storm Arwen, what caused them and their impact on customers.

Weather conditions during Storm Arwen

2.1. On 25 November, the Met Office named Storm Arwen and announced an amber wind warning for North-East Scotland and England. This was raised to a red warning for wind on 26 November, with coastal areas to expect wind gusts in excess of 80mph. The rest of the UK was issued with an amber wind warning.

2.2. On 27 November, the Met Office Press office announced that Storm Arwen was abating with winds gradually easing, having recorded the top lowland gust at Brizlee Wood in Northumberland at 98mph. At this point there were still several severe weather warnings in force across the UK, however these had been downgraded to yellow wind warnings covering the majority of the UK until 6pm of that day.

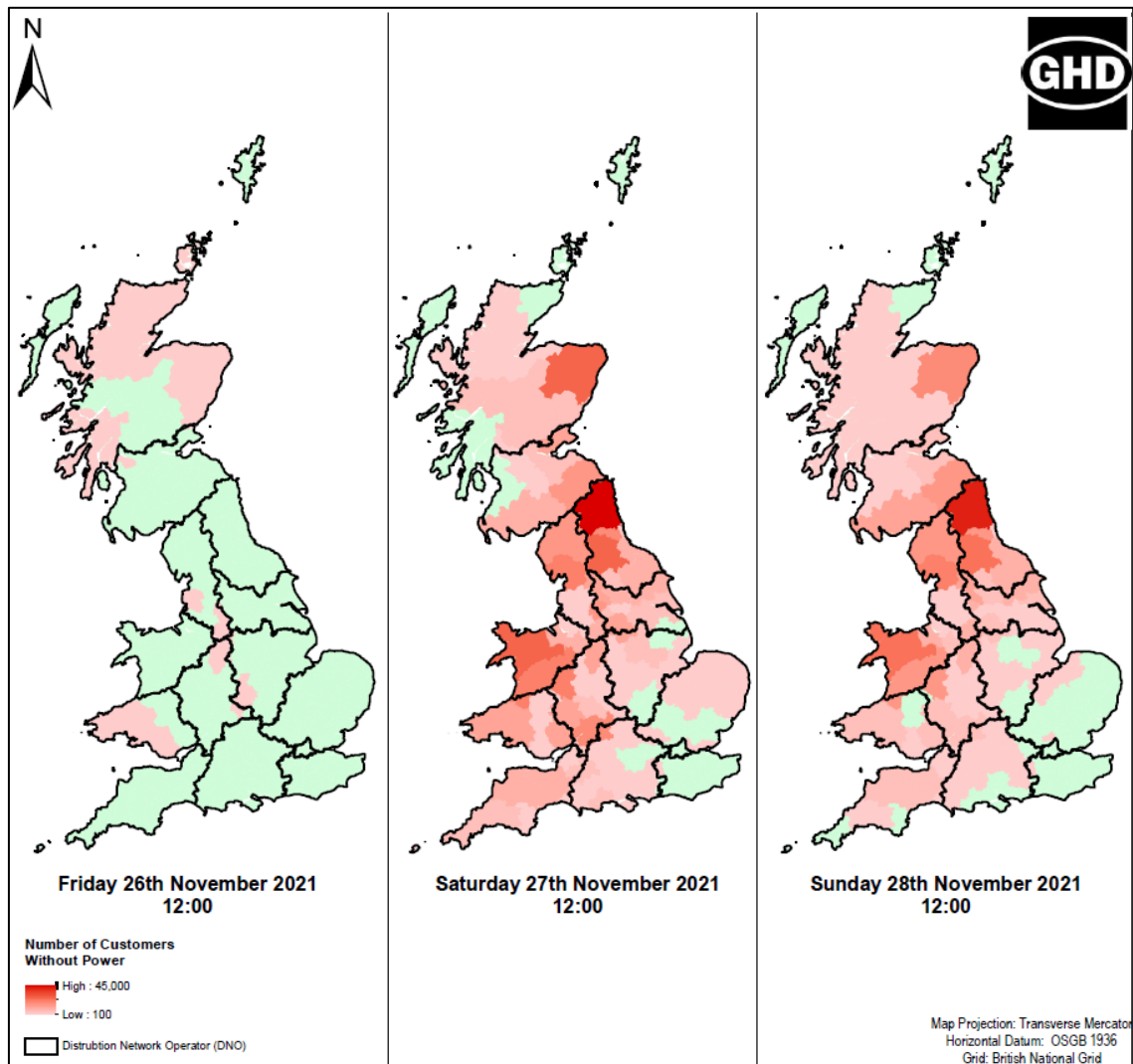
2.3. Overall, wind gusts reached 58 to 69mph widely across the UK, exceeding that in many exposed coastal locations. The wind was generally from a northerly direction. This was relatively unusual. The normal prevailing wind direction for the UK being westerly.

Damage to the network

2.4. The damage to the electricity distribution networks caused by Storm Arwen was primarily due to the fallen and broken trees, debris carried by the wind, and ice accretion on conductors. The extent of network damage is indicated in data received from the DNOs² in Figure 1 and Table 1 below.

² The data provided by the DNOs is subject to amendment as further fault analysis is completed.

Figure 1 – Storm Arwen outages maps



2.5. Electricity networks utilise various standardised voltages throughout GB³. As customer numbers/demand increases the amount of power needed to be transferred this requires higher voltages to be utilised. The highest voltage (33kV and greater) lines are designed to provide power to a large number of customers and are hence built to be more resilient than the lower voltage (20kV and below) lines. Higher voltage networks are generally supported with duplicated substation equipment and circuits to ensure that if one circuit is impacted by a fault, customers’ electricity supplies will be maintained through another. Therefore, it is an unusual occurrence for customers to lose electricity supplies through problems on the highest voltage networks. The aftermath of Storm Arwen saw a

³ 400kV, 275kV, 132kV, 66kV, 33kV, 20kV, 11kV, 6.6kV & 400V.

significantly higher number of faults to the 11kV & 20kV overhead lines compared to the low voltage (400V) overhead lines.

2.6. Nearly one million customers were affected by Storm Arwen. SSEN experienced the largest number of total faults (2,218), whilst NPg had the largest number of affected customers (280,867). Overall, there is little correlation between the number of faults, the subsequent number of affected customers, and ultimately the average restoration time. Further consideration of circumstances experienced by each DNO is presented in Chapters 4 and 5.

Table 1 – Extent of the electricity network damage⁴

DNO	Faults reported ⁵		Customers off supply
	HV	LV	
ENWL	244	120	74,983
NPg	493	724	280,867
SPEN	950	381	189,133
SSEN	1,759	459	143,749
WPD	859	783	243,930
UKPN	65	164	19,552

Ofgem engineering site visits

2.7. We visited the worst affected DNOs a week after Storm Arwen to gain first-hand understanding of the impact on the network, as well as how the DNOs were responding to the challenge. Our visits were to specific sites. Below we set out our account of what was seen at the sites.

2.8. We found extensive electricity network damage due to fallen or broken trees caused by exceptionally strong and sustained winds.⁶ A week on from the Storm, the evidence of road blockages was apparent with a large number of trees cut at the side of roads. The DNOs explained that they experienced difficulties gaining access to damaged networks during and immediately after the Storm.

⁴ The data was filtered to exclude outage causes that were not considered attributable to the Storm.

⁵ HV – High Voltage: >1kV, LV– Low Voltage: <1kV.

⁶ Where fallen trees were seen they were healthy in the main.

2.9. Issues of the northerly wind direction were particularly apparent in areas of commercial forestry. Entire leading edges of forests were felled, which then exposed trees internal to the plantations and causing them to fall in a cascade effect. Where overhead lines passed through plantations, even in well maintained cut corridors, the felled trees severed the lines.

Figure 2 - Deciduous forest damage (Ambleside, Cumbria)



Figure 3 - Coniferous forest damage (Kendal, Cumbria)



Figure 4 - 33kV pole bending under weight of fallen tree on conductors (Comrie, Perth and Kinross)



Figure 5 - Plantation felled & harvested due to wind damage (Lauder, Scottish Borders)



2.10. Generally, lines in open farmland showed no damage. This observation was not seen in Northumberland where exposed rural areas had significant damage due to the weight of ice accretion combined with high winds bringing down long sections of overhead line that have previously withstood typical storms over many decades.

Figure 6 - Pole damage from suspected line icing (Weardale, County Durham)



2.11. We noted the DNOs were restoring power to customers and reinstating/repairing damaged sections of the network. We observed that DNOs coordinated resources from multiple sources (DNO staff, contractors, NEWSAC resource). We saw several customer premises fed by generators. The customers that we engaged with on the ground were generally complementary of the DNOs’ staff but clearly concerned with the length of time some customers were still off supply. On our visits it was clear that additional resources were being employed by the DNOs, including resource from other DNOs via NEWSAC agreement, contractors, and, in one instance, non-GB resource.

Initial Findings

- Damage to the network was sustained through uprooted or broken trees falling on the overhead lines, ice accretion in some areas, and airborne debris.
- There was a significantly higher number of HV/LV faults compared to other storms of the last decades, indicating the strength and the unusual direction of the winds.
- Data alone shows little correlation between the number of faults, the subsequent number of affected customers, and ultimately the average restoration time for each DNO. Examination of DNOs’ level of preparedness and response to Storm Arwen needs to be considered alongside this data.

3. Network resilience

Chapter summary

In this chapter, we present our assessment of network investment and maintenance carried out by DNOs during RIIO-ED1 price control period.

RIIO-ED1 price control funding

3.1. We have provided £29.5 billion⁷ of funding through the current electricity distribution price control (called RIIO-ED1) for DNOs to operate, maintain and enhance the electricity networks, while meeting the needs of consumers at value for money.

3.2. This includes £3.9 billion of spending on maintaining asset health (including through the replacement of ageing assets); and specific funding of £1.5 billion for key network resilience areas. This latter funding covers flood protection and physical security at key sites; ensuring sufficient capability is in place to restore the network in the event of a total failure of the electricity system; and the protection of overhead lines (for instance, by managing trees and vegetation that are close to overhead lines).

3.3. Detailed Regulating Reporting Packs (RRPs) are submitted annually by all DNOs to monitor progress to planned investment against the ED1 allowances. To date, DNOs have spent 99.2% of their allowance, with some DNOs overspending against their allowance.

Overhead line construction standards

3.4. Overhead lines are designed to withstand a range of mechanical influences applied to them during their operation. These influences come from the weight of the conductor and other apparatus installed on the wood poles, as well as weather-related forces, such as wind, ice loading, and temperature. Once these factors have been taken into consideration, a factor of safety is also applied to ensure that the line and its supports are resilient to unforeseen events. The topography, altitude and geographical features of the line route will also be factored into the design of span lengths.

3.5. The effect of wind on a wood pole in isolation is insignificant due to its shape. A vertical pole presents a small cross section to the wind which results in a small force being

⁷ 2020/2021 price base.

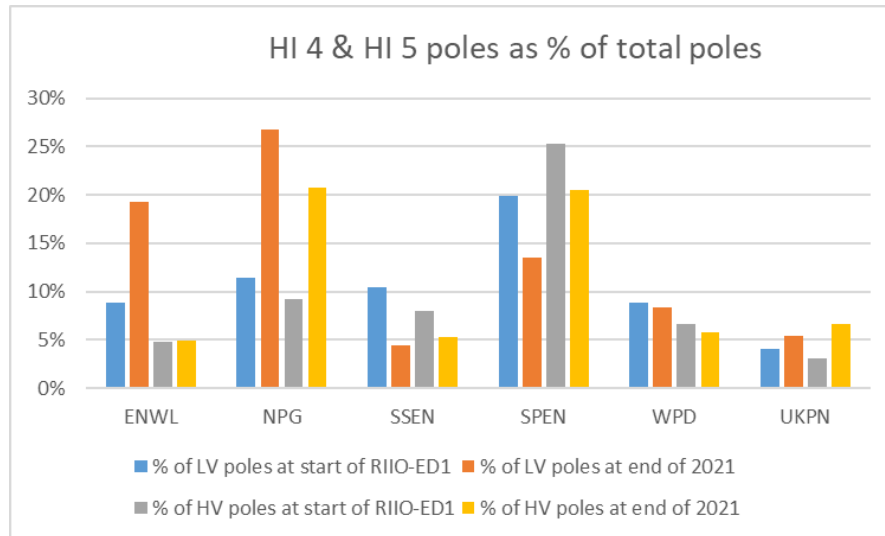
applied to the pole. However, the resistance to wind comes mainly from the equipment attached to the pole and most significantly the conductors. This is exacerbated if those conductors then become covered in a layer of ice, which presents a greater area of wind resistance and increased weight on both the conductor and the pole. The resistance to wind is also dependent on the direction of the wind, with a cross wind imposing the greatest force. Overhead lines are designed to certain levels of force which include wind resistance due to ice accretion on conductors. If the amount of force being applied to either conductor or pole is too great the conductor or the pole will snap.

3.6. Although the current construction standards require poles to have larger blocks bolted to them to provide additional anchorage and improved stability, prior to 1980s poles were generally installed directly into excavated holes without any additional support. In 1988 the building standard was revised to deliver greater resilience by introducing stronger poles, shorter spans, and improved foundations. This standard has been successively developed and is used by all companies in the UK.

3.7. In RIIO-ED1, we require DNOs to report information relating to both Asset Health⁸ and criticality. This information is known as the Network Asset Indices and provides an indication of the risk of condition-based failure of network assets. Poles with HI 4 and HI 5 banding indicate a higher probability of failure and need to be closely inspected to assess condition and whether replacement is required. Figure 7 below shows that some DNOs have seen a significant increase in HI 4 and HI 5 poles between the start of RIIO-ED1 (April 2015) and the end of 2021. We are exploring further whether this was a contributing factor to the extent of the network damage because of Storm Arwen.

⁸ Asset Health represents the condition of an asset measured against a common set of condition factors and is reported against five Health Index (HI) bands, with HI 1 representing a new healthy asset, and HI 5 representing an unhealthy asset at the end of its useful life.

Figure 7 - HI 4 and HI 5 poles as a % of the total poles



Overhead lines vs underground lines

3.8. The UK electricity supply industry greatly expanded the network of overhead lines in the 1950s and 1960s under the Rural Electrification programme. This expansion programme, which extended to a lesser degree throughout the 1970s, effectively laid down the blueprint of the UK overhead line network population for electricity companies, including design, construction, material, and maintenance standards.

3.9. Overhead lines continue to be generally selected as the use of underground cables can be prohibitively expensive, considerably slower to install and, due to the extended distances to remote areas, technically impracticable.

3.10. In addition, faults on overhead lines are generally visible and can, under normal circumstances, be quickly repaired. Faults on underground cables are much more difficult to locate, excavate, repair and test before re-energising.

Maintaining overhead lines for vegetation

3.11. Both landowners and DNOs have a responsibility to ensure that vegetation, including trees, is managed in such a way that clearances to overhead lines are maintained. Whilst each DNO has a different level of tree population surrounding their overhead lines, all employ a similar strategy to maintaining clearances based on industry standards and legislation. This includes cyclic inspections of their overhead networks over periods of typically 3 or 4 years.

3.12. For RIIO-ED1 we provided DNOs with £1,038m of funding to manage the network risk associated with trees. This includes tree cutting for safety reasons, as well as tree clearance for network resilience, i.e. to prevent trees and other vegetation falling onto overhead lines and causing power outages. To date, DNOs have spent £731m and are on track to spend £981m by the end of the price control. We will be exploring further how that spend has been targeted as part of the review.

Table 2 – RIIO-ED1 allowance vs year to date spend on tree and other vegetation management (£m, 2020/21 prices)

	ENWL	NPG	SPEN	SSEN	WPD	UKPN	Total
RIIO-ED1 Allowances	41.8	89.2	166.8	193.9	326.9	219.2	1037.7
RIIO-ED1 YTD	28.0	57.0	89.4	155.5	307.1	93.8	730.8

3.13. Due to the nature of rural geography and topography, it is inevitable that the path of an overhead line will pass across exposed areas of countryside. It is equally inevitable that lines will run adjacent to and at times through, wooded areas. These plantations may not have been mature when the overhead line was first constructed and as such presented no risk to the integrity of the poles and conductors. However, as the trees develop over many years, they may begin to present a hazard.

Initial Findings

- We plan to work with the industry to examine the costs and benefits of enhancing the resilience of overhead lines to severe weather events. We intend to use this evidence to inform the government’s wider work to develop the National Resilience Strategy.
- Some DNOs have seen a significant increase in poles requiring replacement between the start of RIIO-ED1 (April 2015) and the end of 2021. We are exploring further whether this was a contributing factor in the extent of the network damage because of Storm Arwen.
- Spending on maintaining vegetation near overhead lines is in line with RIIO-ED1 allowances for all DNOs. We will be exploring further how that spend has been targeted.

4. Planning and preparation

Chapter summary

In this chapter, we provide an overview of our assessment into how well prepared the network companies were for Storm Arwen.

Emergency plans

4.1. All DNOs have emergency plans to manage the response during severe weather conditions. These plans have sub levels relating to weather warnings from the Met Office and other weather forecasters, which are used to inform what additional resources need to be mobilised with the skills to identify and repair faults.

4.2. All DNOs advised that they have managed the planning and response to Storm Arwen utilising their emergency plans, which were informed by the actions and lessons learned from previous storms. Using weather forecasts, DNOs advised that they implemented their pre-incident escalation on 24 November, with internal preparations, communications to staff, customers, and external stakeholders. All DNOs explained that they were actively communicating with other DNOs through the NEWSAC arrangement, during which they identified their requirements for resource or their ability to provide resource.

4.3. Table 3 below shows the number of contact centre staff working during the Storm, which on average is lower than staffing levels provided for the 2013 winter storms.

Table 3 – Contact centre staff numbers

	26.11	27.11	28.11	29.11	30.11	1.12	2.12	3.12
ENWL	18	39	89	123	101	137	90	89
NPg	90	73	115	236	217	222	214	125
SPEN	41	83	72	269	210	268	121	47
SSEN	75	99	111	110	107	102	89	73
WPD	134	182	174	204	157	117	111	110
UKPN	-	80	82	-	-	-	-	-

4.4. In the early stages of a storm, the crucial importance of the call centres is to receive incoming calls notifying loss of supply and damage reports from the public. Although the higher voltage systems have monitoring and communications to control centres to notify of circuit breaker trips, LV networks do not have any means of communicating loss of supply where LV fuses operate. Therefore, the incoming calls and contacts are the means whereby companies know they have faults in the areas until engineers can survey the network for damage.

Winter preparedness plans

4.5. In 2021, we wrote to all DNOs on two occasions to understand the preparedness plans companies had in place to support customers in vulnerable situations over the winter period. Companies’ winter preparedness programmes largely focused on campaigns which aim to raise awareness of the PSR and the range of support available to registered customers, as well as ensuring customers are as prepared as possible, including having awareness of the 105 emergency faults telephone number.

4.6. In terms of power cut support in the event of unplanned outages, companies noted a range of support through communication services, including proactive outbound calling and a dedicated PSR helpline; the power cut support services, such as generators; hot food provision; winter welfare packs; and support vehicles. We will be examining further how effectively DNOs’ winter preparedness plans were implemented during Storm Arwen.

Availability of staff

4.7. All DNOs advised that they maintained good level of resource deployment to handle incidents, with most DNOs experiencing a peak in resourcing numbers around 29 November when resources under the NEWSAC agreement were released. DNOs also called on contractors to provide support.

4.8. On average, DNOs deployed more resources when compared to the 2013 winter storm handling.

Table 4 – Resource deployment

		26.11	27.11	28.11	29.11	30.11	1.12	2.12	3.12
ENW	DNO Staff	112	229	254	402	427	419	422	325
	Contractors	20	33	112	128	155	149	148	140
	NEWSAC	0	0	14	87	104	110	129	126
NPG	DNO Staff	194	982	1016	1275	1259	1242	1236	1187
	Contractors	0	63	63	66	52	66	69	69
	NEWSAC	0	0	10	101	106	131	131	145
SPEN	DNO Staff	271	404	427	519	532	476	411	388
	Contractors	136	156	211	363	346	403	379	351
	NEWSAC	0	0	27	49	137	123	123	109
SSEN	DNO Staff	880	377	340	557	317	318	363	338
	Contractors	44	117	162	140	167	186	186	150
	NEWSAC	12	12	23	12	77	87	86	137
WPD	DNO Staff	743	1188	1129	1310	468	398	0	0
	Contractors	49	158	166	152	26	26	0	0
	NEWSAC	0	0	0	0	0	0	0	0
UKPN ⁹	DNO Staff	0	220	124	0	0	0	0	0
	Contractors	0	0	0	0	0	0	0	0
	NEWSAC	0	0	0	0	0	0	0	0

Initial Findings

- All DNOs were aware of the weather forecast ahead of Storm Arwen and actioned their emergency plans promptly.
- All DNOs had winter preparedness plans for vulnerable customers; however, further examination is required to conclude whether they were carried out effectively during Storm Arwen.
- On average, DNOs deployed more resources when compared to the 2013 winter storm handling.

⁹ UKPN licence areas were not impacted by Storm Arwen.

5. Handling of incidents

Chapter summary

In this chapter, we explore what the network companies did to deploy resources to deal with problems caused by Storm Arwen, including speed and effectiveness of repairs, management oversight and governance, distribution of generators, and accessing resource support from other companies.

Working conditions

5.1. The DNOs advised that the duration and severity of the Storm impacted the length of time it took to be able to get staff in place to either repair or provide an assessment of damage, which hampered the initial response. The DNOs advised that staff were faced with the following working conditions, to varying degrees:

- Sustained winds above 60mph for approximately 24 hours, during which time DNOs would expect network damage to occur. It took a further 12 hours for winds to subside to a level that staff were able to safely work at height. It was not until 28 November that helicopters could be safely deployed to assess the damage.
- Blocked roads by fallen and broken trees, and snow in some parts of the country. In some areas, access through both main and minor roads was blocked.
- Short duration of daylight, with sun rising after 8am and setting before 4pm.
- Damage to the telecommunications networks resulted in some staff not being able to report on the damage they have assessed or to receive switching instructions. In some instances, staff had to drive up to an hour each way from the work site to gain mobile phone signal.

Approach to repairing faults

5.2. DNOs utilise sophisticated automatic equipment that allows the high voltage network to be reconfigured to maintain supplies to customers. When damage to the network is permanent (e.g. from a fallen tree on an overhead line), DNOs typically will prioritise these faults because there will be more affected customers compared to the low voltage faults. They will identify critical customers (such as those with medical devices or customers that provide services to wider society, such as water pumps or mobile communication providers) on their systems and prioritise these for repair if they can. They will then work down the

faults until they are working on the low voltage system. Low voltage faults will typically be tackled last because of the relatively few customers impacted by such fault.

5.3. Some DNOs advised us that Storm Arwen presented significant number of faults which were not immediately apparent. As repairs and inspections progressed the number of faults increased significantly as they were hidden behind other faults. These faults are talked of as being nested behind these higher voltage first faults. They can be difficult to find initially and rely upon either visual inspection, calls from customers of damage, or finding them because of higher voltage repairs.

5.4. DNOs adopted different options to resupply affected customers, including repairing the network and using emergency power, like generators. In the first instance, repairing the network was the preferred course of action for all DNOs, as carrying out this work had a more enduring impact on the network and would generally benefit a larger number of customers. As the time that customers were off supply drew out, all DNOs used generators.¹⁰ Table 5 below shows the average number of generator units deployed per day of the Storm Arwen restoration period by each DNO.

Table 5 – Average generator units deployed per day during outages

	ENWL	NPg	SPEN	SSEN	WPD	UKPN
Average generators deployed per day	73	139	157	49	36	2

5.5. There were no reported issues in DNOs accessing generators, as they own some themselves and then supplement this with pre-agreed hire contracts with multiple suppliers. However, DNOs adopted different strategies to using generators, with some adopting generators solution earlier and on a wider scale than others.

5.6. Some DNOs have told us that there are trade-offs between using staff to connect generators and repairing the network. Once the generator is on site, and in the correct position, it needs to be safely connected. This requires on average two field services engineers to make the connection. Field services engineers are a limited resource during a storm event and using them to install generators can have a significant impact on the wider restoration effort, especially where this diverts resources from fault finding and repair

¹⁰ Generators are units that produce electricity using diesel engines. Generators vary in size. The most readily available portable generator type is approximately 50kVA, weighing around 1,000kg and measuring 2m long by 1m wide. They are substantial pieces of equipment that need to be transported on a trailer. They can serve approximately up to 10 households.

activities. However, some DNOs were able to install generators using jointers so that field services engineers were not diverted from fault finding and repair activities.

5.7. In addition to providing staff to install generators, there is also a significant staff requirement to maintain a large fleet of generators. This includes refuelling them when needed (on average every two days) and restarting them should they trip.

Pace of repair

5.8. Nearly one million customers were affected by Storm Arwen. The majority of customers (85.3%) were restored within 24 hours. However, 1.4% of affected customers (32,461) were left without power for more than 3 days. We consider this to be a significant number of customers to be off the power supply for such a prolonged period of time, in particular during the winter conditions. For comparison, during the 2013 Christmas storms, only 0.8% of affected customers (7,448) were left without power for more than 3 days.

Table 6 – Cumulative number of customers off supply

DNO	Less than 24 hrs	1+day	2+ days	3+ days	4+ days	5+ days	6+ days	7+ days
ENWL	74,983	29,249	8,408	4,812	2,602	1,436	443	196
NPg	280,867	45,900	22,046	13,796	8,792	5,717	4,094	2,537
SPEN	189,133	23,885	8,238	2,592	1,114	474	106	0
SSEN	143,749	32,476	19,272	11,235	6,638	3,741	1,101	299
WPD	243,930	8,214	1,137	26	1 ¹¹	1	1	0
UKPN	19,552	22	0	0	0	0	0	0

5.9. When comparing DNOs’ restoration times, WPD and SPEN were the first DNOs to restore all of their affected customers by day 7.12 At that point, 0.1% of customers (3,032) remained off supply.

¹¹ For the remaining customer off supply (a grain drying barn), WPD required access to the premises, which were not immediately granted.

¹² UKPN’s customers were restored under the normal conditions, as Storm Arwen did not have the same impact on their licence areas compared to other DNOs.

NEWSAC arrangement

5.10. NEWSAC (North East West South Consortium) is a group set up to provide support during emergencies. Resources, such as manpower, vehicles, materials can be provided by any of the DNOs where one or more are impacted by an extreme event or an emergency. This was triggered by SSEN on 23 November with the potential requirement for resources needed. By the 24 November, contractors were being contacted to provide availability.¹³ On 25th November, all DNOs held a NEWSAC call to highlight concerns and to discuss potential resource requests.

5.11. As the Storm passed, DNOs least affected (i.e. UKPN, and WPD) released resource, both direct employees and contract resource, as early as 28 November. In some instances, DNOs that were least affected (e.g. UKPN) fielded calls from DNOs that were more seriously impacted (e.g. NPg). This is a relatively new aspect utilising call centre resource and facilities to aid other DNOs.

5.12. Overall feedback from all DNOs is that they were satisfied with how the NEWSAC agreement arrangements worked.

Initial Findings

- DNOs experienced difficulties in assessing the level of damage and carrying out repairs in the first 48 hrs due to the persistence of high winds, blocked road access and the need to remove significant numbers of fallen trees to access the lines.
- The use of emergency power (generator sets) varied between different DNOs. This is something that we will be exploring further as part of the review.
- Majority of affected customers (85%) were restored within 24hrs of the power interruption occurring. A significant number of affected customers (c.32,461) remained off supply for over 3 days.
- NEWSAC agreement worked well, with DNOs that were less affected (UKPN and WPD) sending initial resources to the other DNOs as early as 28 November 2021. Further consideration should be given to whether the NEWSAC agreement could include contact centre staff.

¹³ As all DNOs were doing this, the resource available through contractors had to be shared by the DNOs. This may have delayed the deployment of contractors to the worst affected areas.

6. Communication and support during the incident

Chapter summary

In this chapter, we look at how well the network companies communicated with customers and stakeholders during Storm Arwen, in particular customers in vulnerable circumstances.

Customer communications

6.1. Prior to the Storm, DNOs issued proactive customer warning communications (in some areas at least a day before) and set up Storm warning webpages on their websites giving advice on what to do in the event of a power cut, safety and how to register for the Priority Services Register (PSR). Press releases were prepared prior to the Storm to provide customer information and were used throughout the storm.

6.2. DNOs applied a wide range of communication methods across a variety of media to provide available information to customers. Companies used traditional communication methods, such as outbound telephone calls and e-mails, together with social media updates and postcode specific text messages. DNOs also engaged with the media to provide both press releases, local and national television interviews and provide information on local radio. MPs and local councils were also engaged to disseminate information.

Handling customer enquiries

6.3. In the aftermath of the Storm, the DNOs experienced a significant spike in the volume of calls from members of the public (as shown in Table 7 below). From 26 November until 3 December, ENWL, NPg, SPEN, SSEN and WPD experienced more than 500,000 calls combined. Over 40% of these calls were made on 27 November alone.

Table 7 – Contact centre data for period 26 November to 3 December

DNO	Total calls taken	Min average time to answer by an agent (sec)	Max average time to answer by an agent (sec)	Total abandoned calls	% abandoned calls
ENWL	77,223	7	2,054	8,177	11%
NPg	64,337	7	6,408	27,859	43%
SPEN	137,813	4	948	33,171	24%

DNO	Total calls taken	Min average time to answer by an agent (sec)	Max average time to answer by an agent (sec)	Total abandoned calls	% abandoned calls
SSEN	123,858	0	2,808	16,891	14%
WPD	98,745	2	565	14,848	15%
UKPN ¹⁴	2,016	2	4	5	0.2%

6.4. We intend to investigate and assess the availability of phonelines and whether customer enquiries were dealt with in a prompt and efficient manner in accordance with DNOs’ licence conditions. We are interested in comparing the performance of each DNO and understanding why call abandonment rates were so erratic across the industry. In addition, we will be looking into how and whether companies used customer call backs to keep their customers informed.

Estimated Time of Restoration (ETR)

6.5. DNOs adopted different approaches in communicating ETRs to the affected customers. For example, ENWL advised that they did not give customers an ETR on 26 November; rather they stated they would provide ETRs on 27 November once the storm had passed. ENWL instigated ETR updates three times each day from 27 November. From 29 November onwards ENWL sent updates to say that power could be off until 4 December but in addition contacted individual customers to give more detailed information by postcode area. NPg advised that they issued automatic ETRs from 26 November until 30 November, when they moved to giving ETRs based on postcode data.

6.6. The experience of receiving accurate ETRs varied for customers. We understand that some customers that were in the tail end of the restoration schedule were disappointed to not receive accurate ETRs sooner, as it would have informed their decisions about seeking alternative accommodation for the duration of the outage.

6.7. We will be reviewing further when and how DNOs advised customers on their ETRs and how those were updated when the circumstances changed.

¹⁴ Data for UKPN covers period 27-28 Novembers, reflecting the fact that UKPN licence areas were not significantly impacted by Storm Arwen.

Additional support during the incident

6.8. All DNOs provided additional support to the affected customers in the form of hot meals, meal vouchers, food compensations schemes, and hotel rooms. In total, over 190,000 hot meals or meal vouchers were issued by the DNOs to customers. Over 1,400 households were also provided with alternative or hotel accommodation during the outage.

Communication with vulnerable customers

6.9. Under their licence obligations, DNOs are required to ensure that during an unplanned interruption of supply to their premises, PSR customers are promptly notified and kept informed of the time at which the supply is likely to be restored, and of any help that may be able to be provided in the meantime. All DNOs advised us that they prioritised outbound calls with PSR customers during the Storm and had a queuing system for the inbound calls that gave PSR customers priority. Some deployed staff and external agencies to visit PSR customers at their premises if they were not able to reach them over the phone or if they were off supply for a prolonged period of time.

6.10. We plan to look more closely at how DNOs met their licence obligations to maintain and update their PSRs, and provide information, advice, and support to customers on the PSR before and during the incident.

Local Resilience Forums (LRF)

6.11. Most of the DNOs proactively engaged with their LRF contacts prior to the Storm during the planning and preparation phase, to ensure there was knowledge of the potential impact of the Storm on power supplies. A number of DNOs engaged with their LRF contacts regularly as part of business-as-usual engagement.

6.12. During the Storm, most DNOs worked collaboratively with LRFs to coordinate support. DNOs advised that they used LRFs for the purposes of providing support to vulnerable customers and those who would be off supply for the longest period of time. Specific examples of this include partaking in prioritised door knocking to ensure customers received welfare packages and hot food and drinks, working together to mobilise tree cutting resources and machinery, and empowering LRFs to issue hotel rooms for customers who needed alternative accommodation.

6.13. DNOs had different experiences when working with LRFs. Some claimed it was the best approach to targeted, local support, whereas others were not able to access comprehensive data via LRFs.

6.14. Under the Civil Contingencies Act 2004 (the CCA),¹⁵ DNOs must cooperate with local authorities, emergency services, and health services by providing information necessary for the performance of their functions under the CCA. As far as reasonably practical, DNOs must be a part of a forum of all relevant LRFs, to respond in a coordinated manner to the emergency. In the context of Storm Arwen, BEIS and Scottish Government have highlighted the need to make improvements with regards to the information shared between DNOs and LRFs, and the roles and responsibilities between DNOs and LRFs during severe weather events. We will work with the industry and wider stakeholders to establish clear roles and responsibilities for the DNOs in supporting vulnerable customers during power outages, and their role in providing welfare support to the affected customers in severe weather situations.

Initial Findings

- DNOs showed a range of experience in handling customer calls, with the call abandonment rate at 43% for NPg compared to 11%- 24% for other DNOs.
- Customers’ experience of receiving accurate ETRs varied amongst DNOs. We will be exploring further the extent to which customers received an appropriate restoration time and how they were updated when the circumstances changed.
- DNOs told us that they were proactive in contacting PSR customers before and during the incident to provide information, advice, and support. We will look more closely at the provision of this in relation to DNOs’ obligations.
- We agree with BEIS and Scottish Government that the roles and responsibilities of DNOs in providing welfare support to the affected customers could be made clearer. We will work with the industry and wider stakeholders to establish clearer roles and responsibilities for the DNOs in in severe weather situations.

¹⁵ The CCA provides a framework for civil protection activity across the UK in the event of an emergency, which includes events related to a disruption of supply of energy.

7. Ongoing support after the incident

Chapter summary

In this chapter, we discuss the speed and effectiveness of the network companies in making compensation payments to the affected customers.

GSOPs compensation payments

7.1. The GSoPs that we set out in Chapter 1, cover 12 key service areas, including supply restoration when there is a power cut. If DNOs fail to meet the level of service required, individual customers are compensated for any long outages. For severe storms such as Arwen, if the networks do not restore power to a consumer within 48 hours, they must pay £70 in compensation; and this increases to £140 per day for each successive day.

7.2. For those customers on the Priority Services Register, power failure compensation claims should start automatically without any action by the customer, however this relies on the DNOs having up-to-date information within their PSRs.

7.3. There is a cap of £700 on such compensation, but in response to storm Arwen, DNOs agreed to lift the cap so that customers are fully compensated for the outages they have endured. We agreed the following four-part approach with the DNOs to facilitate efficiency in handling payments:

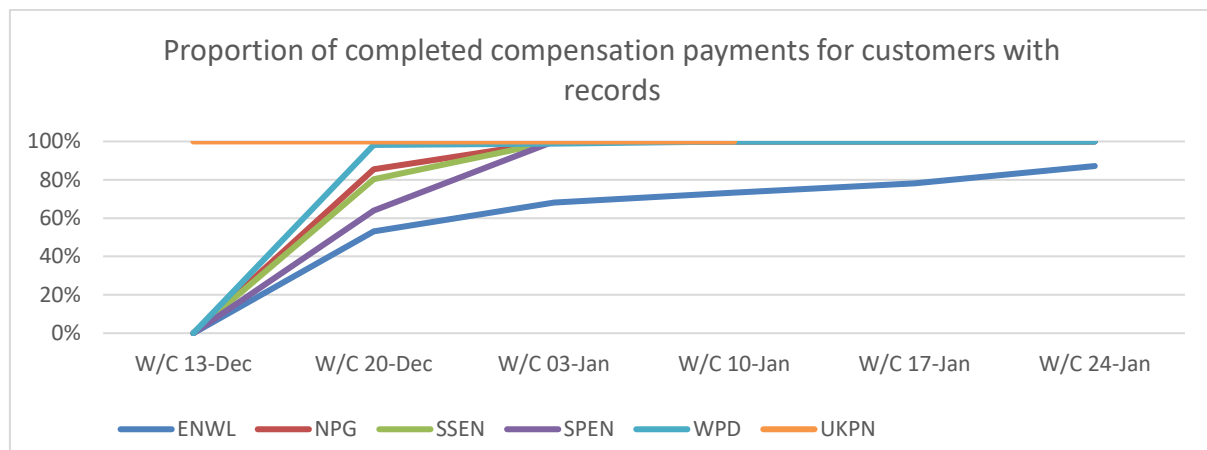
- Companies would proactively and clearly communicate across all appropriate channels to ensure customers understand what compensation they are entitled to.
- They will immediately process and pay without delay the compensation for all affected customers for whom the network already holds the appropriate records in terms of names and addresses.
- For any customers for whom records are not clear (for instance, those that are unlisted or listed as unnamed occupiers in premises), network companies will proactively identify such customers, and then immediately process payments for them without delay. They will work with local authorities and other partners where appropriate to identify any such customers that are not identified on their systems.
- There would be no detailed application process for any customers, with only minimal checks where absolutely necessary to ensure the accuracy of all compensation payments made.

7.4. In addition to lifting the £700 cap on compensation payments, all DNOs advised that they made additional forms of voluntary payments to affected customers.

Customers for whom DNOs have records

7.5. There is a process in place allowing customer contact data to be transferred from suppliers to DNOs to aid customer communication during disruptive events. Figure 8 below shows that by the first week of January 2022, most DNOs have made payments to all of the affected customers in this category.

Figure 8 – Proportion of completed compensation payments for customers with records¹⁶



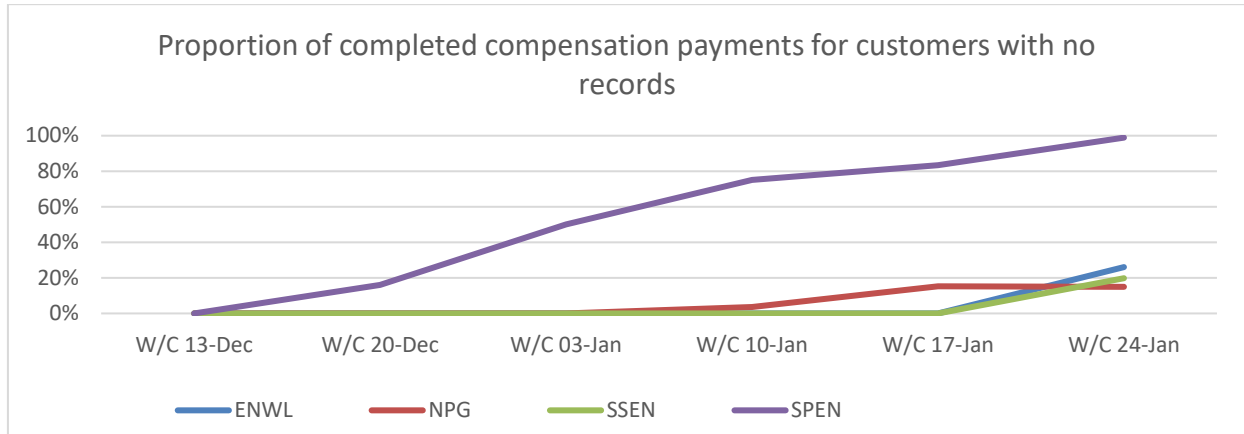
Customers for whom DNOs do not hold records

7.6. Slower progress has been made in identifying customers for whom DNOs do not hold records, and consequently in processing compensation payments for them (as shows in Figure 9 below). SPEN has been the quickest to date in making payments to all of the affected customers under this category.

Figure 9 – Proportion of completed compensation payments for customers with no records¹⁷

¹⁶ The figure shows compensation payments made under ESG 11 standard, which applies to supply restoration during severe weather conditions. All DNOs except UKPN made compensation payments under ESG 11. UKPN used ESG 2, which applies to supply restoration during normal weather conditions. It is reflective of the fact that the UKPN did not experience the same level of impact of Storm Arwen compared to other DNOs.

¹⁷ The figure excludes WPD and UKPN who did not have affected customers in this category.



7.7. DNOs are using a variety of methods to identify customers for whom they did not hold contact details to pay the necessary compensation, including:

- SPEN have sent letters to customers, and they have phone lines and e-mail addresses available for queries. Contact has also been made with Local Authorities to support data sharing where needed.
- ENWL have sent letters and made phone calls where the phone number has been on record, otherwise a member of staff has been sent to the property.
- SSEN have written to all customers with incomplete details, and those customers with a phone number on record have been called. They are also contacting third parties to help get in touch with the remaining customers including housing associations, councils, and other utilities.
- NPG have established a dedicated phone line, email address and online web form for customers to supply details. Customers are also able to claim by post. Stakeholder bulletins have also been issued including to MPs to publicise the compensation process, including face to face workshops led by local MPs.

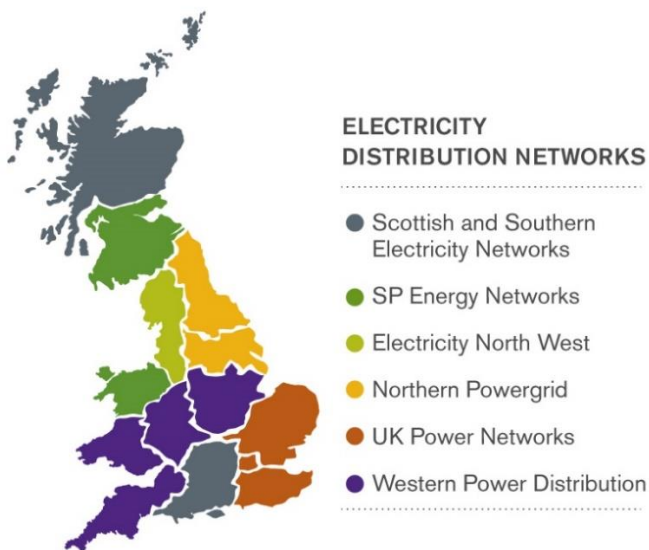
Initial Findings

- Lifting of the compensation payments cap will allow customers to be fully compensated for the outage they have experienced. We will examine the current GSOP compensation payments cap arrangements as part of the review.
- All DNOs appear to have made good progress in December 2021 to make compensation payments to customers for whom they hold records.
- It is taking some DNOs a considerable amount of time to identify customers for whom they do not hold records. We will explore causes of this as part of the review and will recommend any improvements that should be made.

Appendix 1 – Regulatory framework

There are fourteen DNOs operating in Great Britain, managed by six companies. These are shown in Figure 10 below. The impacts of Storm Arwen were felt across the GB electricity system, with 11 of the 14 GB network licence areas being significantly affected, although to differing extents. The only network licence areas not significantly affected were UKPN’s three licence areas in London, the South East and East of England.

Figure 10 – Map of the DNOs’ licence areas



Consumers pay for DNOs to operate and maintain the electricity distribution network through their electricity bills. These charges make up around £112, or 16 per cent, of an average customer’s annual electricity bill¹⁸. The revenue a DNO can recover through these charges is set during the electricity distribution price control (RIIO-ED1), which is the price control that is in place between 2015 – 2023.

Guaranteed Standards of Performance (GSoPs)

The GSoPs¹⁹ specify minimum levels of service expected of DNOs. If a DNO fails to meet these, the affected customer may be entitled to a payment to compensate for the inconvenience caused by loss of supply.

The GSoPs cover a range of activities - including restoring supply during an unplanned interruption and notice periods for planned interruptions. The amounts paid vary depending

¹⁸ Infographic: Bills, prices and profits dated 16 December 2021.

¹⁹ The Electricity (Standards of Performance) Regulations 2015.

on the activity involved. In some cases, DNOs will only be able to make a payment once they are informed by a customer that they have not met the GSoP.

The GSoPs set out our minimum expectations for the levels of service that is expected of DNOs; a DNO may decide to increase the payment levels or make a payment for a supply interruption that does not reach the minimum thresholds.

Customers directly connected to the DNOs’ distribution network and were off supply for longer than 48 hours because of Storm Arwen, are entitled to payments under GSoPs.

Interruptions Incentive Scheme

Network reliability determines whether customers face interruptions in their supply that can be due to a number of factors, including weather events, such as Storm Arwen. Because of the impact that an unreliable network can have on customers, we implemented the Interruptions Incentive scheme (IIS), which encourages DNOs to improve reliability of the network. The IIS sets targets for the number and duration of interruptions and financially rewards or penalises DNOs depending on their performance against targets. The incentive is capped to ensure that DNOs do not make investments to earn greater rewards than customers are willing to pay.

We recognise that some interruptions in supply are outside a DNO's control and can occur despite the DNO having taken appropriate mitigating actions. In these cases, the DNO can apply to us to have its interruptions performance adjusted to reflect the fact that an exceptional event has occurred.

Since the introduction of the IIS in 2002, there has been approximately a 45% reduction in the number of power cuts and a 60% reduction in the duration of power cuts.

Safety and Security of Supplies Enquiry Service

Under their licence conditions (SLC 8), DNOs are required to operate an enquiry service at all times on every day of each year to enable any person to receive reports and offer information, guidance, or advice about any matter or incident affecting or likely to affect the DNO’s distribution system. DNOs are also required to ensure that all reports and enquiries are processed in a prompt and efficient manner. Following the severe storms that

affected the UK in the winter of 2013, the 105 number²⁰ was established in 2016. This provided a single telephone number for customers to get in touch with their local electricity network operator, wherever they are based, and report a power cut or network safety issue.

Priority Service Register

DNOs have a licence condition (SLC 10) to establish and maintain a Priority Services Register (PSR) and set up and maintain practices and procedures to identify Domestic Customers who may be eligible to become PSR customers as a result of its customer interactions and offer to add them to the PSR. This condition sets the minimum standard DNOs are required to deliver and is in place to ensure DNOs provide necessary support to consumers that may be especially vulnerable during supply interruptions.

DNOs are obliged under this condition to ensure that during an unplanned interruption of supply to their premises PSR customers are promptly notified and kept informed of the time at which the supply is likely to be restored, and of any help that may be able to be provided in the meantime.

Ofgem also encourages the delivery of high-quality activities and outcomes beyond a business-as-usual level through the RIIO-ED1 Stakeholder Engagement and Consumer Vulnerability incentive. To be eligible for reward under the consumer vulnerability element of this incentive, companies must demonstrate the delivery of quality outcomes for customers in vulnerable situations, notably in relation to the approach to management and use of the PSR and associated services.

²⁰ The 105 number is a single free telephone number available for people in England, Scotland, and Wales. The number puts customers through to their local network operator where they can report or get information about power cuts in the local area.

Appendix 2- Supporting data

This appendix provides supporting data for the key findings in the main body of this report.

Network resilience funding

Table 8 – Allowance in relation to resilience for RIIO-ED1 (£m, 2020/21 prices)

DNO	2016	2017	2018	2019	2020	2021	2022	2023	ED1
ENWL	10.15	8.75	8.87	8.63	8.23	8.90	8.52	8.35	70.40
NPG	23.76	22.38	19.85	18.54	15.98	15.75	15.05	15.17	146.49
SPEN	42.52	44.30	43.15	41.05	41.10	40.91	31.90	31.13	316.07
SSEN	36.37	34.49	32.77	30.92	29.13	28.67	28.29	27.86	248.51
WPD	60.47	60.60	59.75	51.76	51.20	51.05	44.04	43.49	422.35
UKPN	42.50	43.39	42.53	42.41	41.31	39.57	38.38	37.12	327.21
Total	215.78	213.91	206.94	193.32	186.94	184.86	166.18	163.11	1531.04

Table 9 – Actual Spend in relation to resilience for RIIO-ED1 (£m, 2020/21 prices)

DNO	2016	2017	2018	2019	2020	2021	2022	2023	ED1
ENWL	18.30	14.92	15.65	20.32	16.86	9.96	-	-	96.00
NPG	26.90	25.81	24.77	25.51	27.49	21.37	-	-	151.84
SPEN	35.63	39.85	34.24	39.40	52.90	60.68	-	-	262.70
SSEN	52.95	56.97	41.43	38.37	49.41	41.61	-	-	280.74
WPD	106.47	102.18	89.59	67.30	65.86	63.40	-	-	494.81
UKPN	32.12	31.30	36.96	45.71	49.80	37.34	-	-	233.23
Total	272.37	271.03	242.63	236.61	262.31	234.35	-	-	1519.32

Pole replacement volumes

Since the start of RIIO-ED1 until now, there has been a decrease in volume of LV and HV Poles by 52,168 (3.1% of total population) and 7,735 (0.4%) respectively. This includes a reduction in LV and HV Poles categorised as either HI 4 or HI 5 by 12,731 (7.9% of total population of HI 4 and HI 5 assets) and 3,975 (3%).

Table 10 - LV Poles Asset Replacement Volumes

	LV Poles - Total			LV Poles - HI 4 & HI 5		
	Start of ED1	End of 2021	Change	Start of ED1	End of 2021	Change
ENWL	57,935	53,623	- 4,312	5,132	10,551	5,419
NPG	141,822	116,290	-25,532	16,153	31,068	14,915
WPD	561,761	545,361	-16,400	49,959	45,525	- 4,434
UKPN	367,858	367,090	- 768	14,813	20,058	5,245
SPEN	187,990	185,143	- 2,847	37,312	25,016	-12,296
SSEN	352,545	350,236	- 2,309	36,965	15,385	-21,580
Total	1,669,911	1,617,743	-52,168	160,334	147,603	-12,731

Table 11 - HV Poles Asset Replacement Volumes

	6.6/11kV Poles - Total			6.6/11kV Poles - HI 4 & HI 5		
	Start of ED1	End of 2021	Change	Start of ED1	End of 2021	Change
ENWL	98,472	95,602	-2,870	4,731	4,686	-45
NPG	177,018	177,089	71	16,336	36,395	20,059
WPD	721,382	719,930	-1,452	47,899	41,368	-6,531
UKPN	280,827	277,850	-2,977	8,584	18,538	9,954
SPEN	353,737	353,857	120	89,413	72,497	-16,916
SSEN	470,471	469,844	-627	37,568	24,982	-12,586
Total	2,101,907	2,094,172	-7,735	204,531	198,466	-6,065

	20kV Poles - Total			20kV Poles - HI 4 & HI 5		
	Start of ED1	End of 2021	Change	Start of ED1	End of 2021	Change
NPG ²¹	63,200	62,927	-273	5,721	13,490	7,769
Total	63,200	62,927	-273	5,721	13,490	7,769

²¹ NPG is the only DNO that utilises 20kV overhead poles across its network for historic purposes. These were used to provide power to coal mining operations in the area.