ESB NETWORKS

Storm Éowyn Review

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Contents

Executive Summary

On January 24th, 2025, following a nationwide Red Warning alert, Storm Éowyn caused unprecedented damage to Ireland's electricity network. With record-breaking gusts of 184 km/h the storm triggered over 10,000 faults and impacted 768,000 customers at the peak. This was more than double the impact of Storms Darwin (2014) or Ophelia (2017), and an almost 93% increase in customer impact when compared to the most recent storm that ESB Networks experienced, Storm Darragh (December 2024).

Unprecedented Impact to Communities and Businesses

ESB Networks would like to acknowledge the unprecedented impact that Storm Éowyn had on our customers. The extensive power outages caused by the storm brought significant disruption and hardship to communities, businesses, homeowners, farmers, schools, emergency services, and community support organisations.

ESB Networks also acknowledges that electricity has become an integral part of everyday life and is a service that many other core services depend on. The power outages due to Storm Éowyn meant that customers experienced a lack of running water, broadband, sewage disposal, and food storage issues. The disruption to daily life by customers is personified through the real conversations which took place between our Customers and our Customer Contact Centre staff during and in the aftermath of Storm Éowyn. We also acknowledge the extreme difficulty experienced due to the protracted period of impact and in particular, wish to highlight situations such as vulnerable customers with in-home medical equipment running out of battery power, customers caring for those with special needs, elderly and otherwise infirm, those living on their own and who were dependent on broadband and media for connection to the outside world, customers who were unable to travel beyond their homes due to fallen or low hanging power lines and trees, farmers with trying to manage livestock, businesses that had to temporarily close, workers who were unable to work from home, and children who were unable to attend school.

Mobilisation of Restoration Works to Reconnect Power

Restoring power to all customers required significant, exceptional and unprecedented effort, with help coming from across Europe. Following the activation of ESB Networks' storm restoration plans, preparation to mobilise all required resources began as the initial weather alerts were received.

Well in excess of 4,000 people made up of staff, contractors and donated crews from many European utilities were involved in the power restoration efforts, both in the field and across critical enabling and support functions around the country. The effort to assess the damage and restore customers was supported by over 50 forest harvesters and track machines, along with 6 helicopters. In the ESB Networks' expanded National Customer Contact Centre, staff and volunteers worked around the clock, supporting customers through inbound and outbound calling. Cargo planes were used to rapidly deliver additional materials, and extensive logistics (including 1,170 up to hotel bookings each night) enabled rapid deployment and resource mobilisation in the areas affected. ESB Networks' material supply chain proved to be resilient during Storm Éowyn, supporting restoration efforts effectively, with the exceptional stock of storm materials, reserved since Storm Darwin, deployed for only the third time. Despite record material usage in a short period of time, no significant shortages occurred that affected the restoration effort, and plans are now in place to further increase storm-specific stock levels to enhance future preparedness.

Owing to huge efforts from everyone involved, almost 70% of the customers had their power restored 72 hours after the storm crossed the country. After 7 days, 90% of customers were reconnected. All remaining customers had power restored on February 11th, 18 days after the storm hit Ireland.

Communications with Customers and Stakeholders

Throughout the entire restoration period, communication with customers was vital. Almost 400 staff and volunteers worked across the main and backup Customer Contact Centres, handling over 250,000 inbound calls, making over 55,000 outbound calls/texts, and supporting ESB Networks' Powercheck application, which had 11.7 million views. Radio, TV, and social media were critical in keeping communities informed throughout the entire duration of the storm restoration period. However, a large frustration among electricity customers impacted by Storm Éowyn was in relation to the receipt of Estimated Restoration Times (ERTs) from ESB Networks. In a number of cases, customers received multiple ERTs, which added to the immense challenges experienced by the customers from loss of power supply.

An extremely important group of customers are registered Vulnerable Customers who are dependent on electricity for medical and other needs. Every effort was made by ESB Networks to keep these customers informed, both before and after the storm landed. As the scale of the impact to the network became evident, additional measures were taken to further support these customers. A dedicated team of volunteers was established, making 17,000 outbound calls to Vulnerable Customers to let them know when their supply would be restored and to advise them of local supports that were available through the humanitarian aids provided by the Government's National Emergency Coordination Group (NECG). Where contact could not be made, ESB Networks made the decision to escalate specific cases to the authorised channels, including the HSE, An Garda Siochana, and emergency services. Additionally, through interfaces established by the NECG, ESB Networks' dedicated Coordination Team for Critical Infrastructure owners managed the escalation of over 1,800 critical infrastructure sites for reconnection, including hospitals, water and wastewater facilities, telecoms, air navigation sites, coastguard stations, and schools. The NECG's Critical Infrastructure subgroup played a vital role in supporting emergency power restoration. Their multi-agency approach enabled the rapid deployment of generators to geographically dispersed sites, first by infrastructure owners, then by NECG.

Damage to the Electrical Network

The winds that crossed the country on January 24th caused damage to the electrical network on a scale not seen before. On the ground over 12,500 assessments of damage were completed, identifying enormous levels of repair work. Most of the damage was caused to the medium and low voltage network, but the higher voltage infrastructure did experience more damage during Storm Éowyn than during previous storms. Analysis of the damage assessments has shown that hedgerow timber and forestry were the primary drivers in a large portion of the damage caused with the high winds causing trees particularly and some branches to come into contact with adjacent overhead power lines in 59% of the damage assessments completed. A statistical analysis of hedgerow timber fault assessments found that approximately 70% involved trees falling on the network, with results accurate to a 95% confidence level and ±5% margin of error. Overall, approx. 4,500 poles, or ~0.2% of ESB Networks' 2.4 million poles, required replacement. Due to the extensive volume of medium and low voltage network faults, in many cases, difficult terrain presented significant access challenges for repair crews, which in turn prolonged the supply restoration times for customers in these locations.

Safety

Throughout the entire period of restoration, safety was paramount for ESB Networks, for the public and the repair crews. Early restoration efforts focused on public safety, with advance crews attending to emergency situations reported by customers (such as lines on the ground or broken poles) and being deployed rapidly to make the situation safe, prior to repairs taking place over subsequent days. Over 4,900 calls reporting potentially dangerous electrical situations were logged to the Customer Contact Centre. Notably and thankfully, no serious electrical safety incidents occurred.

Summary

Recognising that the unprecedented nature of Storm Éowyn required enormous effort from a wide range of people, ESB Networks wishes to express its sincere appreciation to everyone who supported the restoration efforts, including the dedicated staff, contractors, visiting utility crews, and partner organisations, whose tireless work and collaboration were instrumental in restoring power safely to all affected customers.

As with all major weather events, there are key learnings from Storm Éowyn and ESB Networks remains firmly committed to learning from this event. The implementation of the recommendations that have been identified throughout this report will continue to seek to improve the resilience of ESB Networks' electrical network and enhance the emergency response capabilities to continue to support customers in future severe weather events. The following recommendations have been assigned owners within ESB Networks for implementation.

Summary of Key Recommendations

- **Storm Preparedness #1**: ESB Networks should continue refining storm-related procedures based on learnings from Storm Éowyn, as it has after previous events, by confirming the availability of nominated role holders and the extensive volunteer resource pool ahead of storm season.
- **Storm Preparedness #2**: ESB Networks to further leverage its digital and data capabilities to enhance future storm preparedness and restoration efforts, through the planned development of a Storm Response Toolkit.
- **Asset Performance #1**: ESB Networks to continue engagement with stakeholders on legislation for hedgerow timber management and forestry corridors where electrical network passes through. ESB Networks will continue to progress the plans to grow the timber cutting contractor capacity and will continue to engage with customers to support ESB Networks programmes to address hedgerow timber and forestry issues that present risk to the electrical network.
- **Asset Performance #2**: ESB Networks to complete a review of design standards for the distribution network, and to continue engagement with the Transmission System Operator, EirGrid, on the proactive design, development, and maintenance of the transmission network. Asset replacement programmes based on cyclic condition assessments for poles and conductors should continue into PR6 and beyond, whilst the introduction of new technologies and materials to further enhance grid resilience is examined and progressed.

- **Asset Performance #3**: Based on reviews of previous weather events, interactions with international utilities and discussions with the visiting crews during Storm Éowyn, ESB Networks believes that while the impact of severe weather events can be mitigated, given the extent and nature of our network the full impact of a major storm event cannot be entirely eliminated. In addition, though like-for-like comparisons are difficult given the variation in windspeeds and affected geographies, and differences in the extent and nature of the networks, it appears that ESB Networks' restoration performance has historically compared well with other countries. However, there is always scope for learning and improvement. ESB Networks will therefore continue to review how international utilities have responded to severe and impacting weather events to reduce the residual risk. Specifically, the company will complete an international review of utilities and the decisions made by these utilities in the aftermath of large weather events.
- **Asset Performance #4**: ESB Networks should carry out a review of data capture for faults in the Network Management System to assist with the ongoing improvement of network resilience planning, and wider storm related benefits.
- **Resource Mobilisation #1**: Further strengthen relationships with international utilities, both through the review of existing structures in place with North, East, West, South Area Consortium (NEWSAC, a forum promising mutual aid in emergency situations among member electricity utilities in Ireland and the UK), and establishment of new agreements with the wider European utilities through engagement via E.DSO (European Distribution System Operator - the membership organisation for Distribution System Operators in Europe). Enhance storm readiness by increasing storm-specific material stock levels beyond pre-Storm Éowyn baselines and exploring harmonisation of materials with wider European utilities.
- **Resource Mobilisation #2**: Review and update the Regional & Local Storm Plans / Documents to ensure learnings are incorporated into future versions, with a focus on:
  - Reviewing the composition of crews during storm restoration to determine, and document, the best structure for optimum effectiveness for future storms
  - Defining the steps for the demobilisation of crews, including the transition to post-storm network repair and safety patrolling
  - The data capture process during both the damage assessment stage (foot patrol, heli patrols, drones etc) and network repair stage to maximise value of data during and after storm
- **Resource Mobilisation #3**: Enhance ESB Networks' capability to use Smart Meter data in fault scenarios, both non-storm and storm, to maximise the use of available data for customer outage management, including any relevant changes to the data access code.
- **Customer and Comms #1**:
  ESB Networks to further enhance support for Vulnerable Customers by progressing the planned measures set out in our PR6 submission, and to make a recommendation that the NECG explore how information on Vulnerable Customers can be consistently managed across all utilities and services, acknowledging the existing data-sharing requirements between suppliers and ESB Networks.

- **Customer and Comms #2**:
  Explore how improvements can be made to outage communication during storm events by enhancing the use of available data for the calculation, management, and transparency of Estimated Restoration Times (ERT). This should be supported by the development of a pre-winter Communications Plan to provide information to customers on ESB Networks' Estimated Restoration Times process during storms. Continue to enhance the functionality of ESB Networks' Power Check application to further improve the communication to customers during storms.
- **Customer and Comms #3**:
  Recommend that the NECG consider formalising coordination structures by building on the Humanitarian and Critical Infrastructure Subgroups established during Storm Éowyn, including an assessment of the interdependencies of the critical infrastructures.
- **Customer and Comms #4**:
  Working with Critical Infrastructure owners, ESB Networks should continue the installation of Smart Meters in all Critical National Infrastructure sites to further enable the assessment of power supply during storm situations. ESB Networks should support the Critical Infrastructure owners with risk assessing their back-up generation requirements at key sites.
- **Customer and Comms #5**:
  ESB Networks should regularly review and update its newly extended volunteer list of staff for roles within the Customer Contact Centre during storms, with the regular refresher training to be provided.
- **Customer and Comms #6**:
  ESB Networks should review the coordination and availability of media updates during periods of storm restoration, and ensure adequate resources are available in the Press Office for protracted weather events. ESB Networks should explore how to improve visualisation of data for external communications during storm events.
- **Safety Issues #1**:
  Formalise Safety Assurance roles within emergency storm plans to include dedicated auditors for real-time observation and post-storm safety auditing, aligned with day-to-day safety practices. Standardise safety protocols for visiting utilities through NEWSAC and E.DSO collaboration, including the development of Storm Safety Toolboxes to support consistent safety practices. Ensure employee wellbeing by applying oversight to the scheduling rest days during and after storm events, to safeguard recovery and performance.

Introduction

ESB Networks recognises the profound impact that Storm Éowyn had on communities across Ireland during January and early February 2025. The extensive power outages caused by the storm brought significant disruption and hardship to thousands of homes and businesses, particularly in the most severely affected regions. ESB Networks extends sincere appreciation for the patience of all customers during this challenging time.

ESB Networks also wishes to express sincere thanks and appreciation to all those who supported the restoration efforts, including the dedicated staff, contractors, crews from international utilities, and partner organisations, whose tireless work and collaboration were instrumental in restoring power safely and as quickly as possible. ESB Networks would also like to thank the various organisations and people across the country, including the hospitality sector and local businesses, who supported the crews and staff during the restoration efforts.

ESB Networks remains firmly committed to learning from this event, while continuing to develop the electrical infrastructure and enhancing the emergency response capabilities to seek to accelerate restoration and support customers in future severe weather events.

The following review has been completed, covering the five main areas, as set out in the Terms of Reference, including an additional section to provide an overview of the restoration process. The report captures key findings and highlights the main recommendations for ESB Networks to implement across the five areas of:

- **Storm Preparedness**
- **Asset Performance**
- **Resource Mobilisation**
- **Customer and Communication**
- **Safety Issues**

This review is one of three pieces of work being undertaken by ESB Networks in the aftermath of Storm Éowyn.

In parallel with this review, ESB Networks is carrying out a formal International Review of Utilities and the decisions made by these utilities in the aftermath of large weather events. ESB Networks is also carrying out a review of the design standards of the distribution network.

The output of all three reviews will inform future standards for the development of the distribution network, focusing on the ability to withstand significant weather events into the future.

Background Information

The electricity system comprises transmission (typically voltages of 110kV and above) and distribution (voltages under 110kV) networks, and includes all substations, overhead lines, and underground cables that are used to bring electricity to Ireland's 2.4 million domestic, commercial, and industrial customers. It includes approximately 160,000km of overhead network, 28,000km of underground cables, and almost 800 High Voltage substations (primarily ESB Networks-owned substations, with a smaller number of customer-owned substations).

ESB is the licensed Transmission Asset Owner (TAO) and Distribution Asset Owner (DAO) for Ireland. ESB Networks DAC, a wholly owned ringfenced subsidiary within the ESB Group is the electricity Distribution System Operator (DSO) for Ireland. In accordance with arrangements approved by the Commission for Regulation of Utilities, staff in the ESB Networks business unit carry out ESB Networks DAC's functions as DSO, in addition to the functions of ESB as the licensed TAO and DAO, under the management of ESB Networks DAC. In carrying out ESB's functions as TAO and DAO, ESB Networks staff are responsible for (a) building and maintaining the high voltage transmission system in line with requirements set out by EirGrid, the transmission system operator (TSO) and (b) carrying out all functions relating to the electricity distribution system, including asset management, planning, construction, maintenance, and operation of the high, medium, and low voltage distribution network.

ESB Networks Planner Groups

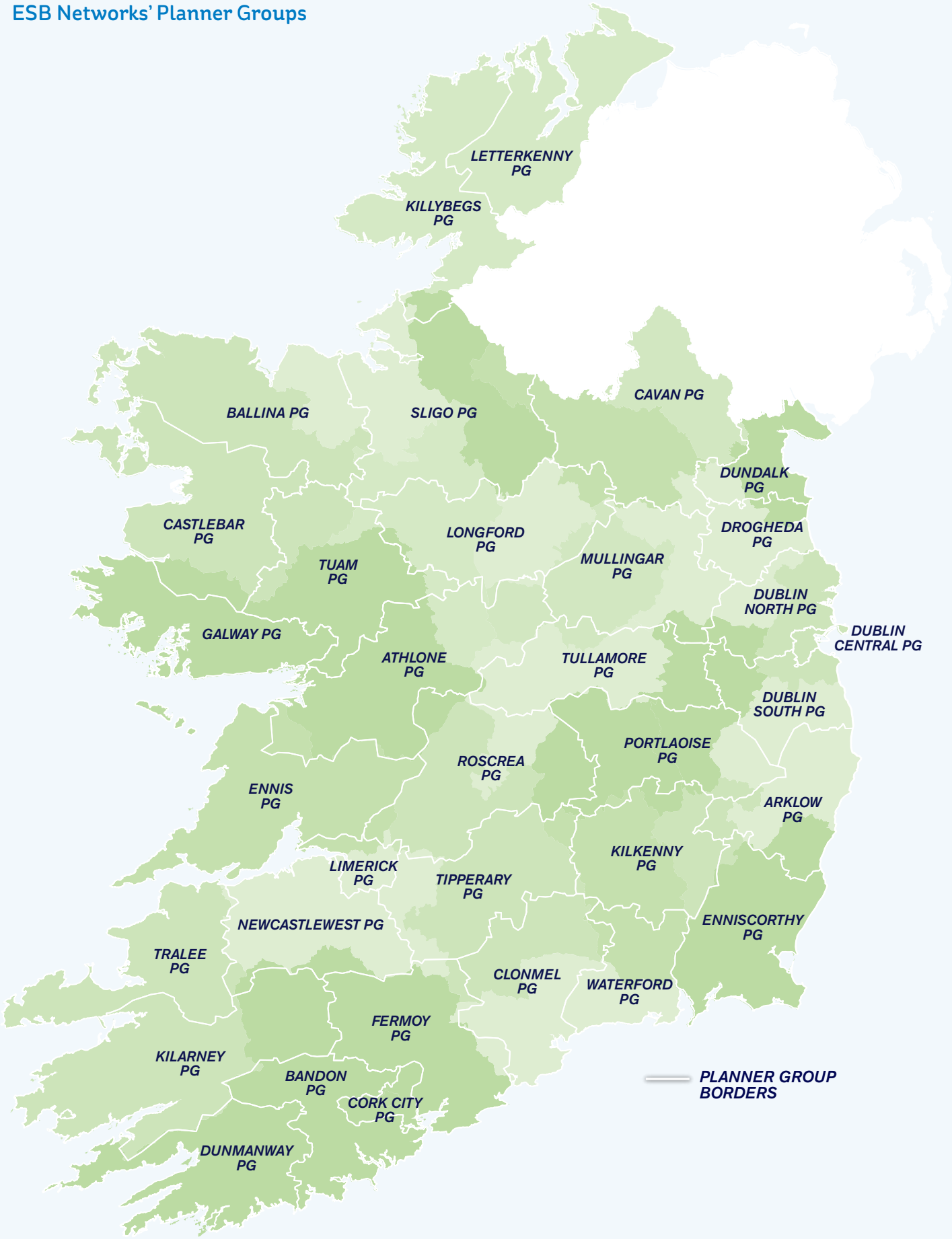
There are references throughout the document to ESB Networks' Planner Groups. ESB Networks manages its operations nationally across 34 areas, called Planner Groups. While a planner group may have the same name as a town, it may have wider reach than the named town itself. The geographical area covered by each planner group is outlined in the map below.

Hedgerow Timber and Forestry

ESB Networks' electrical network crosses the countryside and doesn't follow the road network. Trees and other related vegetation that are adjacent to the network have the potential to interfere with the network. The following two terms are used within this report, and are defined as follows:

- **Definition of Forestry**
  - Trees that are part of managed forests or woodlands.
- **Definition of Hedgerow Timber**
  - Any individual trees and hedgerows in urban or rural areas adjacent to the network that have the potential to interfere with the network. This includes trees adjacent to the network that are not part of Forestry described above, such as roadside trees, countryside hedges, garden trees.

ESB Networks' Planner Groups



Governance

This report forms part of ESB Networks' broader governance framework for crisis management and operational resilience. Throughout Storm Éowyn, the Board of ESB Networks DAC maintained oversight of the company's crisis response and was kept informed of developments, restoration progress, and customer impact. The Board's engagement ensured that strategic decisions were aligned with ESB Networks' commitment to public safety, service continuity, and stakeholder coordination.

Feedback

With the completion of this review, ESB Networks will seek feedback from stakeholders including the critical infrastructure owners, the utilities who supported ESB Networks' restoration efforts, and ESB groups from outside ESB Networks. Feedback will be sought on the on the findings and recommendations contained within this report.

1

Storm Description and Preparedness

1 Storm Description and Preparedness

1.1 Overview of Storm Éowyn and Impact to the Electricity Network

1.1.1 Meteorological Overview of Storm Éowyn

According to Met Eireann's Climate Statement[1] for January 2025, Storm Éowyn developed over the North Atlantic and went through explosive cyclogenesis as it approached Ireland from the southwest. The storm reached peak intensity as it brushed past the northwest coast of Ireland in the early hours of January 24th, with a sting jet forming on its southern side. In advance of Storm Éowyn, a nationwide red wind warning was issued by Met Eireann. Ireland's National Emergency Coordination Group (NECG) issued warnings before the storm arrived, with the Chair of the NECG stating "Storm Éowyn is set to be one of the most severe storms Ireland has seen. It is going to be a damaging, dangerous and destructive weather event. The forecasted winds will bring severe conditions which will constitute a risk to life and property." After the storm, Met Eireann's Climate Statement for January also contained the following facts regarding the storm:

- **Record-Breaking Wind Speeds:** During Storm Éowyn on 24 January 2025, Mace Head, County Galway recorded the highest gust at 99.5 knots (184 km/h*) and the highest 10-minute mean wind speed at 76.5 knots (142 km/h) - the highest in Ireland's digital climate record.
- **Multiple Stations Set New Wind Records:** Four stations broke their highest gust records (up to 150 km/h), and four broke their 10-minute mean wind speed records (up to 115 km/h), with record lengths ranging from 13 to 21 years.
- **Severe Storm Force Levels Reached:** Two stations reached hurricane force 12, four reached violent storm force 11, and eight reached storm force 10 on the Beaufort scale.

It should be highlighted that Storm Éowyn crossed the country only seven weeks after the historically next most significant storm, Storm Darragh, which hit Ireland on December 5th, 2024. Storm Darragh affected 398k customers, and ESB Networks activated its storm response plans and deployed large volumes of resources to restore power to affected customers.

A notable difference when comparing the characteristics of Storm Éowyn to the two previous largest storms experienced by Ireland is the area of the country that was covered by the red alert. During Storm Éowyn, the red alert covered the entire country, whereas Storm Ophelia and Storm Darwin were more localised, with red weather alerts for specific parts of the country.

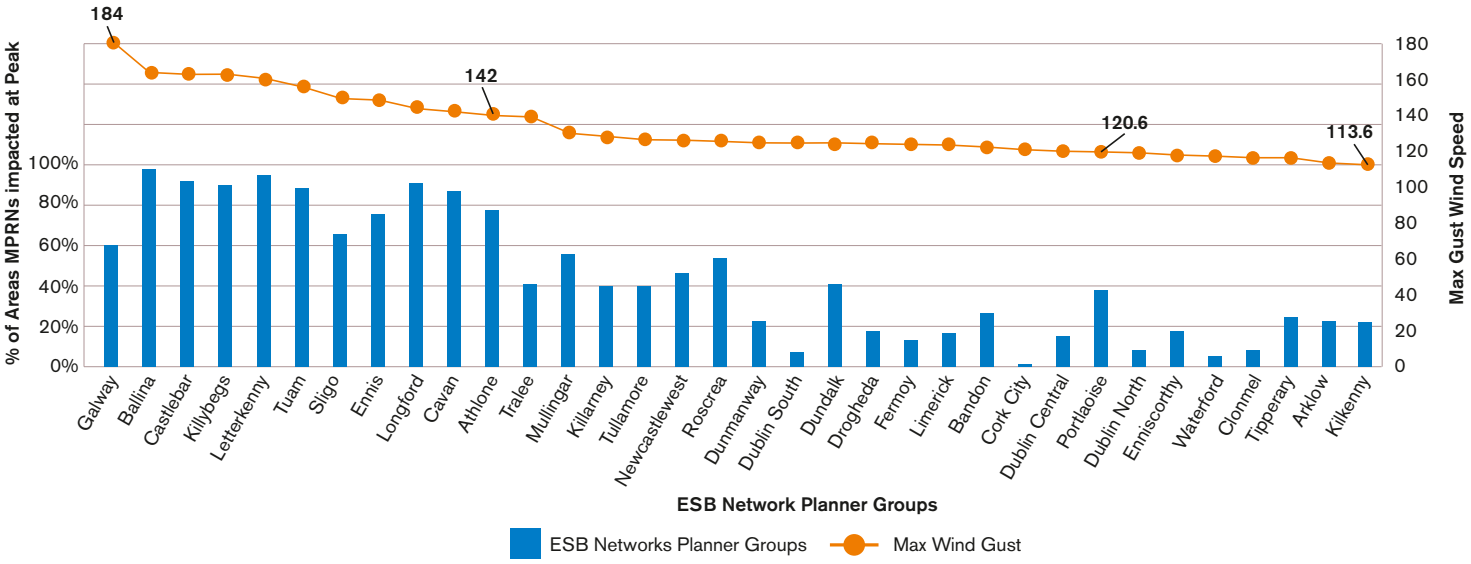
Figure 2: Comparison of Storm Éowyn, Storm Ophelia and Storm Darwin

Storm	Red Alert Coverage	Max Gust (km/h)	Mean Wind Speed (km/h)
Éowyn (2025)	Entire country	184	142 (Mace Head, Galway)
Ophelia (2017)	South & West counties	156[2]	~115 (Roches Point, Cork)
Darwin (2014)	Cork, Kerry, West regions	159	117 (Mace Head, Galway)

1 *Climate Statement for January 2025 - Met Éireann - The Irish Meteorological Service*
2 *Met Eireann report captures a wind gust of 191km/h off the coast of Ireland at Fastnet rock, with 156km/h recorded as the highest wind gust when Storm Ophelia made landfall. met.ie/cms/assets/uploads/2023/08/OpheliaReport_v1.pdf*

Figure 3 shows the maximum wind gust speed (km/h), along with the percentage of customers / MPRNs impacted at the peak in each of ESB Networks managed areas (planner groups). From the graph it can be seen that a number of planner groups, including Castlebar, Longford, and Ballina, had over 80% of the customers without electricity.

Figure 3: % of Customers / MPRNs impacted at Peak & Maximum Gust Wind km/h in each ESB Networks Planner Groups on January 24th



1.1.2 Timeline of events leading up to Storm Éowyn

Table 1: Timeline of Events leading up to Storm Éowyn

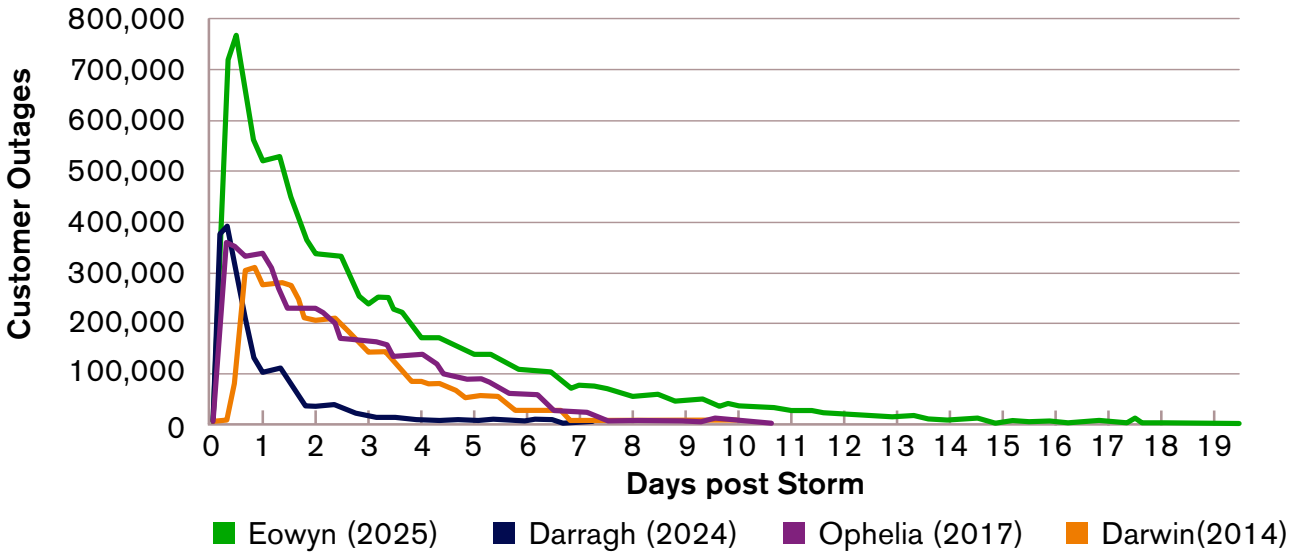
Date	Weather Forecast Received	Key Actions Taken by ESB Networks
Monday Jan 20th	Weather advisory received indicating the potential for high winds at the end of the week.	ESB networks carry out normal monitoring of advisories received.
Tuesday Jan 21st	Met Eireann issued weather advisory projecting the arrival of Storm Éowyn. Met Office UK declared Storm Éowyn.	Internal update issued from ESB Networks' Operations Team within ESB Networks outlining the decision to activate ESB Networks' National Emergency Response Group (NERG) from Wednesday and an instruction to begin preparation of the Regional and Area Storm Response Plans for implementation.
Wednesday Jan 22nd	Met Eireann provided information on the expected storm indicating Storm Éowyn would be destructive, and mainly a wind event. Further details received on projected timeline of arrival and duration of red weather across the country.	National Emergency Coordination Group (NECG) and subgroups meet to monitor forecasts and decide on the necessary escalation. Activation of ESB Networks National Emergency Response Group (NERG) and the National Customer Contact Centre (NCCC) storm response procedure activated. All network related planned work for Friday cancelled. ESB Networks Contractor Partners informed and engaged for preparation for deployment to Storm Restoration. Regional Managers appointed Storm Managers to cover 34 planner groups nationally, who in turn engaged local staff to ensure all local storm roles were filled in anticipation of the storm. North East West South Area Consortium* (NEWSAC) engaged to request additional support. **NEWSAC is a mutual aid agreement among electricity network operators across the UK, Ireland, Jersey, and the Isle of Man. When a major event like a storm causes widespread power outages, NEWSAC enables utilities to share resources, such as repair crews and equipment, across regions*
Thursday Jan 23rd	Further details received on projected timeline indicating that between 6am and 10am, all parts of the country were expected to be in a red weather alert on Friday 24th. Forecasts for subsequent yellow wind warning in parts of the country with strong, gusty winds in South East.	Arrangements made for extra materials to be flown in from Poland and Brazil to supplement storm rations. National refresher training held on managing faults in ESB Networks Network Management System (NMS). Additional staff, with previous network experience and competence, identified, trained and approved to physically make network safe. People who had to travel, did so, to be in position before the storm struck. Abnormally sectionalised network returned to normal operation to increase resilience, and all further planned work was cancelled. ESBN on full storm alert.

1.1.3 Impact to the Electricity Network

Storm Éowyn was the largest storm ever experienced by Ireland, and it followed less than two months after the previous largest storm in terms of impact on electricity customers - Storm Darragh - in December 2024. At the peak, approximately 768,000 customers (approximately one third of all properties) lost electricity supply during Storm Éowyn. The scale of damage to the network was unprecedented and required extensive restoration efforts.

Almost 70% of affected customers had their power restored within the first 72 hours, with almost 90% of customers regaining supply within one week after the storm crossed the country. Figure 4 shows the comparison of Storm Éowyn, with previous significant storms; Darragh, Ophelia and Darwin. During Storm Darragh, 398,000 customers lost power at the peak, and restoration efforts took 7 days. Storm Éowyn exhibited higher peak wind speeds and a more intense sting jet, leading to greater power outages and coastal flooding risks. Storm Darragh, while slightly weaker, had unusual north-westerly winds, making it particularly damaging for areas typically sheltered from storms.

Figure 4: Comparison of Customer Outages for Storm Éowyn, Darragh, Ophelia and Darwin



Storm	Wind Speeds (in a gust)	Sustained Wind (10min mean)	Customer Outages
Éowyn (Jan '25)	~184km/h	~142km/h	768k
Darragh (Dec '24)	~141km/h	~111km/h	398k
Ophelia (2017)	~156km/h	~115km/h	396k
Darwin (2014)	~159km/h	~120km/h	342k

The high wind speeds experienced during Storm Éowyn caused damage to the electrical network across the country. Further information on network damage is provided in Section 3. The photos overleaf show some of the damage caused to the network as Storm Éowyn passed through the country.

Figure 5: Ardnaree – Rahans 38kV network Co, Mayo

Figure 6: Arva - Carrick On Shannon 110kV network, Co. Leitrim

Figure 7: Dalton – Tuam 38kV network, Galway

Figure 8: Cong – Headford 38kV network, Mayo

1.1.4 Overview of damage caused across the country

Storm Éowyn caused significant damage to the Irish forestry industry destroying thousands of trees across Ireland. Following an initial satellite assessment of the damage to Irish forests completed by the Department of Agriculture, Food and the Marine and Coillte, it is estimated that almost 24,000 hectares of both Coillte and privately managed forests suffered wind damage as a result of Storm Darragh and Storm Éowyn*. In comparison to previous storms, the level of damage to forestry during Storm Éowyn was the highest ever experienced. Table 2 provides a comparison of forestry damage from recent significant storm events, and Storm Darwin in 2014. It has been reported that the recent storm events have resulted in the windthrow of 2.3 times the volume of timber that is normally harvested annually.

Table 2: Comparison of Max Gust Wind Speed (km/h), Customer Impact & Forestry Damage for 3 Largest Irish Storms

Storm	Max Gust Wind Speed	Power Outages	Estimated Forestry Damage
Éowyn (2025)	**184 km/h (Mace Head)**	**768,000 customers**	**24,000 hectares**[1]
Darragh (2024)	150 km/h	395,000 customers	
Darwin (2014)	159 km/h	215,000 customers	8,000 hectares [2]

The most heavily damaged parts of the electricity network during Storm Éowyn were in areas of significant afforestation, which required significant effort to repair affected network deeply embedded in the forested area. Before ESB Networks' crews could access the damaged network to be repaired, forestry machinery was required to cut back the fallen trees and provide a clear access path to the location of the damaged network. At its peak, ESB Networks had over 50 industrial-scale forest harvesters and track machines engaged in the post-storm restoration efforts.

Table 3 outlines the length of the electrical network that runs through forestry corridors at each voltage level in Ireland. 3,112 kilometres of the Medium Voltage (10kV and 20kV) overhead network runs through forestry, and although this is a very small proportion of ESB Networks' overall network length, it was disproportionately impacted by storm damage.

Table 3: Total km of ESB Networks' electrical network that runs through forestry

Voltage	Networks km's	Total Forest	% Network in Forest
10 & 20kV (MV)	85,006	3,112	3.7%
38kV	5,623	263	4.7%
110kV	4,750	298	6.3%
220kV	1,820	72	4.0%
400kV	435	38	8.7%
Total	**97,634**	**3,782**	**3.9%**

1 *Minister Healy-Rae confirms initial satellite assessment puts area of storm-damaged forests at nearly 24,000 hectares*

2 *Estimating-the-extent-of-damage-to-forests-following-storms-darragh-and-eowyn-using-th.pdf*

Forest windblow is the uprooting or felling of trees by wind. It affects the storm restoration effort in two main ways as illustrated in Figure 9. Firstly, access routes through the forest to reach the affected network can be blocked due to fallen trees, and secondly in advance of repairing the network, there can be significant cutting and clearing of the corridor required, which extends the time it takes to restore power to customers in the affected areas. In many such circumstances, particularly, there have only been small pockets of customers at the end of these circuits, meaning many hours of timber-cutting repair work required for a small decrease in the national number of customers without supply.

Figure 9: Impact of Forest Windblow to Storm Restoration Efforts

1.2 ESB Networks Emergency Planning for Storms

ESB Networks has three main documented plans that cover business continuity and associated delivery plans for application during storms. These are effectively ESB Networks' guidelines on how the organisation should manage all aspects of storm restoration, and are namely:

- Business Continuity Plan – Storm Recovery
- Region And Area Storm Recovery Emergency Plan
- National Customer Contact Centre Response Plan for Storm Events

These plans have been updated and refined over the years to reflect learnings from past storms. The Business Continuity Plan (Storm Recovery), and the Region and Area Storm Recovery Emergency Plan, together describe how ESB Networks organises itself to implement the restoration plans at national, regional and local levels. The organisational structure comprises of three main resource groups:

- National Emergency Response Group (NERG)
- Regional Storm Response Organisation
- Local Area Storm Response Organisation

Further information on the National Customer Contact Centre (NCCC) Response Plan is provided in Section 5.

The storm plans are reviewed on a regular basis to ensure that all roles have designated role holder names and contact details and that roles are up to date and clearly understood. The level of resources that are allocated during a storm is decided in conjunction with the information being received from Met Eireann and the commercially sourced weather update company, Meteomatics[1] and DTN[2], along with engagement with stakeholders including Ireland's National Emergency Coordination Group (NECG).

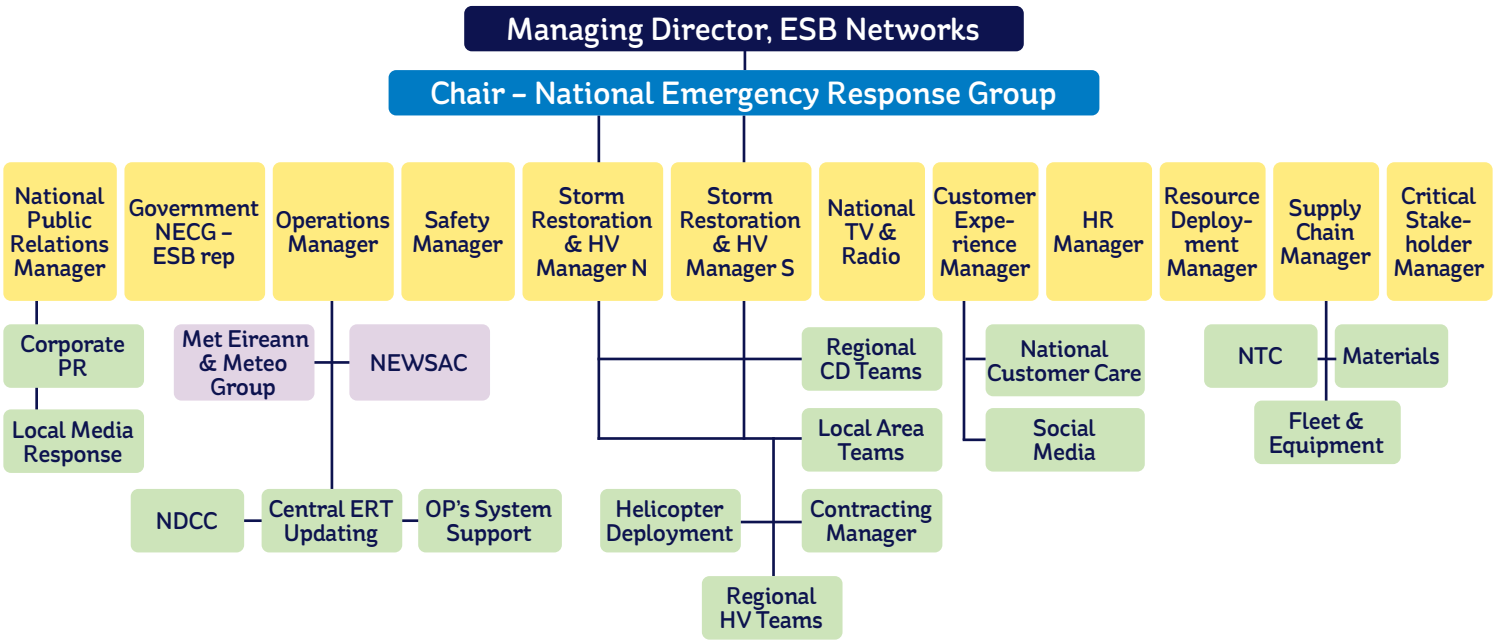
The projected magnitude of Storm Éowyn required activating these groups and putting preparations in motion in the days leading up to the storm, designating all available resources to support the restoration.

1 *Meteomatics is a company that specialises in high-resolution commercial weather forecasting from data gathered using advance weather drones.*
2 *The DTN Weather Hub delivers dynamic, sector-specific risk intelligence, by combining real-time forecasts, customer context, and operational AI.*

1.2.1 ESB Networks' National Emergency Response Group

The National Emergency Response Group (NERG) is ESB Networks' central co-ordination group which oversees all aspects of the storm response. The structure of this group is represented in Figure 10. Senior members of the ESB Networks' team are assigned to each of the listed roles, and the group meets regularly, often multiple times during each day of a storm and subsequent recovery period.

Figure 10: Organisational Structure for ESB Networks National Emergency Coordination Group (NERG)



The NERG was activated on Wednesday 22nd January and named individuals were assigned to each of the roles set out in the NERG plan. Each role holder then mobilised their teams in preparation for the storm, familiarising themselves with the likely impact of Storm Éowyn.

Between January 22nd and February 11th, the NERG met 27 times. The meetings were managed through a structured agenda, including safety performance, customer outages status, restoration updates, customer and communications, materials and logistics, and external stakeholder engagement. The group was stood down on February 11th.

1.2.2 Regional Storm Response Organisation

The standard regional organisational structure for storm restoration is shown in Figure 11. All roles are allocated to specific individuals, who meet regularly and are in constant discussion following a major storm event until all customers are reconnected.

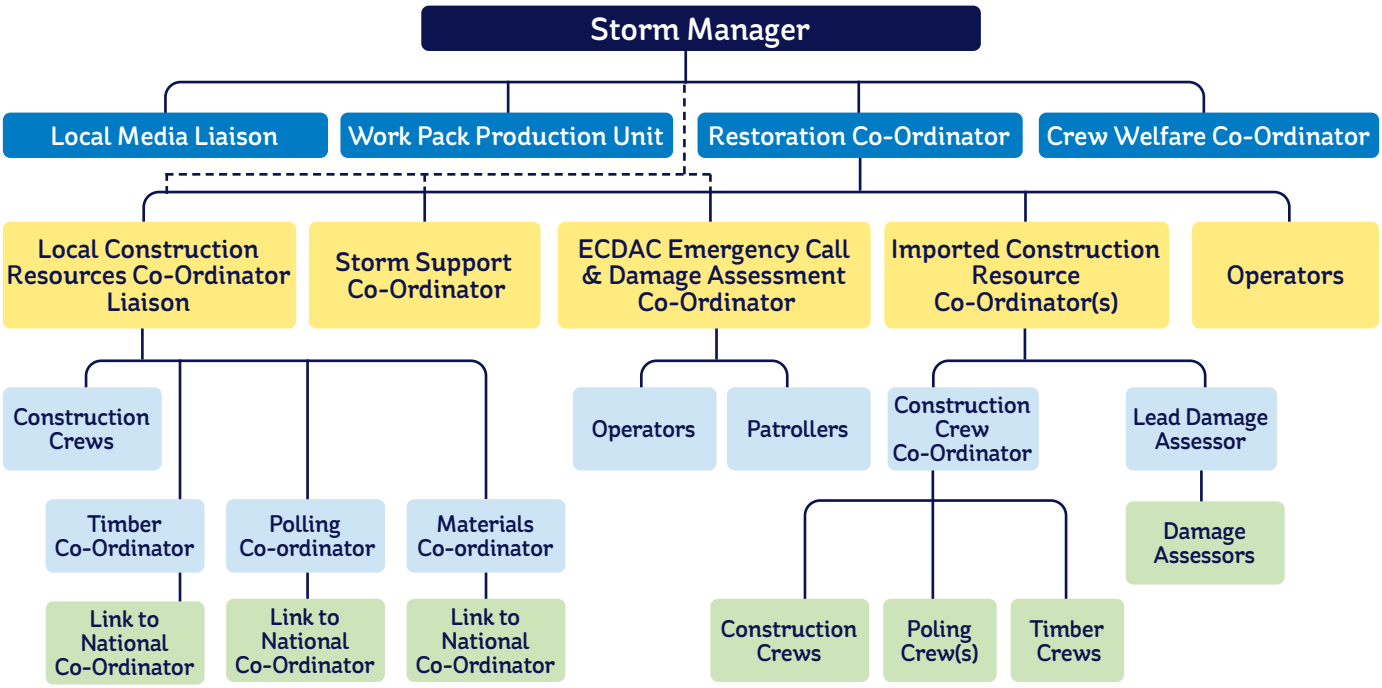
Figure 11 Organisational Structure for ESB Networks Regional Storm Response Organisation

As is set out in the Storm Plan, during Storm Éowyn, each role holder mobilised their own teams to prepare for the requirements of the role, with each of the six regional teams activating their local Regional Co-Ordination Teams upon instruction from the NERG.

1.2.3 Area Storm Response Organisation

The structure of the Area Storm Response organisation is represented in Figure 12. These local response teams were established in each of the 34 ESB Networks' planner groups when the red weather alert was received.

Figure 12: Organisational Structure for ESB Networks Area Storm Response Organisation



The implementation of the local area response plan requires a level of training and familiarisation. As part of normal winter emergency preparation and before any warnings of Storm Éowyn were received, 236 ESB Networks staff had already been trained or briefed on core local storm response management roles, including Storm Manager, Restoration Co-ordinator, Emergency Call and Damage Assessment Co-Ordinator (ECDAC) and Work Pack Producer.

The Area Storm Response teams' structures are scalable and allow for areas of responsibility to be sub-divided. During Storm Éowyn, the areas of responsibility were subdivided where the damage to the network was greatest, including the North Central, South Central and North West regions of the country. In total, 34 Storm Managers, 52 Restoration Co-ordinators and 45 ECDACs were deployed to manage restoration of supply to customers from the local depots, with further subdivision of storm areas taking place as the restoration progressed and repair works increased. As an example, the Tuam planner group which was badly impacted by Storm Eowyn was divided into four sub areas.

1.2.4 Storm Preparedness & Pre-Storm Resource Mobilisation

In the week preceding Storm Éowyn's arrival, ESB Networks closely monitored the developing storm using Met Eireann reports, forecasts received from Meteomatics, and briefings from the National Emergency Coordination Group (NECG). As the red wind warnings gradually escalated to encompass the entire country, ESB Networks mobilised its emergency storm management procedures and activated the National Emergency Response Group (NERG). All planned works were suspended, and the network was returned to a normal operational state, with all available electrical network put back into service to ensure maximum operational capacity and resilience. Fleet was refuelled, preliminary contact was made with ESB Networks' European colleagues, and materials were checked and prepared. Crews were pre-mobilised, and all control centre desks were opened to ensure maximum operational capacity. The National Customer Contact Centre (NCCC) Storm Response procedure was activated with additional customer call agents identified and trained in advance to handle the expected increased volume of customer interactions, with checks completed and reminders issued to ensure all systems were functioning correctly.

Further detail has been provided on these measures throughout this report.

1.2.5 ESB Networks Data and Digital Capability during Storm Éowyn

During the initial response to Storm Éowyn, the ESB Networks Analytics team provided significant support by assisting with coordination and visualisation of key storm restoration data sets. As a result, a number of analytics and reporting products were developed at speed for a range of stakeholders with a primary focus on outage location, customers affected and restoration analysis. This high level of digital capability was very impactful and ESB Networks should now further leverage this expertise, by including digital and data management in future storm preparedness.

Summary Findings

- The scale and duration of Storm Éowyn was unprecedented and unlike anything that ESB Networks experienced previously. Storm Éowyn caused a 93% increase in customer outages compared to the next largest storm experienced in ESB Networks' history, Storm Darragh.
- The majority of impacted customers were restored within the first 72 hours, with 90% of customers restored within one week of the storm. Restoration works lasted for 18 days after the storm, during which time, every effort was made to restore power to impacted customers as quickly as possible.
- The ESB Networks' documented business continuity storm plans and procedures were implemented successfully, with all required roles defined and filled.
- Pre-storm training had been completed prior to any warning of Storm Éowyn, and further training requirements were managed efficiently immediately before and during the storm.
- Effective interfaces were in place between the National Emergency Coordination Group and ESB Networks
- ESB Networks demonstrated its robust contractor frameworks by quickly mobilising partner firms to supplement internal staff with the storm restoration effort.
- ESB Networks demonstrated its strong relationships with international utilities, both through existing interfaces with the NEWSAC group and through its ability to request and receive additional assistance from other utilities across Europe.
- Across ESB Networks, the high level of available experience, capability and willingness to help resulted in agility and flexibility in responding to this extreme and unprecedented weather event.

Recommendations

- **Storm Preparedness #1**:
  ESB Networks should continue refining storm-related procedures based on learnings from Storm Éowyn, as it has after previous events, by confirming the availability of nominated role holders and the extensive volunteer resource pool ahead of storm season.
- **Storm Preparedness #2**:
  ESB Networks to further leverage its digital and data capabilities to enhance future storm preparedness and restoration efforts, through the planned development of a Storm Response Toolkit.

2

Customer Restoration Approach and Timeline

2 Customer Restoration Approach and Timeline

2.1 ESB Networks' approach to restoring power to customers during storms

At all times, ESB Networks prioritises the safety of the public. The necessity to protect public safety is heightened during a large weather or storm event when there is extensive damage to the electrical network resulting in dangerous situations such as low-lying or grounded live conductors. ESB Networks' crews will prioritise making the situation safe over maintaining supply. As a result, overhead lines, if they are still live following a storm, may need to be switched out until they can be repaired. During Storm Éowyn, this vital work unfortunately caused some confusion for customers who saw ESB Networks crews near their homes, and felt that they had left again without doing anything to restore supply. Reports of such dangerous situations to ESB Networks' Customer Call Centre are recorded on the Network Management System (NMS) as Extreme Danger or Hazard calls. The NMS system records the reported faults (including the hazard calls) and displays the total number of customers affected by the fault and other key information such as the Estimated Restoration Time (ERT), where available.

The priority is always to make reported public safety hazards safe. Once that has happened, crews are then dispatched to repair faults that will restore supply to the largest number of customers in the least amount of time. Where possible, usually for high-voltage faults, supply is restored remotely via the ESB Networks' National Distribution Control Centre (NDCC) using alternative circuits, where they are available.

Prior to initiating repair works in a particular area, ESB Networks carries out full assessments of network damage, so that power can be restored systematically and safely. As is the case with all electricity utilities, ESB Networks focusses initially on higher voltage transmission and distribution network, followed by medium voltage network, which deliver the biggest impact on customer numbers restored in the shortest repair time. As current flows down through the various voltage levels from generators to provide supply to customers at low voltage, it is imperative that these high and medium voltage circuits are repaired before more local faults – otherwise, supply cannot be restored.

The next step is to repair faults and damage to the low voltage network that serves smaller groups of customers and individual homes. It should also be noted that as faults are repaired on the higher voltages, faults that are present downstream on the lower voltages that have been masked by the upstream fault become apparent, so the entirety of the damage only becomes clear over time as faults are restored and/or reported.

Typically, restoring power to customers on the low voltage network is a slower process as there can be large numbers of small faults on a low voltage line serving a small cluster of customers. Due to the dispersed nature of the population, these sections of the network can often serve less than ten properties. Each individual repair could be as time consuming as a fault repair on the higher voltages (clearing fallen trees, debris, replacing broken poles, restringing conductor etc) but the large effort required will only restore power to a small number of customers who are served by that particular section of low voltage network.

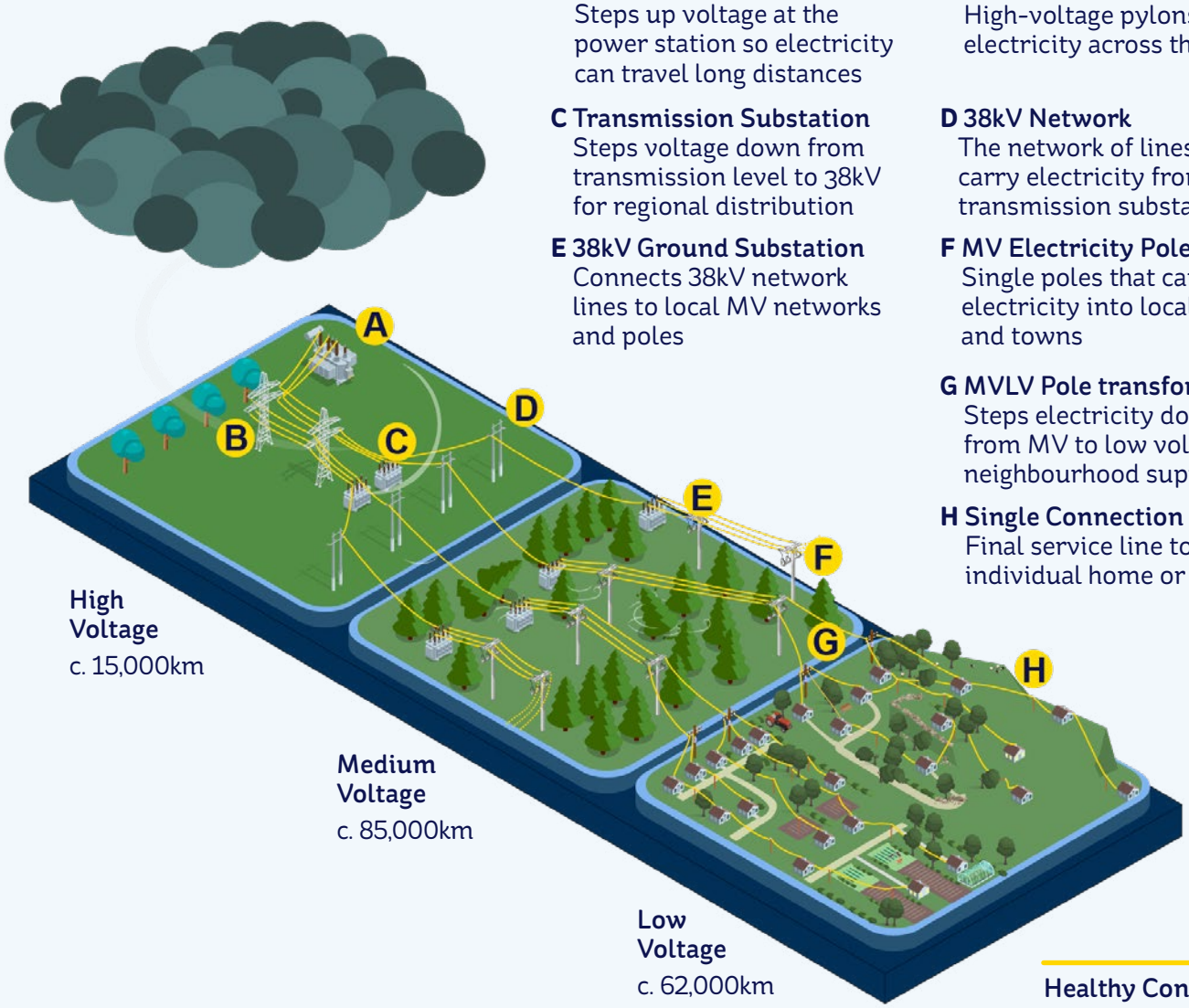
It should also be noted that as faults are being resolved, there may be a requirement to switch operational or restored sections of the network out to carry out repairs safely. This can result in customers, who have already had their power restored or who may not have been affected by storm damage in the first place, being switched out, and can also result in customers experiencing a number of power interruptions. This is typical and necessary in any fault repair scenario, but during major storm restorations, this can cause further customer upset and frustration.

Figure 13 illustrates ESB Networks' approach for storm restoration through the network voltages (High voltage to Low voltage), with some visual explanation of the impact experienced by affected customers during the restoration process.

Figure 13: ESB Networks Approach for Storm Restoration across the network voltages

Storm Hits

Storm Éowyn has damaged key parts of the electricity network – from high-voltage lines to local connections. Priority is given to public safety hazards such as fallen wires, before wider damage assessment begins. Some network is restored during this stage. Customers begin logging calls with the contact centre, with a large volume of Extreme Danger calls recorded.



A Power Transformer
Steps up voltage at the power station so electricity can travel long distances

B Transmission Lines
High-voltage pylons carrying electricity across the country

C Transmission Substation
Steps voltage down from transmission level to 38kV for regional distribution

D 38kV Network
The network of lines that carry electricity from the transmission substation

E 38kV Ground Substation
Connects 38kV network lines to local MV networks and poles

F MV Electricity Pole
Single poles that carry MV electricity into local areas and towns

G MVLV Pole transformer
Steps electricity down from MV to low voltage for neighbourhood supply

H Single Connection
Final service line to an individual home or building.

HV repairs underway

Specialist teams focus on restoring customers as quickly and as safely as possible by repairing Extreme Danger calls first, followed by high-voltage infrastructure. As HV faults are cleared, downstream faults on lower voltages become visible, giving a clearer picture of overall damage. Crews also work on lower-voltage lines near properties, making the network safe and removing hazards.

MV repairs underway

With higher voltages restored, crews move to medium- and lower-voltage networks. Progress is slowed where fallen trees block access – timber cutters and forestry harvesters must first clear paths. On some sites, forestry work continues for over five days, delaying electrical repairs and customer restoration.

LV repairs underway

ESBN continues to focus on restoring all customers. Repairs at the low-voltage level often require the same level of work as MV repairs, but restore far fewer customers due to the dispersed nature of the network. Teams work methodically through rough terrain and hard-to-reach areas to bring power back to every home.

2.2 Timeline of Restoration

January 24th – Storm Éowyn's Arrival

Storm Éowyn resulted in approximately one third of ESB Networks' customers losing supply.

Figure 14 shows the extent of this impact across the country by outlining the portion of customers affected in each of the ESB Networks planner groups. Figure 15 illustrates the timeline of events from before the storm, through to the restoration of all customers on February 11th. Further detail on each of these stages is provided.

Figure 14: % of properties in each of the ESB Networks Planner Groups without power at the storm peak on January 24th

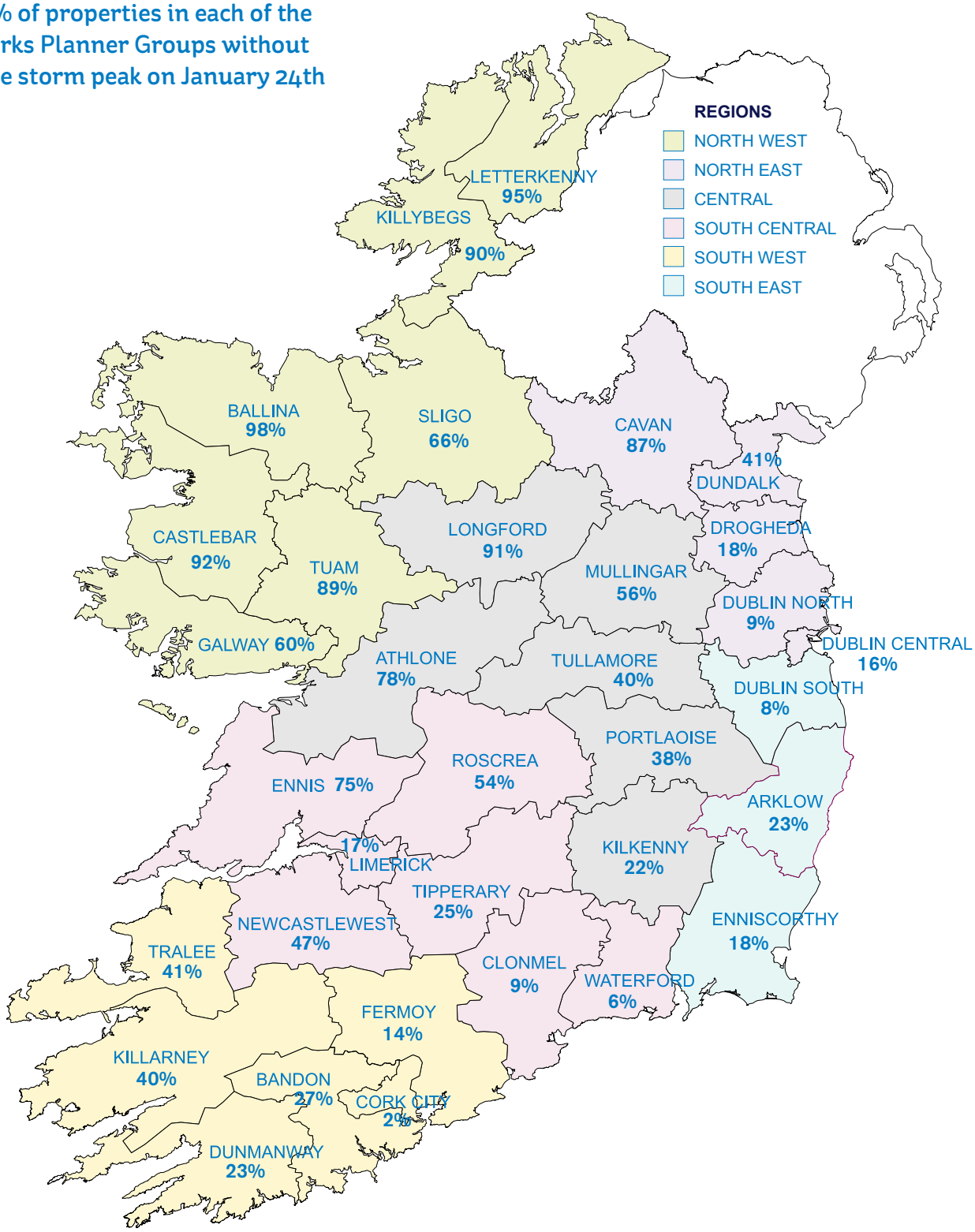
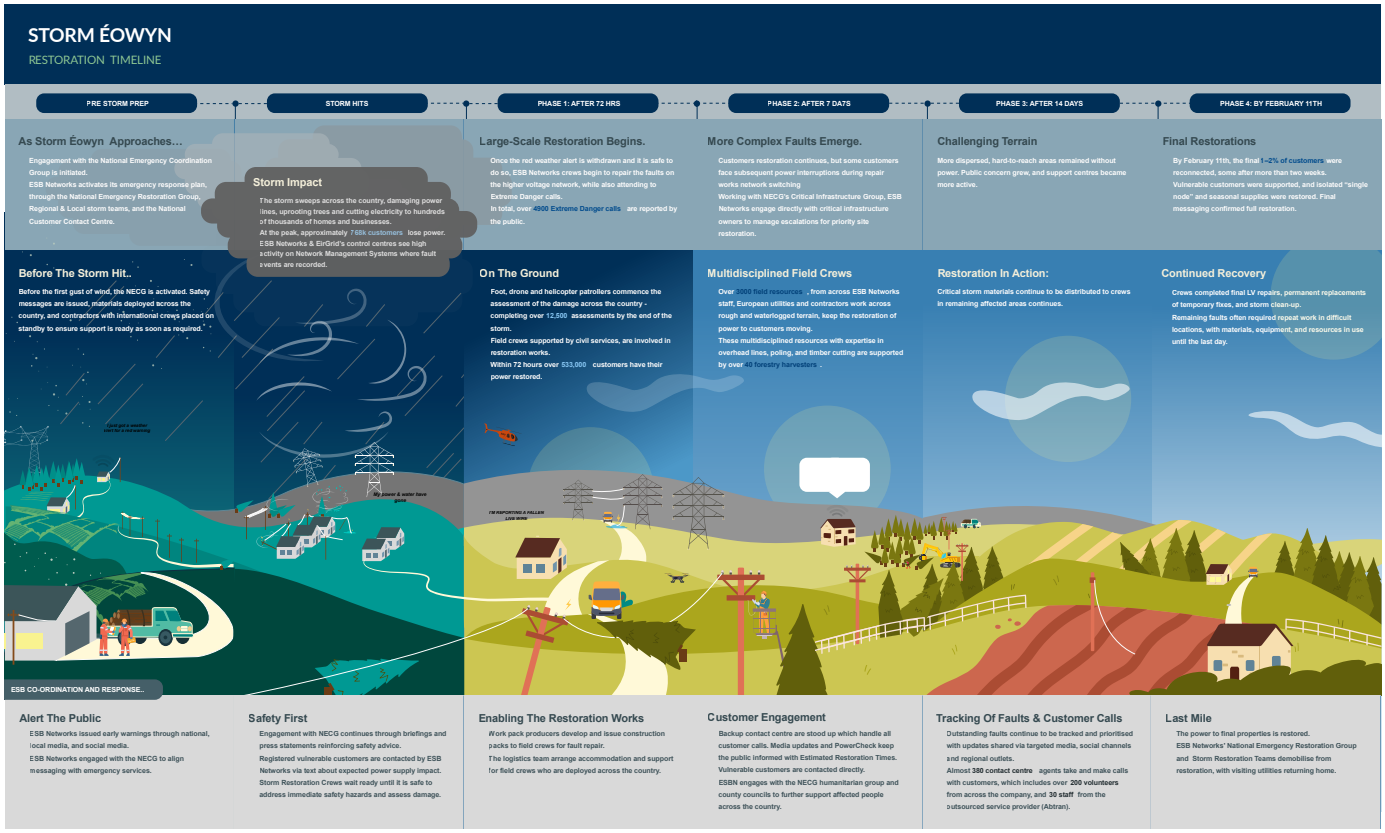


Figure 15: Storm Éowyn Restoration Timeline

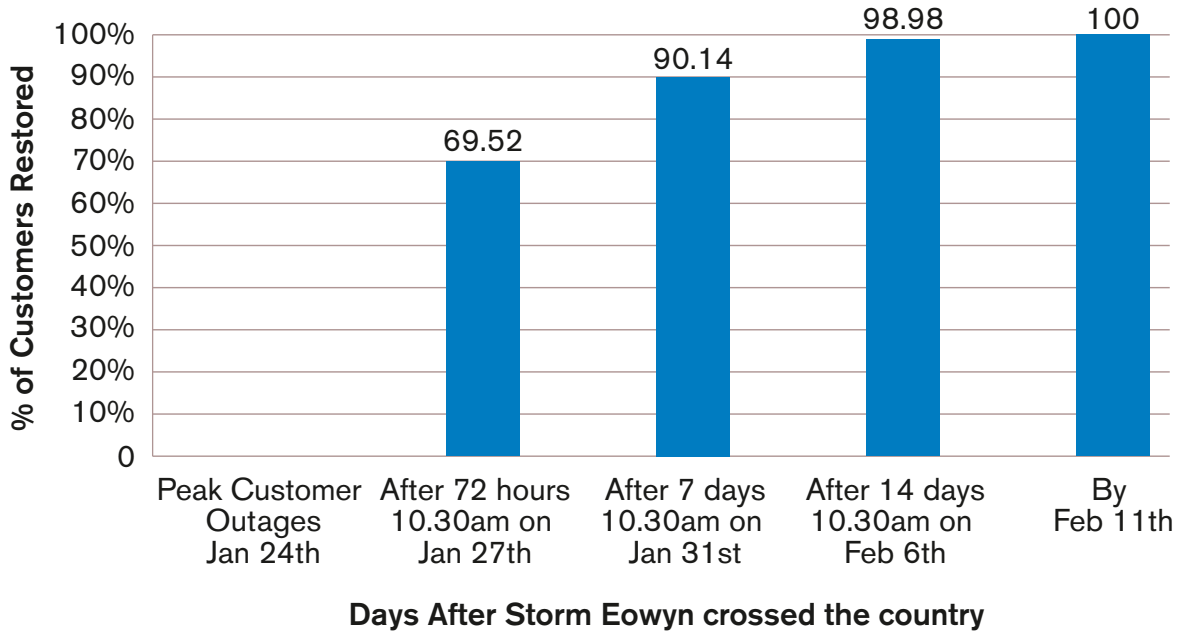


Appendix 1 contains the information depicted in this timeline in more detail

Phase 1: The first 72 hours after Storm Éowyn

Within 72 hours of the advent Storm Éowyn, over 533,000, or almost 70% of the peak number of customers impacted, had supply restored.

Figure 16: Timeline of Customer Restoration



As described earlier, ESB Networks prioritises the safety of members of the public during storm events. ESB Networks' crews were on site immediately after the storm passed, making the network safe and carrying out damage assessments.

When a customer reports a dangerous situation, such as a fallen conductor or broken pole, to the ESB Networks' Customer Contact Centre, the call is logged as an Extreme Danger call and sent to a local team for immediate follow-up. These calls are given priority due to the risk to public safety. As set out in the Regional and Area Storm Emergency Plan, an ECDAC (Emergency Call and Damage Assessment Co-Ordinator) will assign a Network Technician to attend the location in question, to make the situation safe and to carry out an assessment of the repair work required to restore supply. Over 4,900 Extreme Danger calls were logged during Storm Éowyn.

Over the years, ESB Networks has invested in remote-control technology and automation devices on the medium voltage network. This technology provides the ability to operate the higher-voltage networks remotely from the ESB Networks' Control Centre in Dublin and in certain situations, it also delivers the capability for self-healing operations to enable customer outages to be restored automatically without human intervention. These automated and remote-switching devices proved extremely beneficial during Storm Éowyn where a large proportion of customer interruptions were resolved through automatic reclosing and remote power restoration, minimising the overall interruption for a large volume of customers. The functionality provided by these devices resulted in a large volume of customer faults being resolved in the immediate aftermath of the storm. However, these devices are dependent on public mobile communications for their operation, and the impact of the storm on the mobile networks immediate, and in subsequent days as a result of lack of power at mast locations, compromised the ability of the Control Centre to remotely control the devices.

Despite the challenges, the technology on the electrical system played a large role in helping with the recovery effort.

On the first day of Storm Éowyn, there were approximately 4,440 incidents of tripping of circuit breakers (CBs), including multiple tripping, each responding to detected faults downstream and operating to ensure public safety and protect the electrical system from serious damage. Between 2am to 6am on January 24th, there were 2,620 Circuit Breaker Operations, which equated to a Circuit Breaker operating every 5.5 seconds over a 4 hour period. These CBs operate based on pre-set protection settings so that they can detect abnormal situations, such as a line on the ground or some foreign object (such as a tree) causing lines to clash, and open or trip to make the situation safe. While this safety measure can lead to widespread power outages, especially during storms, it is essential for protecting people who may be close to the location of the fault.

Phase 2: 4 to 7 days after Storm Éowyn
In the second half of the week following the storm, ESB Networks continued the restoration work focusing on the high and medium voltage networks to maximise the number of customers restored. In each area, once all faults on its high and medium voltage networks were repaired, the focus moved to the low voltage or local network near homes and businesses. This approach resulted in 90% of customers being restored one week after Storm Éowyn had passed through the country, despite the scale of the damage and significant amount of work yet to take place.

Phase 3: 8 to 14 days after Storm Éowyn
During the second week, the field crews continued to work on the repair of the medium and lower voltage network. A key point to note is that fault repairs on the lower voltage network generally require the same level of effort from field crews as those on the medium voltage network. However, unlike fault repair on the medium voltage network that restores power to many customers, a fault repair on the lower voltage often restores power to much smaller numbers of customers - in some cases, just a single customer. This is due to the dispersed nature of the Irish population, and the corresponding extensive nature of rural overhead electricity network required to serve that dispersed rural population. This is why it takes longer to restore customers that are connected to remote sections of the network, as there may be many faults between their property and the nearest primary substation, and all need to be repaired to restore supply. As the post-storm period progresses, while the field crews continuously repaired faults and damage to the LV overhead network at the same pace, the number of customers restored per fault repaired is typically much lower than in earlier stages of the restoration.

After the second week, on February 7th, over 98% of the customers affected by the storm had had their power restored.

Phase 4: Remaining days of Storm Restoration
Efforts to restore power to every customer affected by Storm Éowyn continued into the third week. Work also needed to continue after power was restored to all customers, as temporary repairs had been made to ensure safety and restore supply, but permanent repairs were still required. Power to all remaining affected customers was restored on February 11th.

3

Asset Performance

3 Asset Performance

3.1 Overview of Faults on the System across all Voltages

As described in earlier sections, Storm Éowyn resulted in significant damage to the electrical network and faults at all voltage levels, from the high voltage Transmission Network which brings high volumes of power across the country, to the distribution 38kV and Medium Voltage networks, and then to the Low Voltage network, to which most customers are connected.

The high voltage network is made up of the Transmission and 38kV network, which has approximately 7,000km and 5,600km of overhead lines respectively. The medium voltage network comprises of over 85,000km of overhead network, with an additional approximately 62,000km of low voltage overhead network feeding customers across the country. (For context, the circumference of the earth is 40,000km). Information on the fault impact of Storm Éowyn at each voltage level is described in the following sections.

3.1.1 Transmission Network Faults

A total of 103 transmission faults occurred across 39 transmission circuits - mostly in the West and North West. These faults included one on a 220kV line and one on a 400kV line. For a short duration, all of County Mayo was severed from the transmission system at one point during the storm. Counties Donegal and Sligo were also one transmission fault away from being totally electrically disconnected during the storm. This number of faults was unprecedented compared to previous storms. For comparison, Storm Darwin on 12 February 2014 resulted in 66 transmission faults, while Storm Ophelia on 16 October 2017 resulted in 16 transmission faults.

Table 4: Faults recorded on Transmission network for Storm Darwin, Storm Ophelia and Storm Éowyn

	Storm Darwin, 2014	Storm Ophelia, 2017	Storm Éowyn, 2025
Number of Transmission Faults	66	16	103

The majority of circuits were returned to service either during or immediately after the storm. However, a total of 15 transmission circuits remained out for a more protracted period, or were subsequently forced out after the storm due to reported damage, including one 400kV line. Due to the degree of redundancy of the transmission network configuration - in other words, supply is available via alternate circuits - other than the short duration outages experienced in Mayo, there was no impact on customer supplies as a result of the transmission faults.

Of the faults that occurred on the transmission system, seven were recorded as involving timber or forestry, where a fallen tree or branches had impacted the line. Other faults included leaning poles, which needed to be corrected by crews and specialist machinery.

Figure 17: Broken Pole, Galway (Cashla Cloon 110kV line)

Figure 18: Forestry Fault, Cavan (Rathrussan – Shankil 110kV line)

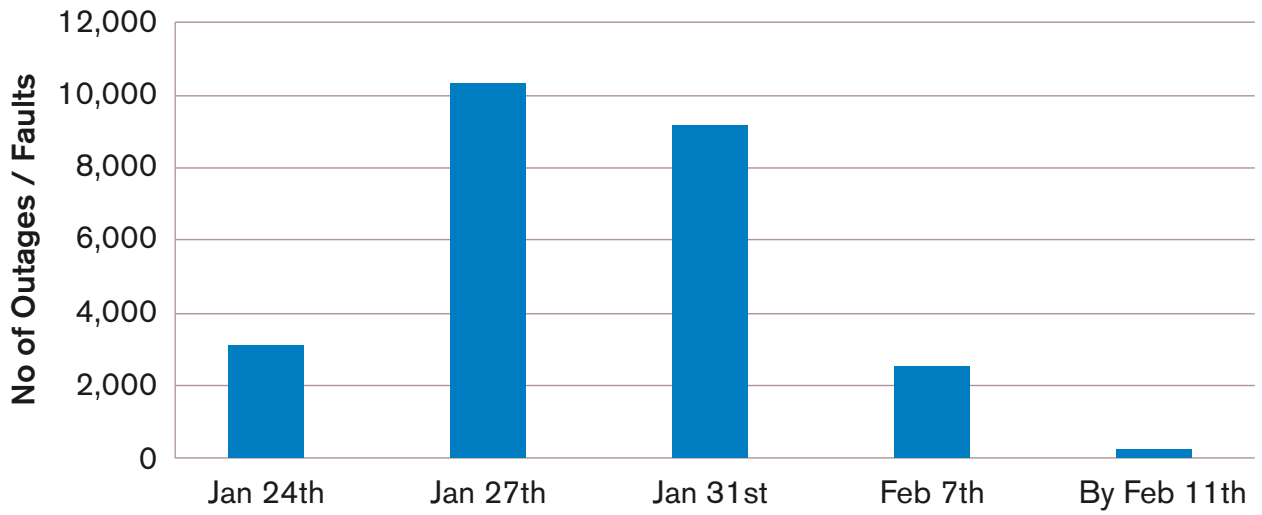
In order to return the transmission network to normal operation, there was ongoing engagement with EirGrid's teams to assess the faults and agree the prioritisation of fault repair, while balancing the need for repair and restoration of the distribution network. ESB Networks deployed its transmission crews to repair the identified faults, and as an additional precaution, given the importance of the transmission system, almost 5,000km of the transmission network was flown by helicopter to identify any residual hazards that needed to be addressed.

3.1.2 Distribution Network Faults

ESB Networks' Network Management System (NMS) provides data on the total volume of faults on the distribution network and customers impacted at any point in time.

Figure 19 outlines the volume of outages that remained on the NMS system at the end of specific days during the storm. While there were over 23,000 events recorded on the NMS system between the evening of Thursday January 23rd as the storm was approaching and the end of the restoration period, the graph in Figure 19 shows that the maximum number of outages open on the network at any one time was on January 27th, 3 days after the storm hit the country, with over 10,000 outages active on that day. As network is repaired on the higher voltages and this network is brought back into service, additional faults that are on the electrical network downstream that are masked by an upstream outage then become apparent. An upstream outage can mask multiple down-stream faults. These outages are then identified on the NMS system and this results in the increase in the number of faults being recorded in the days after the storm, event as repairs are completed and the number of customers affected reduces.

Figure 19: Outages/Faults Recorded on Network Management System



3.1.3 Fault Analysis on the 38kV Network

123 different circuits recorded faults on the 38kV network. A breakdown of the recorded cause of the faults is shown in Table 5.

Table 5: Faults recorded on the 38kV network

Fault Cause	Number of circuits at 38kV network
Faults involving Hedgerow Timber / Forestry	45
Faults involving Broken poles, insulators, jumpers	36
Faults involving Clashing spans / Clashing conductors	34
Faults caused by other issues	8

As outlined in the table, and as illustrated in the photos below, in many cases, the faults on the 38kV network were due to fallen trees on the sections of the network that run through forestry, causing significant damage to wood poles and conductor. A number of wood poles were also damaged due to the ferocity of the winds in exposed locations, where no hedgerow timber or forestry was involved.

Figure 20: Broken Conductor on 38kV network (Aghamore – Ballymahon 38Kv)

Figure 21: Leaning pole on 38kV network (Cathleen Falls 38kV)

Figure 22: Forestry impacting fault on 38kV network (Castlerea – Raheen Bar 38kV)

Figure 23: Forestry impacting fault on 38kV network (Loughrea – Sonnagh 38kV)

3.1.4 Fault Analysis on the MV and LV Network

As the majority of the faults occurred on the MV and LV network, ESB Networks has carried out deeper analysis of the faults on these network voltages to gain insights that will help to prepare for future weather events. The following pages provide an overview of the findings from this analysis. However, an explanation of the approach for this analysis, including the data used, is first provided in the next section.

3.1.4.1 Data Used for Fault Analysis on MV and LV Network

During Storm Éowyn, there were over 23,000 events or calls logged on the ESB Networks' Network Management System (NMS). In addition, there were approximately 4,440 Circuit Breaker (CB) trips on 24th January alone, which includes individual CBs tripping multiple times.

The NMS system automatically records key fault metrics, including timestamp, duration, location, and affected customer numbers. However, not all logged events reflect faults requiring intervention, and additionally some circuit breaker operations were unrelated to Storm Éowyn, stemming from non-storm related network activity. Recording fault cause and asset data requires input from the crews in the field, which must be manually added when closing a fault. Due to the extreme volume of faults and activity in trying to restore almost one third of the network as quickly as possible, updating of the system beyond essential data is challenging. As a result, understandably, asset information recorded during Storm Éowyn is not as complete as during normal operations, so carrying out a full analysis of fault causes or asset failures based on the NMS data alone is somewhat compromised.

In order to carry out further analysis, the damage assessments completed by patrollers was used. For the faults where onsite repair work was required, the ESB Networks' Damage Assessment Application has been used. The primary purpose of each entry logged in the application is to record the actual work required on site to restore the power. Each recorded damage assessment allows the teams of staff who prepare the repair-work packs to ensure the right numbers of resources with the appropriate skills and materials are deployed to the specific fault. It is not intended as a primary means of capturing asset information for future analysis, and therefore it is limited in the amount of information it provides. Despite this, there is a wealth of useable data within the damage assessments (including photographs) to allow information to be extracted and to reach some conclusions on the nature of the faults.

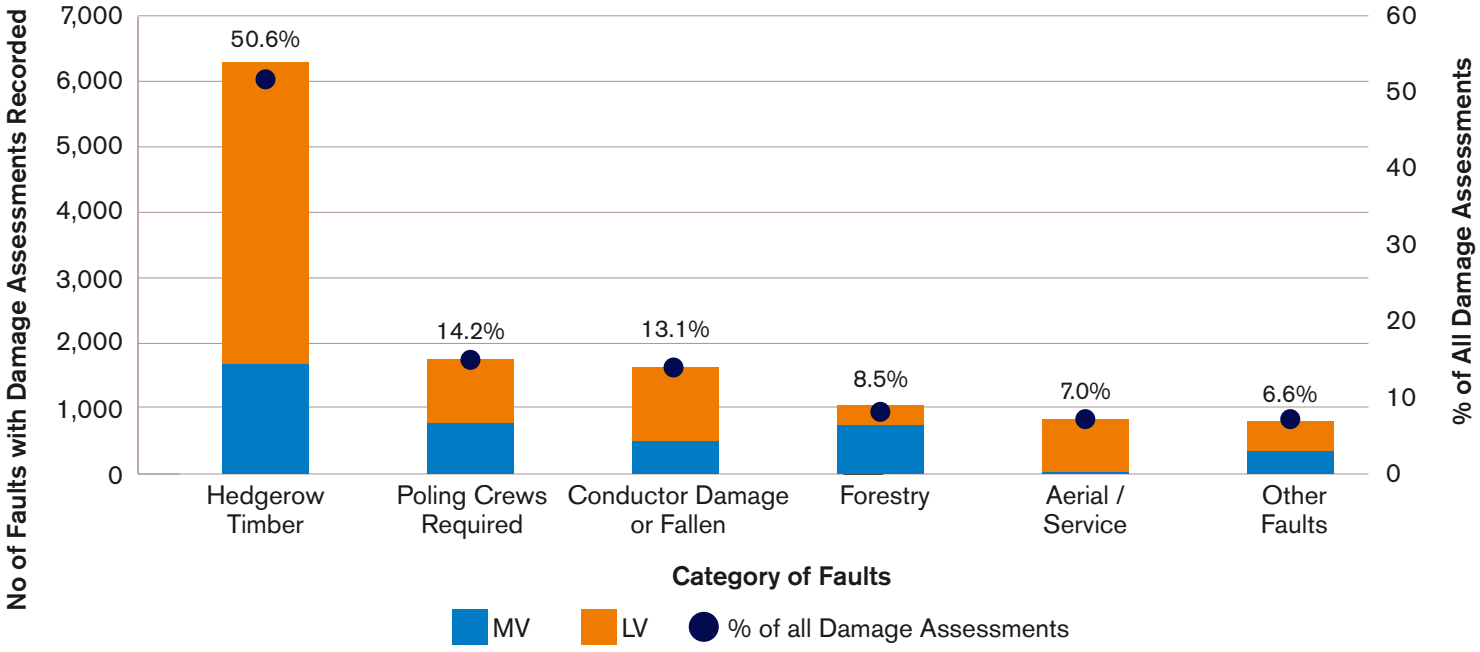
Some faults logged on the NMs system did not require a physical repair and therefore did not have a damage assessment completed.

As part of the Storm Restoration stage, over 12,500 damage assessments were completed and recorded through the Damage Assessment Application, covering faults on the low and medium voltage networks that needed repairs, with a small volume completed for 38kV network faults.

For this exercise, the review team carried out analysis of the information available within the submitted damage assessments.

Figure 24 presents the output of the recorded Damage Assessment data.

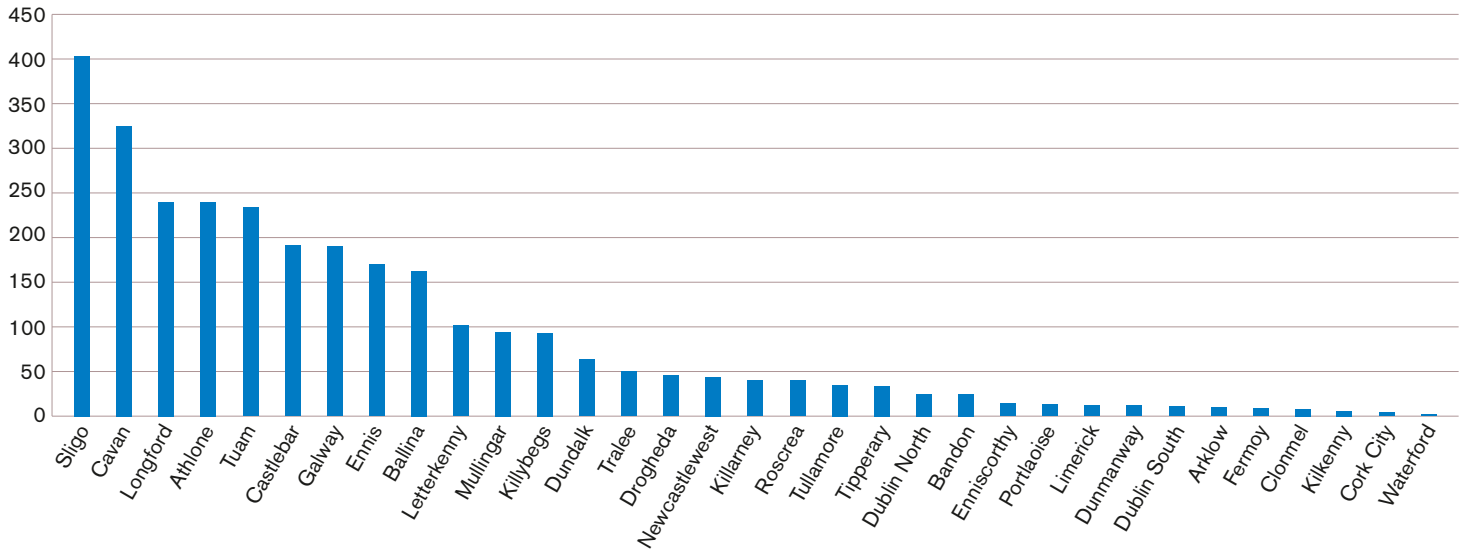
Figure 24: Summary of Data related to Primary Damage recorded in the Damage Assessments completed for over 12,500 faults



In over 59% of cases, hedgerow timber or forestry was recorded as the primary cause, with just over 50% relating to hedgerow timber, and over 8% related to forestry. Some further analysis of the hedgerow timber issues reported that a large proportion related to trees falling on the network. For the other 40%, where hedgerow timber or forestry wasn't recorded as the cause, the main damaged asset was recorded (e.g. broken conductor, damaged pole). Within some of these damage assessments, photos and commentary / notes indicate that the fault was due to external factors such as debris, but the information recorded focuses on repair of the network equipment, and not the cause.

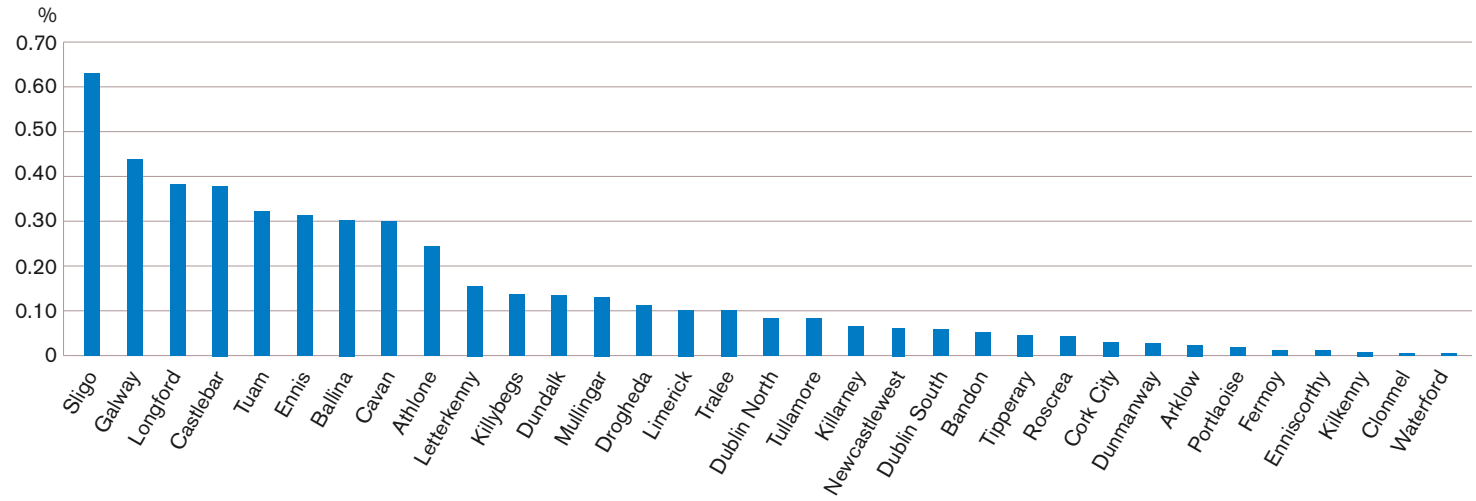
Further review of the damage assessment data, as outlined in Figure 25, showed that approximately 28%, or 3,550, of the damage assessments recorded that poling crews were required to complete the fault repair, with many requiring multiple poles for each repair. However, as outlined in Figure 17 above, a subset of the total damage assessments (14.2%) recorded that poling crews were required for the repair but did not have a clear fault driver identified or recorded. Equally, across the various faults that have been categorised by either damaged asset or fault driver in Figure 17, poling crews were also called for in many, but not all, of these faults.

Figure 25: No. of Damage Assessments that called for Poling Crews in each ESBN planner groups



Based on the poles called for in the damage assessments, Figure 26 illustrates an estimated percentage of MV poles replaced in each of the ESB Networks planner groups.

Figure 26: Estimate % of MV poles replaced in each ESBN planner group



Only a small portion of the damage assessments referenced a specific NMS call / fault, which means it isn't possible to correlate all fault / repair works to the customers affected by the fault. This is an area of data capture that needs to be addressed to allow improved analysis of storm events.

Conclusions:

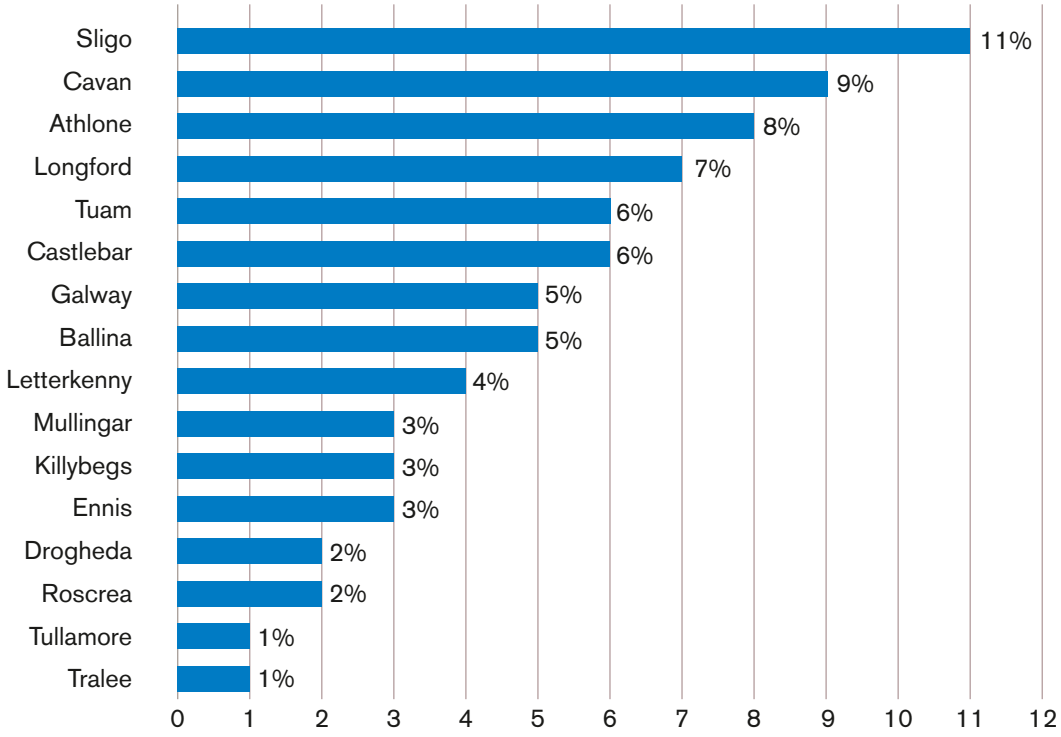
1. Hedgerow Timber and Forestry accounted for over 59% of faults with hedgerow timber accounting for over half (~50%) of the faults across all of the damage assessments completed, with over 8% relating to forestry.
   a. Approximately 73% of the hedgerow timber faults were on the Low Voltage network.
   b. Approximately 72% of the forestry related faults were on the Medium Voltage network. These faults took longer to repair due to the requirement for harvesters to clear the access and fallen trees to enable the overhead line and poling crews to gain access to the fault location to repair the damage.
2. 28% of the total number of damage assessments completed called for poling crews, indicating poles were required to be replaced or straightened. A subset of this volume, approximately 14% of the damage assessments, involved replacing or straightening a pole, where the damage to the pole was not attributed to forestry / hedgerow timber and there is no other clear driver / cause of the fault recorded.
3. Almost two thirds of all damage assessments completed (over 8,000) related to faults on the Low Voltage (LV) Network.
4. Approximately 37% of all damage assessments completed were recorded as hedgerow timber at the LV network.
5. Approximately 7% of damage assessment entries were recorded as faults on aerials / services equipment on the LV network, with no hedgerow timber or forestry involved.
6. Over 1,200 damage assessments were recorded as electrical conductor down or damaged where the issues could not be attributed to hedgerow timber, forestry, or broken poles.
7. There was over 900 damage assessments recorded as faults at the MV network where the fault could not be attributed to hedgerow timber, forestry, or broken poles.

3.1.4.2 *Damage Assessment Data for Hedgerow Timber Related Faults*

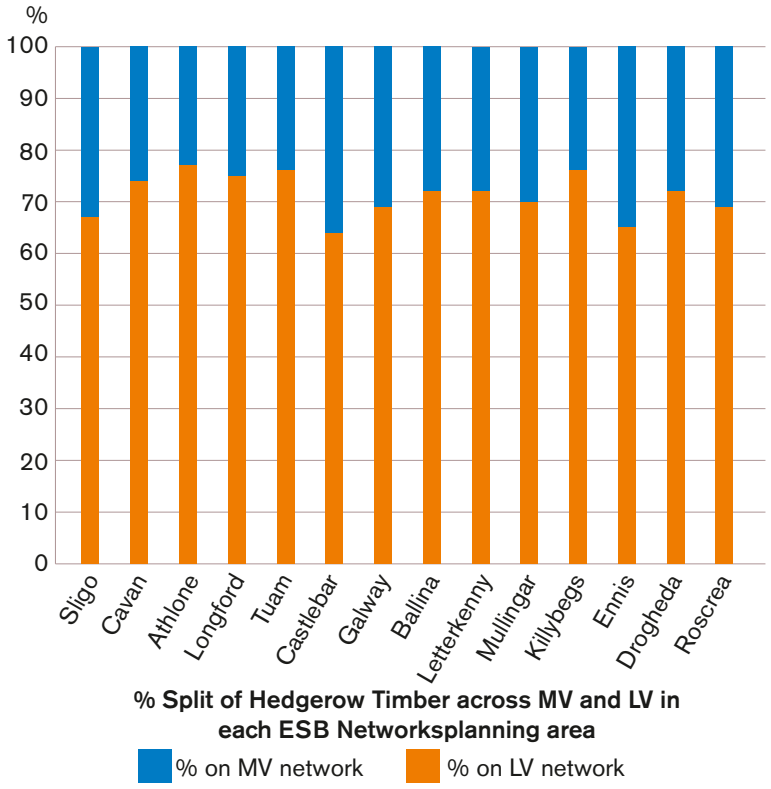
Hedgerow timber accounted for approximately 50.6% of faults where a damage assessment was completed. From the graphs below it can be seen that a higher volume of these hedgerow timber related faults was concentrated in the worst impacted areas and particularly affected the Low Voltage network.

Figure 27: Output of Damage Assessment Analysis relating to Hedgerow Timber issues

A further analysis was carried out on a randomly selected portion of the damage assessments of the hedgerow timber faults. Based on the description of repair works required, along with the photos taken of the damage, it was found that of the 50.6% where hedgerow timber was the primary cause, approximately 70% were due to trees falling on the network. This analysis is based on a 95% confidence level, with a +/-5% margin of error.



% of all Damage Assessments with Hedgerow Timber recorded



% Split of Hedgerow Timber across MV and LV in each ESB Networksplanning area

Challenges arising from fault repairs involving Hedgerow Timber

A fault that involves hedgerow timber that has fallen on electrical infrastructure usually calls for a multidisciplinary team to complete the repair. Timber cutting contractors are required to remove the trees, and in some extreme cases harvesters may be required. Poling contractors may then be needed to stand any poles that need to be replaced, in many cases multiples of poles, with overhead lines crews subsequently required to replace and commission the conductor and electrical equipment, along with support from network operations teams to switch in the network. Some example faults from Storm Éowyn are outlined below.

Example #1: Hedgerow Timber Fault Repair at Medium Voltage network

Hedgerow Timber Fault Example #1	Elphin, Co Roscommon
Voltage	Medium Voltage Network (10kV)
Description	Falling tree on MV line - electrical network sustained the impact without requiring any poles to be replaced
Crews Required	1 x Timber Crew for trees removal / cutting 1 x Overhead line construction crew to replace damage insulators, stay wires, and other electrical equipment installed along the section of network.
Time to Repair	Two crews for estimated ~0.5 day

Example #2: Hedgerow Timber Fault Repair at Medium and Low Voltage network

Hedgerow Timber Fault Example #2	Co. Galway
Voltage	Medium Voltage Network (10kV) and Low Voltage Network
Description	Falling tree on LV line – electrical services equipment damaged at the customer property, and LV electrical network affected causing further impact upstream on the MV electrical network
Crews Required	1 x Timber Crew for trees removal / cutting at LV network 1 x Poling crews to re-stand the poles on the MV and low voltage network 1 x Overhead line crews to repair the affected conductor and associated equipment from the MV network, along the LV network, all the way to the customer's property.
Time to Repair	Two crews for estimated ~0.5 day

Example #3: Hedgerow Timber Fault Repair at Medium Voltage network

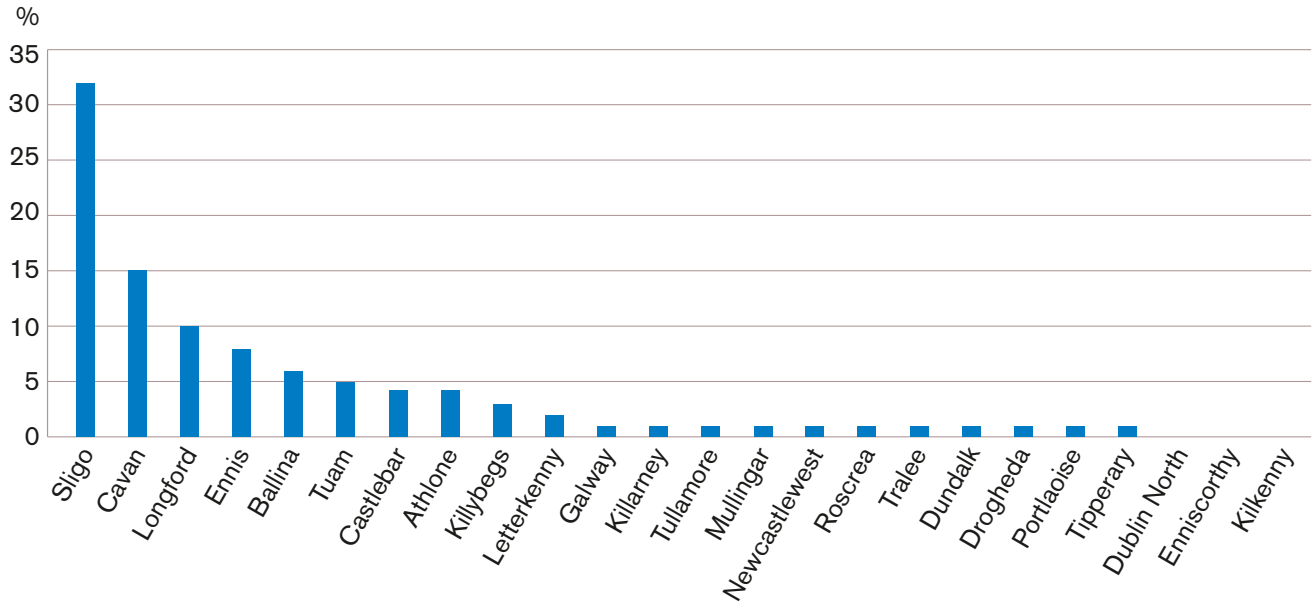
Hedgerow Timber Fault Example #3	Drumkeeran, Co. Sligo
Voltage	Medium Voltage Network (10kV) and Low Voltage Network
Description	Large trees fell onto the Low Voltage network close to a customer's property driving repair work to the LV network
Crews Required	1 to 2 Timber Crews for trees removal / cutting at LV network 1 x Overhead line crews to repair the affected conductor and associated equipment along the low voltage network.
Time to Repair	Two crews for estimated ~0.5 day

3.1.4.3 Damage Assessment Data for Forestry Related Faults

In many areas across the country where the winds impacted most – particularly in the North, West, and Northwest - there are large concentrations of forestry. This combination of high forestry density and severe winds impacted large sections of electrical network running through forestry in these areas.

The graph below shows that across these geographical areas where there are larger volumes of network routed through forestry, there was a higher number of damage assessments citing forestry as the cause of the faults. As referenced in the introduction, the Sligo planner group covers an area that includes Sligo, Leitrim and North Roscommon.

Figure 28: Percentage of all Forestry Recorded Damage Assessments across each ESBN planner group



% split of Forestry recorded issues in each ESB Networks planning area

3.1.4.4 Challenges arising from Fault repairs in Forestry

Fault repairs in areas of forestry typically require a significantly higher-than-normal volume of multi-skilled resources for longer periods, including damage assessors, network operators, timber cutters, and particularly harvesters, poling contractors (with required track machinery) and overhead line construction crews. In addition to the onsite resource requirements, there is a significant overhead resource required to plan, direct and organise the repairs on network routed through forestry. Forestry also tends to be in poorer land, where access for machinery can be challenging, particularly in wet conditions.

During Storm Éowyn, the average time taken by the harvesters to clear access and remove the trees at a single site before the electrical crews could carry out the electrical repair, was three days. Some individual repairs involved up to seven days of harvester effort. In some cases, customers were dependent on the repair of the network at multiple sites affected by trees within forestry, resulting in significantly protracted power restoration times. In many cases, the repair following damage from forestry involved a full rebuild of the entire section of network that was damaged.

Figure 29: Examples of the effect of Storm Éowyn on areas of Forestry

Example #1: Forestry Fault Repair at Medium Voltage network

Forestry Fault Example #1	Co Leitrim
Voltage	Medium Voltage Network (20kV)
Description	Falling trees on MV line in dense forestry area - electrical network sustained the impact without requiring any poles to be replaced.
Crews Required	Harvesters required for trees removal and access. Overhead line construction crews to replace damaged conductor (wires) and other electrical equipment installed along the section of network.
Time to Repair	Estimated 3.5 days for harvester, followed by overhead line crews.

Example #2: Forestry Fault Repair at Medium Voltage network

Forestry Fault Example #2	Co Sligo
Voltage	Medium Voltage Network (20kV)
Description	Falling trees on MV line in dense forestry area - electrical network sustained the impact without requiring any poles to be replaced. Additional challenges involved in accessing fault location
Crews Required	Harvesters required for trees removal and access. Overhead line construction crews to replace damaged conductor (wires) and other electrical equipment installed along the section of network.
Time to Repair	Estimated 3.5 days for harvester, followed by overhead line crews.

Example #3: Forestry Fault Repair at Medium Voltage network

Forestry Fault Example #3	Co Roscommon
Voltage	Medium Voltage Network (10kV)
Description	Falling trees on MV line in very dense forestry area - electrical network sustained the impact and required pole replacements and pole straightening following significant harvesting work. Additional challenges involved in accessing fault location.
Crews Required	Harvesters required to remove estimated 500m of trees. Poling contractor to replace poles and straighten poles. Overhead line construction crews to replace damaged conductor (wires) and other electrical equipment installed along the section of network.
Time to Repair	Over 7 days for harvester, followed by overhead line crews.

3.1.4.5 Estimated Effort to Repair Fault Types involving Timber Cutting and Forestry Harvesting

The harvesting crews spent a total of 556 workdays working to clear forestry during Storm Éowyn in the main affected areas, working on approximately 200 different sites. With some of the sites taking a couple of days to clear, the figures show an average of just under 3 days to complete an individual site before the electrical network could be repaired, but several sites took up to 5 days of harvesting work, and some even longer.

Comparing this to the faults involving hedgerow timber, where approximately 5,900 of the damage assessments called for timber crews, the timber crews supporting ESB Networks during Storm Éowyn spent a total of over 4800 workdays cutting various levels of timber in advance of, or in conjunction with, the electrical network being repaired. The average time required to complete timber cutting on a site was estimated to be just less than 1 day per site.

Figure 30: Sample of forestry clearing activity in Ballinlough, Co.Roscommon

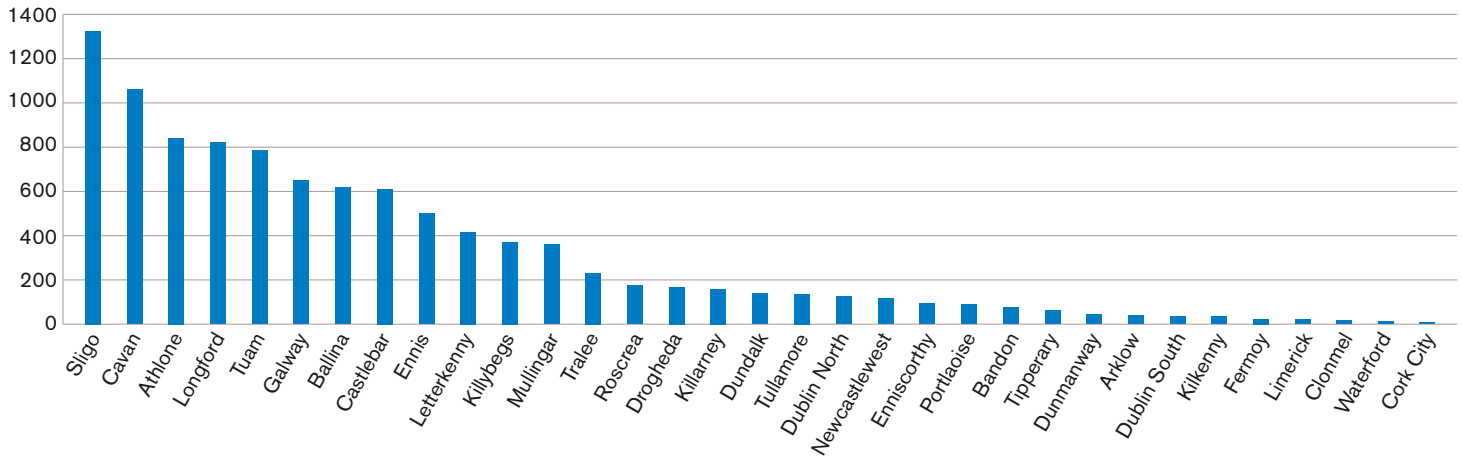
3.1.5 ESB'S Statutory Powers for addressing forestry and hedgerow timber along the network

ESB's existing statutory powers enable ESB Networks to lop or cut any tree, shrub, or hedge which obstructs or interferes with the electricity network. These statutory powers do not enable ESB Networks to lop or cut trees, shrubs or hedges that may - in the future - obstruct or interfere with the network. Likewise, there is currently no statutory framework which prohibits landowners from planting trees within voltage-specific distances of existing and new electricity lines and/or that requires landowners to clear and maintain certain voltage-specific corridors for overhead electric lines. This means, in effect, that ESB Networks may only remove trees, shrubs, or hedges which may in the future obstruct or interfere with an electric line if it has the relevant landowner's permission to do so. While ESB Networks continues to invest in timber cutting programmes and will seek to address the dead or weakened trees presenting risk to the network due to the falling distance and proximity to the line, consideration needs to be given to (i) extending ESB's statutory powers so as to enable the removal of trees, shrubs, or hedges which are identified as presenting a future risk to the network and (ii) introducing statutory requirements obliging landowners to clear and maintain certain voltage-specific corridors for overhead electric lines. As of the date of publication of this report, a Heads of Bill has been approved by Government for the introduction of legislation to put forestry corridors on a statutory footing. ESB Networks welcomes this and will continue to engage with all stakeholders on this topic.

3.1.6 Analysis of Fault numbers against Storm Conditions / Wind Speed

Figure 31 describes the volume of faults that called for repair works through completed damage assessment across each of the ESB Networks areas. On review of the gust wind speeds that were experienced across the country, there is correlation between the higher wind speed experienced, and the volume of faults experienced on the network in these corresponding areas.

Figure 31: Number of Damage Assessments logged across each ESB Networks Planner Group



3.2 Performance of the ESB Networks Telecoms network that provides Control and Visibility of the Electrical Network

ESB Networks owns and operates an extensive private telecommunications network to enable monitoring and control of the electrical network, via the SCADA (Supervisory Control and Data Acquisition) system, by both ESB Networks' National Distribution Control Centre and EirGrid's National Control Centre. The ESB Networks telecommunications network comprises radio and optical fibre-based technology installed in over 770 high voltage transmission and distribution stations across the country. The telecoms network is managed and operated from a 24 x 7 Telecoms Operations Centre in Dublin.

During Storm Éowyn, the telecoms network management systems recorded over 340,000 network events from 10:00pm on 23rd January to 11pm on 24th January 2025. A network event is any operation, unique data update or alarm in the network management system and not necessarily leading to service degradation or failure. The count of network events peaked between 7:00 - 8:00am on 24th January, with over 36,000 events recorded in a one-hour period.

Overall, the ESB Networks' telecommunications network performed as expected during Storm Éowyn, with only two major incidents reported, both caused by prolonged loss of mains electricity supply in locations where there was no back-up generator on site. A number of other smaller issues occurred impacting communications and remote-control functionality from the Distribution Control Centre to thirteen of the population of over 500 38kV stations.

Separate to the ESB Networks-owned telecommunications network that provides the communication basis for the SCADA monitoring of the higher voltage networks, ESB Networks also utilises public mobile communications to provide connectivity to thousands of reclosers and automation devices installed on the MV network. The loss of public communications impacted the remote operation of these devices as the connection to the Control Centre was lost.

3.3 Supervisory Control and Data Acquisition (SCADA) events

Enabled by the performance of the telecommunications network, during the first 24 hours of the storm, the activity on the ESB Networks' network management systems used by the Control Room Operators in the ESB Networks Control Centre reached unprecedented levels.

The main SCADA system that is used to manage and operate the electricity network recorded 161,452 events on January 24th, its highest ever number of events. This high level of activity continued in the Control Room for the duration of the storm, as support was provided to front-line teams by carrying out remote operations and providing information.

Significant volumes of automatic and remote operations of the HV and MV circuit breakers was observed. These actions resulted in restoration of supply to large volumes of customers on un-faulted network and tripping of faulted network to ensure safety of the public.

The huge volume of SCADA events and circuit breaker operations demonstrates the significant and critical role played by technology, communications and the Control Room Operators in managing the significant volume of faults and subsequent restoration safely during Storm Éowyn.

Summary Findings

- Overview of faults and performance of assets;
  - The high voltage transmission network experienced a greater number of faults than in previous storms, including one fault on each of the 220kV and 400kV networks, marking an unprecedented impact compared to previous storms like Darwin and Ophelia. However, the transmission network is designed with redundancy, so that a single fault on any specific circuit will not impact on customers.
  - The pole population across ESB Networks' distribution network performed very well with only approx. 4,500 poles requiring replacement out of a total population of 2.4 million poles (approx. 0.2% of ESB Networks poles).
  - The strength, condition and construction quality of ESB Networks overhead network conductor also performed very well, with recorded conductor damage in just over 4,800 locations involving on average 2 to 3 spans (or sections), resulting in approx. 160km of faulted conductor from a total 147,000km of overhead conductor across the MV and LV overhead systems nationally.
  - On the first day of Storm Éowyn, there were approximately 4,440 incidents of tripping of circuit breakers (CBs), including multiple tripping, thus restoring power to large volumes of customers immediately following intermittent faults or after fuses blew downstream, without the need for human intervention.
- Of the faults where a damage assessment was completed, approx. 59% of faults across all voltages involved trees or forestry impacting the medium and low voltage network.
- The highest volume of tree-related faults was on the low voltage network, which is the connection voltage for most customers. In contrast, fallen hedgerow timber in forestry plantations mainly impacted the Medium Voltage network. ESB Networks' management of trees, shrubs or hedges adjacent to the network predominantly involves a safety clearance cut, rather than removing the tree entirely, with existing legislation permitting ESB Networks to cut trees that are currently impacting the line but not those with the potential to do so in future.
- ESB Networks' Network Management System (NMS) and the Supervisory Control and Data Acquisition System (SCADA) performed very effectively despite the huge volume of faults and data they had to process. These systems were central to the restoration effort.
- The ESB Networks' Telecommunications network that provides the communications channels for the SCADA system to both ESB Networks Control Centre and EirGrid's National Control Centres performed very well.
- The installed and mobile back-up power at ESB's telecommunication sites was effective in maintaining operation of the sites where mains power was interrupted.

Recommendations

- **Asset Performance #1**
  ESB Networks to continue engagement with stakeholders on legislation for hedgerow timber management and forestry corridors where there is potential for trees to impact on the electrical network. ESB Networks will continue to progress plans to grow the company's timber cutting contractor capacity and will continue to engage with landowners to address hedgerow timber and forestry issues that present a risk to the electrical network.
- **Asset Preparedness #2**:
  ESB Networks to complete a review of design standards for the distribution network, and to continue engagement with the Transmission System Operator, EirGrid, on the proactive design, development, and maintenance of the transmission network. Asset replacement programmes based on cyclic condition assessments for poles and conductors should continue into PR6 and beyond, whilst the introduction of new technologies and materials to further enhance grid resilience is examined and progressed.
- **Asset Preparedness #3**:
  Based on reviews of previous weather events, interactions with international utilities and discussions with the visiting crews during Storm Éowyn, ESB Networks believes that while the impact of severe weather events can be mitigated, given the extent and nature of our network the full impact of a major storm event cannot be entirely eliminated. In addition, though like-for-like comparisons are difficult given the variation in windspeeds and affected geographies, and differences in the extent and nature of the networks, it appears that ESB Networks' restoration performance has historically compared well with other countries. However, there is always scope for learning and improvement. ESB Networks will therefore continue to review how international utilities have responded to severe and impacting weather events to reduce the residual risk. Specifically, the company will complete an international review of utilities and the decisions made by these utilities in the aftermath of large weather events.
- **Asset Preparedness #4**:
  ESB Networks should carry out a review of data capture for faults in the Network Management System to assist with the ongoing improvement of network resilience planning, and wider storm related benefits.

4

Resource Mobilisation

4 Resource Mobilisation

Any storm event will generally divert existing resources from various parts of the business to carry out defined storm restoration functions and tasks, and will also put pressure and strain on normal business-as-usual activities. For Storm Éowyn, as for other previous major storms, all available resources were entirely focused on the restoration of supply to affected customers right across the country, until all customers were restored.

This section will describe the resources involved in these storm response functions, but in addition to the defined roles or those visible to the public, enormous effort was made by other resources right across the business, both before and during a storm, to support those on the front line, to ensure the various support structures were in place outside normal business hours and to provide those supports over an extended period of time.

Over 1,400 ESB Networks' Network Technicians were involved in repair works, with over 1,100 people involved in the damage assessment stage immediately after the storm, which included many of the Network Technicians and various other people from across the organisation. The internal field repair works were supplemented by over 1,650 external resources from contractors, visiting international utilities and retired staff. In addition, a team of almost 500 volunteer staff from across the business carried out critical roles such as work pack production, logistics planning for crews, stakeholder communications, liaison with European utilities and management / supervision of onsite field crews. Information on the resources involved in our National Customer Contact Centre and external communications is covered in Section 5.

The majority of the staff involved in the various power restoration efforts, whether in the field, within the Contact Centre or in critical enabling roles, worked extremely long hours each day over an extended continuous period from in the days leading up to the storm right through to when the final customers were restored. Many of the staff involved also did not have power in their own homes so their immediate and extended families had the same serious inconveniences as the general customer base, and for the same length of time as others in their localities.

To all the staff, contractors, utilities and organisations that worked tirelessly in the aftermath of Storm Éowyn, ESB Networks expresses its genuine gratitude for the commitment and dedication shown in restoring power to every affected customer.

4.1 Resources Involved in Restoration

Once measures are taken to address and remedy public safety and extreme-danger situations in the immediate aftermath of a storm, as outlined in Section 2, the typical restoration process involves two stages; damage assessment and repair scoping, followed by onsite network repair for customer power restoration. During Storm Éowyn, there was a significant number of resources involved in each of these stages, as described in the following sections.

4.1.1 Stage 1 - Damage Assessment & Repair Scoping

ESB Networks deployed a range of highly skilled and competent resources for network damage assessment to accurately assess the extent of the damage and to determine the repair works required. This work then fed into the process of scoping and packaging the work pack and materials for each onsite repair.

Foot Patrol based Damage Assessment

Due to the anticipated scale of Storm Éowyn, a larger number of damage assessors than has ever been deployed during previous storms were identified in advance and deployed as soon as it was safe to do so. 12,500 damage assessments were completed by over 1,160 staff and contractors deployed throughout the country. As a comparison, during Storm Darragh in December 2024, 635 staff and contractors completed 2,765 damage assessments. The staff involved in damage assessment came from many parts of the organisation, external to ESB Networks, including a large number from ESB's Engineering & Major Projects business unit.

Learnings from previous storms has seen improvements applied to the Damage Assessment Stage, with digital tools developed to assist in the recording of damage and required repair works. While in Storm Éowyn, almost double the number damage assessors were deployed, each person also completed, on average, 4.5 times more damage assessments than during Storm Darragh. Each damage assessment included a description of the damage, details of the location and asset type involved, resources required for the repair, and photos of the damage on site. Due to the level of skills and competency of the resources carrying out damage assessment, in some cases, temporary repairs could be carried out to make the situation safe and / or to restore supply to customers.

Helicopter and Drone Usage for Network Inspection

For large scale storm events, ESB Networks typically draft in helicopters to fly and inspect the network, working from the 400kV lines down to the 38kV lines, in the storm-affected areas. The 38kV system had unprecedented damage during this storm, particularly in the West and Northwest and the use of helicopters allowed the faults to be assessed and catalogued quickly. Given the scale of the damage national, helicopters were also used to assess damage on the Medium Voltage network to supplement the foot patrols, proving very beneficial in remote and harder-to-reach areas, such as in dense forestry. Drones were also used to supplement the foot patrol assessments on the Medium Voltage network.

Helicopter Patrols

ESB Networks deployed six helicopters to carry out inspections of the network. On Friday 24th January ESB Networks had initial access to four helicopters, three from a private operator, and one provided by the Air Corps. In the following days, two additional helicopters were sourced – one via an Irish contractor and another being provided by a UK-based company.

In total, over 800 sections of the network were flown, totalling approximately 10,700kms of High Voltage overhead lines, along with over 300km of MV network. This was a very efficient way of carrying out necessary patrols to assess and record the damage but can only take place once winds have abated sufficiently to fly safely. Table 6 outlines the extent of high and medium voltage network that was the subject of helicopter patrols between January 24th and February 12th.

Table 6: Sections of network flown by Helicopter for inspection and damage assessment

Voltage	Lines Flown
400kV	1
220kV	5
110kV	252
38kV	574
10/20kV	23

Drone Survey Technology

To assist patrollers and damage assessors in evaluating the fault damage in the worst affected areas, particularly where fault locations were difficult to access, drone technology was used.

A number of ESB Networks' staff members who are trained and licenced in the use of drones by the Irish Aviation Authority (IAA) utilised drones for assessing damage. In addition, third parties, such as the Civil Defence and drone companies that had pre-existing framework contracts with ESB Networks were also deployed. In each case, the drone operator was accompanied by an ESB Networks' damage assessor, who directed the flight path, assessed the data captured and completed the necessary damage assessment forms.

Work Pack Production

Work Pack Producers were responsible for documenting the required repair work associated with a fault outage, so that detailed information could be provided to the field crew. Each fault outage had already been assessed by an on-site damage assessor, using the ESB Networks' Damage Assessment App to document the requirements. This information was then reviewed by a Work Pack Producer to allow them to develop a comprehensive construction work pack for the Construction Resource Co-ordinator. The work pack included essential information - for example, electrical network maps, materials, and resources required - to allow the work to be completed effectively, efficiently and safely, using the correct resources with the appropriate skills.

During Storm Éowyn over 9,000 work packs were produced by a team of over 100 people, spread throughout the country. The staff who carried out this work were mainly comprised of clerical and engineering officer teams, who have a high level of experience, are familiar with the work and who are trained on the Network Management System, ESB Networks GIS system (GNetViewer) and the Storm Damage Assessment App. These resources also have Storm Response Training and are extremely familiar with the overall storm restoration processes.

4.1.2 Stage 2 - Field Based Repair Works

ESB Networks has a strong and capable team of field resources, with a wide range of skills and competence. All available ESB Networks field resources were deployed during Storm Éowyn. However, before and during the early stages of the storm, it was evident from the nature and volume of the faults that ESB Networks would require extra support from other ESB business units and from outside the company. . The resources that supported the restoration efforts can be categorised across four main groups.

- Internal ESB Networks' field crews – both current field staff and those with previous training and experience
- Framework contractors (Overhead Lines, Poling, Timber cutters, Forest harvesters)
- Visiting international utility crews
- Other internal resources (including retired staff)

The number of resources continued to grow as the restoration effort progressed. At the peak there were over 3,000 resources in the field, directly involved in the restoration of power to customers. Safely coordinating and directing such a large volume and blend of resources, many of whom were totally unfamiliar with the geography in which they were working, required careful management, and a number of key resource coordinating roles were assigned for this purpose. As per the ESB Networks Storm Plan, during Storm Éowyn, field resources were coordinated centrally by the National Resource Coordination Team.

As described previously, the resource management process commenced in the days leading up to the storm, utilising information for all available field resources, in addition to close engagement with regional delivery managers and field crew supervisors and some advance calls to UK utilities.

As the damage assessment was carried out and the extent of the required repair works was beginning to unfold across the country, each Storm Manager provided their resource requirements to their Regional Resource coordinator, who in turn channelled their requirements for additional resources to the National Resource Coordination Team.

Using the data available on the volume of faults / network outages along with the number of customers impacted, the extent of the damage and customer impact was assessed centrally, and resources were assigned by the Resource Coordination Team to the worst affected storm areas. The crews remained mobile throughout the restoration and travelled across the country as required. The Resource Coordination Manager is a crucial role, and throughout the restoration they met daily with key internal stakeholders to ensure smooth deployment of all resources across the country, engaging with the those who managed the complex logistics and welfare arrangements for the crews.

Our storm plan sets out the deployment of multidisciplinary teams in "Units" as the most effective means of managing resources. Each unit includes overhead lines, poling, timber cutting, and network operations resources. An overview of these various resource types is described below.

Internal ESB Networks Field Crews
During each day of Storm Éowyn, over 1400 ESB Networks' Network Technicians were involved in the storm restoration. This included all overhead line crews, and in addition, Network Technicians who normally work in high voltage stations or on the underground network were also involved. Storm Éowyn affected all areas of the country on Day One of the storm and unlike previous localised storms where the crews from less affected areas could be immediately deployed into badly-affected areas, all internal ESB Networks crews were involved first in making the network safe and carrying out damage assessment of the network in their own area, and subsequently completing fault restoration, again in their own area first.

As the less affected areas progressed with fault repair and power restoration, the Resource Coordination Team began to prepare for the redeployment of internal resources to worse affected areas. Nationally this redeployment of resources began on Day 4 of the restoration stage.

Framework Contractors and Visiting Utilities
For storms of significant scale, additional resources are brought in to support the storm restoration stage, as is required, with the volume dependant on the scale of the damage caused. This comprises a mix of resources with different capabilities. Table 7 outlines the external resources utilised in Storm Éowyn, with further detail on each resource type captured in subsequent sections.

Table 7: External Resources that supported ESB Networks restoration efforts

Resource Type	No of Resources
Framework Contractors Overhead Line Crews and Poling Contractors	Over 550 crew members
Timber Contractors	Over 450 crew members
International Utilities	Up to 648 resources - 588 OHL crew members and approx. 60 supervisory/support staff
Total Additional Resources	1648* external (non ESBN) crew members **figures taken at peak when highest volume of resources were utilised*
Forestry Harvesters	50 harvesters and track machines

Framework Contractors - Overhead Lines and Poling

Both overhead lines resources and poling resources from eight construction contractors and 66 poling contractors were available and utilised. Each framework contractor had multiple crews which were deployed to different storm areas, with supervision and support provided from ESB Networks.

Framework Contractors - Timber Cutters

In the early stages of the restoration, timber cutting crews were assigned to each area affected. As the damage was assessed and the requirement for timber crews was determined across the country, crews were re-deployed to the worst affected areas, from areas where the lower volumes of hedgerow timber clearance was completed. At the peak, close to 500 timber crew members from across 16 companies supported the restoration, including additional timber cutters brought in from the UK.

Forestry Harvesters

Due to the significant damage caused by fallen trees in areas of forestry, in addition to the regular timber contractors who are contracted to ESB Networks, harvesting contractors, equipped with track machines, diggers and shears, were also required during this storm. Over 50 harvesters and track machines were involved in the clearance of corridors to allow repair on the impacted network be carried out.

Visiting International Utilities

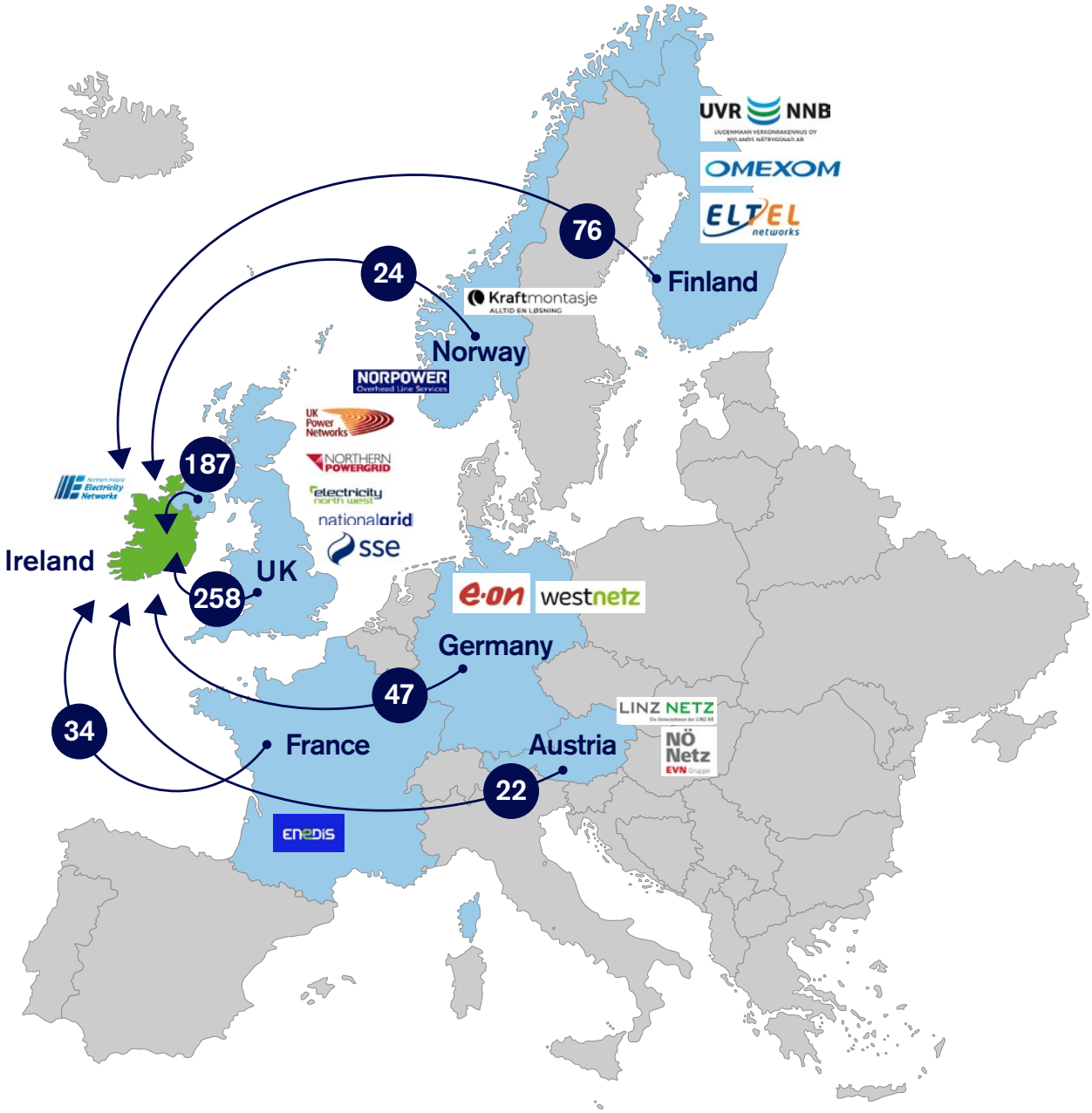
ESB Networks is part of a mutual aid association called NEWSAC (North, East, West, South Area Consortium) which is comprised of electricity companies in Ireland and the UK. These companies provide mutual aid to support in the aftermath of storms and other emergency situations at pre-agreed rates. ESB Networks has previously supported restoration efforts abroad, including Storm Arwen in 2021, where 24 ESB Networks staff travelled to the UK, and also in 2023 where over 50 staff travelled to France to support restoration efforts following Storm Ciaran.

A formal request was submitted to NEWSAC for support to aid restoration on January 22nd. In addition, due to the scale of the damage, on January 24th ESB Networks approached utilities across Europe through the European association of DSOs; E-DSO.

Support from the UK was forthcoming from a number of companies, including National Grid Electricity Distribution, UK Power Networks, Electricity North West, SSE South & North, and Northern PowerGrid, along with Northern Ireland Electricity, who also provided significant support after their own repairs were under control during the second week after the storm. The European companies that provided assistance included E.ON and their sister company Westnetz (Germany), Eltel (Finland), Enedis (France), Kraftmontasje/Powerline (Norway), Linz Netz (Austria), Netz Niederösterreich (Austria), Omexon (Finland and their Scottish partner Norpower), and UVR NNB (Finland), as illustrated below in Figure 32.

The first crews from the UK were inducted two days after the storm hit, on Sunday January 26th. The support received from across these companies was extremely valuable, in particular the speed at which they responded, and ESB Networks expressed their immense gratitude to all companies for the help provided, particularly those who had never been to Ireland for any previous storm events but responded to the call for help without hesitation. Following Storm Éowyn, several of the visiting utilities expressed interest in future collaboration to understand the underlying structures supporting ESB Networks restoration and safety approaches, with a number of post storm engagements both completed and scheduled.

Figure 32: International support to ESB Networks during Storm Éowyn



Additional Resources

Finally, a number of retired ESB Networks employees volunteered to return to ESB to provide help in the restoration efforts. These previous staff members were re-briefed, assessed and approved to support in various ways, including damage assessment, supervision and operational / field-based roles. Many had vast knowledge and experience with storm restoration efforts from their time working with ESB Networks, and their support in the restoration was considered by ESB Networks to be very positive addition to the overall restoration.

4.1.3 Integration of External Resources

Determining who can work on electricity network is tightly controlled for reasons of staff and public safety, and so the crews who access the network for operation and repair are required to be appropriately trained with adequate experience. While receiving support from other entities is essential and their willingness is greatly appreciated, bringing in new field crews who are not experienced with ESB Networks' electrical network and associated safety rules and procedures and furthermore, not familiar with the geography and not having English as a first language, can take significant supervision, which, if not managed effectively could present safety issues or have an impact to the overall efficiency of the restoration effort. In the past, visiting crews have typically joined an ESB Networks crew and carried out their work under the direction of an ESB Networks-approved Person in Charge of Work (PICW). The volume of repair work in Storm Éowyn meant that the demand for PICW's to facilitate efficient restoration was high, so a new approach was required. Therefore, ESB Networks undertook an initiative to enable crews from NIE and Great Britain, who had the competency and experience, to work more independently, in accordance with their own Electrical Safety Rules and Safe System of Work, without direct supervision by ESB Networks staff, and with minimal support from ESB Networks' Network Technicians. This initiative was limited to work on Medium Voltage and Low Voltage tail-fed network only, but this aligned with where ESB Networks required the most support.

While the output of this initiative proved to benefit the overall restoration, on the ESB Networks' side, significant effort was required over a short timeframe to carry out the mandatory risk assessments, develop required procedures, and complete necessary training. It also required a change to the ESB Networks' Electrical Safety Rules, with some of the assisting utilities requiring an amendment to their own safety rules to be implemented. While a lot of effort was required from all in involved, the collaborative approach resulted in a new safety procedure being developed which enabled field crews from both UKPN and NIE to carry out some work independently, further maximising their capability. It also enabled ESB Networks field resources to be deployed elsewhere, making the best use the resources available.

While the same approach was not fully possible with the visiting European field resources, due to the lack of pre-existing agreements and lack of experience working on ESB's network, these crews were integrated with ESB Networks' staff, increasing the overall capability of the crews and level of repair resource available.

The application of this Electrical Safety Rules procedure for UK/NIE crews worked very well and should be expanded, where possible, to visiting international crews, where the required assessment deems the pre-requisite competency level to be met. In some cases, sufficient levels of essential tools/equipment required to work on the networks were not available to the visiting crews, such as earths, operating rods etc. The development and availability of storm toolboxes, similar to the dedicated storm materials, for use by visiting crews should be considered.

4.1.4 Management of Framework Contractors and International Utilities

Significant support was provided from across ESB, both within ESB Networks and more widely from other ESB business units, particularly from the Engineering and Major Projects business unit, in the overall management of framework contractors and international utilities. This additional support provided direction on works required, ensured materials were supplied accurately and efficiently to the fault sites, and provided general oversight to the best deployment of the external resources. Like all support received during Storm Éowyn, these highly experienced members of staff stepped away from their normal duties to provide dedicated support to ESB Networks throughout the period of restoration.

4.1.5 Logistics Planning for Supporting Field Resources

Logistics planning to support field resources was an integral part of deploying resources to the worst affected areas of the country. As part of the pre-storm planning, a resource team was established to coordinate accommodation, food and other needs – because without these services, the additional field crews could not function where they were needed most. The coordination team was mainly comprised of experienced clerical support staff in the worst affected planner groups, who knew the local geography, hotels and other businesses. The team arranged accommodation throughout the country each day, depending on the movement of the crews' work locations and had to adjust plans depending on the availability of accommodation. This was a major undertaking, as all visiting crews required food and accommodation as close as possible to the work location.

During the peak of the restoration period, the logistics planning team booked over 1,170 hotel rooms per day. This task was very complex due to the ongoing movement of the crews into different areas of the country, and it was made more challenging due to the restoration efforts crossing over weekends, including a bank holiday, where during normal times securing accommodation in Ireland can be difficult, as a result of weddings and other functions.

4.1.6 Resource Demobilisation

Resources were maintained, as required, until the end of the restoration period to ensure focus continued on the remaining affected customers, with international crews being released first so that they could travel home, followed by the contractor crews and then ESB Networks resources transitioning back to non-storm normal construction activities. Demobilisation of resources was managed and communicated locally through Storm Managers and Regional Managers, with the worst affected areas, as expected, demobilised last. Following customer restoration, there is a final stage of work required, to return to sections of the network where temporary repairs had been made, and to complete permanent repairs. In some areas, releasing resources to transition back to normal planned operations too early may have delayed the completion of all permanent repairs fully.

4.2 Restoration Performance

4.2.1 Previous Storms

Storm Éowyn compares very well to the restoration performance in previous storms, with a clear improvement in planning and restoration performance detected as a result of lessons learned and changes implemented since Storm Darwin.

When compared with Storm Darwin, 124% more customers were restored during Storm Éowyn, in only 22% more time (comparing on the basis of time taken to 90% of customers restored). When compared with Storm Ophelia, 93% more customers were restored during Storm Éowyn, taking only 18% more time to reach the 90% customer restoration level.

Table 8: Number of days to restore 90% of Customers

Storm	Peak Customers Off	Customers Restored to 90%	No of Days where 90% of customers power was restored
Darwin	342,001	307,801	5.88
Ophelia	395,763	356,187	6.08
Éowyn	767,568	690,811	7.19

4.2.2 Use of ESB Networks Generators to support the Restoration Effort

ESB Networks' overarching strategy is to maximise the pace of restoration of the electricity network and deployment of all available network resources to do so. In some instances, generators are deployed where it is required to support a specific requirement on our network.

Potential locations for generators were identified during the storm through the assessment of specific areas of the network. In total, twenty-two 3-phase mobile generators were sourced and deployed, in addition to six single phase generators, and they were used at critical points along the network.

4.2.3 Use of Smart Meters in Customer Restoration

Towards the end of the restoration efforts, when the remaining customers without power were dispersed in rural, very-low-density locations, the use of data from smart meters was piloted by ESB Networks to enhance information on remaining outages. The objective was to utilise the smart meter data to provide more granular information than is available on the Network Management System, and to update the customer outage numbers where the smart meter data was showing power to be restored. Confirmation that power was restored was verified directly with customers by the agents in the back up Contact Centre, which in turn, allowed the Network Management system to be updated.

While careful consideration is required on how to implement this approach within the storm restoration process to ensure that faults are not closed where repair works are still required, this initiative proved very beneficial in the updating of fault locations and in prioritisation of resources to the areas of network where the customers were still offline.

4.2.4 Storm Restoration in Major Storms outside Ireland

For further comparison purposes, restoration of major storms outside Ireland has been reviewed and a summary of the findings are captured in the table below. What is not presented in this table (due to lack of available data) is the size of the organisation that responded to the storm. While ESB Networks utilised all available resources during Storm Éowyn, a further review should be carried out to understand the capacity and restoration performance across other utilities. However, in the context of the scale of the impact to customers, no other utility has experienced as proportionately large an outage impact to their customer base as in Ireland due to Storm Éowyn.

Table 9: Comparison of Restoration Efforts between Éowyn and other large European Weather Events

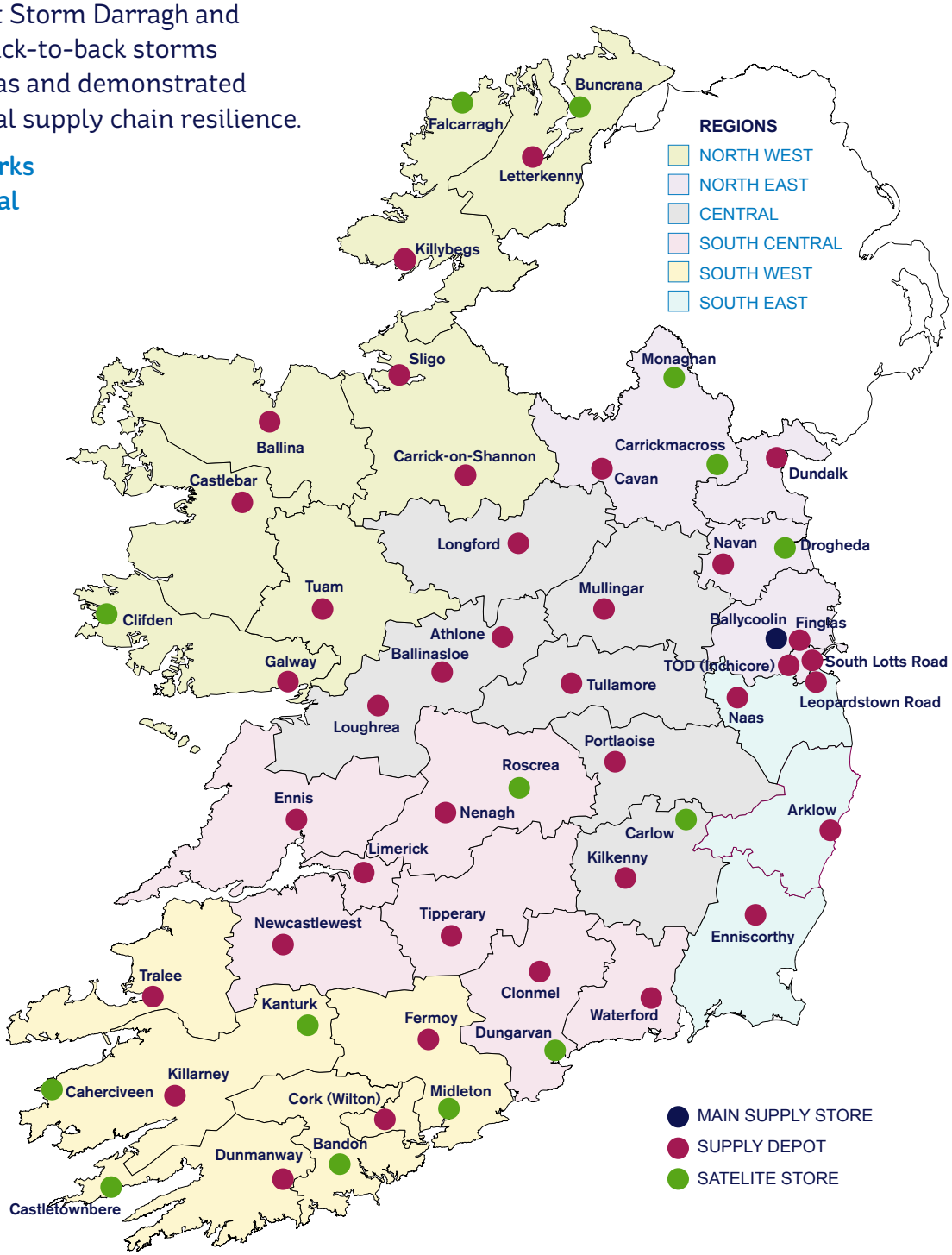
Storm	Date of Storm	No of Customers Affected (without power)	% of Total Customers Affected (without power)	Days to restore 90% / 95% of customers affected?	How long did the overall / total restoration take?	Reference
Storm Gudrun, Sweden	Jan 2005	730,000	14%	Not confirmed	~ up to 20 days	Impacts of Natural Disasters on Swedish Electric Power Policy: A Case Study by Niyazi Gündüz, Sinan Küfeolu, Matti Lehtonen
Storm Dagmar, Norway, Sweden Finland	Dec 2011	1,700,000	14.8%	~90% after 1 day	~ 10 days (Norway) ~ 25 (Finland, Sweden)	CIRED: Major storms review paper, Kjolle, Kyte, Tapper and Hanninen 22ndInt Conference on Elec Distribution, Stockholm June 2013
Storm Arwen, UK	26 Nov 2021	1,000,000	3.1%	~90% after 2 days	~over 10 days	Ofgem Final report into Storm Arwen, June 2022
Storm Ciaran, France	2 Nov 2023	1,200,000	3.5%	~95% after 5 days	~ almost 2 weeks	Enedis press release 11 Nov 2023. France24.com news report 2/11/23. EDF Annual Results 2023
Storm Éowyn	24 Jan 2025	768,000	30%	~7 days	18 days	

4.3 Supply Chain (Materials)

ESB Networks operates an extensive supply chain operation, with a centrally located main stores for all material in Dublin, and 34 area stores located across the country, as outlined in Figure 33. Materials availability is a key enabling factor for effective storm restoration in an electrical utility.

After the review of materials usage following Storm Darwin in 2014, a discrete stock of materials was set aside for use in exceptional storm situations only. This material has been kept under review after every significant storm event since 2014. Normal stocking levels are more than adequate for typical two to three day storms and therefore, the use of materials ringfenced for exceptional events has not been required frequently. It has only been required on three occasions: Storm Ophelia (2017), Storm Darragh (Dec 2024) and Storm Éowyn (Jan 2025).
It should be noted that Storm Darragh and Storm Éowyn were back-to-back storms either side of Christmas and demonstrated ESB Networks material supply chain resilience.

Figure 33: ESB Networks Supply Chain / Material stores locations



The team that was assembled to manage material demands and co-ordinate deliveries ensured that the worst-impacted areas had an appropriate share of materials, diverting materials from less-impacted locations. Normal deliveries were ceased in the days preceding the storm so that emergency storm deliveries could be prioritised to the worst-affected areas.

Towards the end of the response period, when resourcing was directed into worst affected areas such as Galway, Sligo and Carrick-on-Shannon, materials orders were dispatched to those areas proactively, to ensure no delay was caused due to availability of material.

Emergency orders were placed as necessary with manufacturers for critical material required. In some cases, materials were airfreighted from Germany, Portugal and Spain at short notice. Orders continued to be placed during the storm as forecasts required. In a very small number of cases, where supplies were running low, substitute materials or alternative work methods were identified and communicated to response teams.

Overall, there were no significant unfilled materials demands during the storm, which reflects good materials management both before and during Storm Éowyn. This achievement should be placed in the context of the volume of materials used during this storm when compared with previous storms. The volumes of key materials used were at least twice the level of those used during the next largest storms experienced since Storm Darwin, as outlined in Table 9 below. It is due to this consideration, and indications that weather events are becoming more frequent and more damaging, that ESB Networks has already decided to further increase stock levels that are set aside for major storms, with several storm material levels set to double to ensure further resilience is built into storm preparation.

Table 10: Sample usage of key materials across Storm Éowyn, Darragh and Ophelia

Material Type	Storm Éowyn Jan 2025	Storm Darragh Dec 2024	Storm Ophelia 2018
	Approximate figures		
Poles	4,500	1,013	2,000
Conductor	650km	290km	350km
Transformers	1041	250	250

Summary Findings

- The centralised resource coordination, while complex, worked extremely well.
- There was efficient use of all resources, with available experience, skills, capability and technology deployed effectively.
- ESB Networks strength of relationships with both contractors and European utilities was demonstrated through their quick turnaround and willingness to support the restoration efforts.
- ESB Networks successfully demonstrated its ability to effectively integrate a wide range of mixed field crews into its operations in a very short space of time, acknowledging that for some of the European crews, it was the first time many had travelled to Ireland to support restoration during a storm.
- The logistics of planning accommodation and food arrangements for the supporting field crews was complex due to the level of movement during the restoration period, and the high demand for hotel rooms in Ireland, but completed effectively.
- The dedicated planning and preparation of storm materials proved crucial to ESB Networks' ability to supply field crews with sufficient materials for repair works across all asset classes. The availability, supply and distribution of material was excellent, acknowledging Storm Darragh consumed significant volumes of materials two months before Storm Éowyn, in the second biggest storm ESB Networks had experienced
- ESB Networks assessment of sections of the network for the deployment of available ESB Networks mobile generation proved beneficial in harder-hit areas of the country.
- The use of smart meter event and fault logs was a positive initiative for updating of customer outage numbers and the subsequent prioritisation of resources but requires further development to ensure full alignment with normal operational processes and procedures.
- The restoration efforts resulted in almost 90% of customers who lost power being restored within 1 week of the storm. 95% of customers who lost power were restored within 10 days of the storm.

Recommendations

- **Resource Mobilisation #1**:
  Further strengthen relationships with international utilities, both through the review of existing structures in place with North, East, West, South Area Consortium (NEWSAC, a forum promising mutual aid in emergency situations among member electricity utilities in Ireland and the UK), and establishment of new agreements with the wider European utilities through engagement via E.DSO (European Distribution System Operator - the membership organisation for Distribution System Operators in Europe). Enhance storm readiness by increasing storm-specific material stock levels beyond pre-Storm Éowyn baselines and exploring harmonisation of materials with wider European utilities.
- **Resource Mobilisation #2**:
  Review and update the Regional & Local Storm Plans / Documents to ensure learnings are incorporated into future versions, with a focus on:
  - Reviewing the composition of crews during storm restoration to determine, and document, the best structure for optimum effectiveness for future storms
  - Defining the steps for the demobilisation of crews, including the transition to post-storm network repair and safety patrolling
  - The data capture process during both the damage assessment stage (foot patrol, heli patrols, drones etc) and network repair stage to maximise value of data during and after storm
- **Resource Mobilisation #3**:
  Enhance ESB Networks' capability to use Smart Meter data in fault scenarios, both non-storm and storm, to maximise the use of available data for customer outage management, including any relevant changes to the data access code.

5 Customer and Communications

5 Customer and Communications

Once again, ESB Networks acknowledges the devastating impact that Storm Éowyn had on communities across Ireland during January and February 2025. The widespread power outages caused by the storm brought significant disruption and hardship to thousands of homes and businesses, across the country. The following section of this report reviews ESB Networks communications with customers and external stakeholders during and after this destructive storm.

5.1 Customer Call Centre – Performance and Customer Contact issues

ESB Networks' National Customer Contact Centre is based in Wilton, Co. Cork, and outside of storm situations, the contact centre has over 70 call centre staff or advisors who manage all calls from customers to ESB Networks on a daily basis, with an additional 70 staff from the wider Customer Experience teams available to support the regular staff if required. ESB Networks utilises an outsourced service provider (Abtran) for overflow emergency calls during high volume emergency situations, with approximately 30 staff available to supplement the internal Contact Centre resources. In addition, backup contact centre, or hotsite, can be mobilised in an ESB Networks location at Finglas, Dublin. This provides a dedicated space for operations and volunteer coordination. The Customer Contact Centre has a well-established Storm Response procedure for emergency events, which utilises all available contact centre resources, as required. As described in the following sections, during Storm Éowyn almost 400 staff and volunteers worked in the main and back up Contact Centres, communicating with and supporting customers who had lost power due to the storm.

For Storm Éowyn, the storm response procedure was activated on Wednesday 22nd January. Weather reports were closely monitored to predict the trajectory of the storm and identify potential worst affected customer areas. Staff from the Customer Experience teams were informed in advance, and additional coverage, through the volunteer staff list, was arranged to handle the anticipated increased volume of customer interactions. Advance checks of backup systems for remote work were completed to ensure that all systems were functioning correctly. Comprehensive access and troubleshooting instructions were provided to all staff.

Following the onboarding of additional volunteers in the main contact centre, it was also decided by ESB Networks to stand up the back-up contact centre in Finglas for outbound calls only. The role of the backup contact centre was changed to also take inbound calls for Saturday 8th and Sunday 9th February. The backup contact centre was in operation from 29th January to 9th February.

5.1.1 Mobilisation of resources in Main and Backup Customer Contact Centres

There were a number of steps involved in mobilising the necessary resources for Storm Éowyn.

- **Increased requirement in resources (Outsourced Company and ESB Volunteers)** - The outsourced company (Abtran) was informed to prepare and make available their resources (30) for storm response and an additional 130 ESB volunteers were trained in call-taking by the Quality and Training team in the ESB Networks Contact Centre.

  The volunteers were sourced from a variety of functions and all management levels across the wider ESB organisation, from graduates to senior managers, and they supplemented the regular contact centre staff from the Customer Experience teams in covering shifts between 8am to 8pm onsite in the main building at Wilton, Cork. A further group of 87 volunteers drawn from ESB Networks and the wider ESB Group was established to staff the backup contact centre in Dublin. This resulted in total call-taking resource pool of over 400 people during Storm Eoywn. In comparison, during Storm Darragh, ESB Networks had a total of 135 staff members across all customer contact centre teams, including the outsourced provider, Abtran.
- **Remote and On-Site Work in Main and Backup Contact Centres** - Customer Contact Centres staff were enabled to work both on-site and remotely to ensure continuous call handling. Desks were provided on-site at the Backup Contact Centre, and staff were also enabled to work remotely.
- **Activating the Backup contact centre / hot site** - Preparation of operational systems along with the update and development of training, information and briefing material for the volunteers was completed. The completion of these steps provided all volunteers with adequate resources to perform the critical functions of the contact centre once the instruction to stand up the hot site was made.
- **Operational Adjustments** – The general enquiries line was closed in advance of the storm to prioritise emergency calls. This ensured that critical issues were reported and addressed promptly, and resources were allocated efficiently.
- **Customer Escalations** - A dedicated and experienced team was formed to handle customer escalations (situations which are difficult or where customers demand to speak to someone more senior), with the purpose of prioritising calls from vulnerable customers on a case-by-case basis and utilising the interfaces with the newly established NECG Humanitarian subgroup. In this way, information could be shared with the vulnerable customers on the range of supports that were set up by the various local authorities.
- **Proactive Dedicated Team for Outbound Calling to Vulnerable Customers** – A dedicated team in the Backup Contact Centre - working in both Finglas and remotely - was formed to make calls to both Vulnerable Customers and also single customers at the end of remote LV network, to confirm that their power had been restored, whilst continuing to share information on supports available within their local community. This was to lessen the chances of someone 'falling between the cracks' if the systems were indicating that supply was restored but that was not the case.
- **Contact Centre Management Support** - Working hours were extended for Team Leaders in the Wilton complex to provide adequate assistance and support for all staff, regular and volunteers, particularly with handling challenging calls relating to emergency and vulnerable customers throughout the storm restoration period.

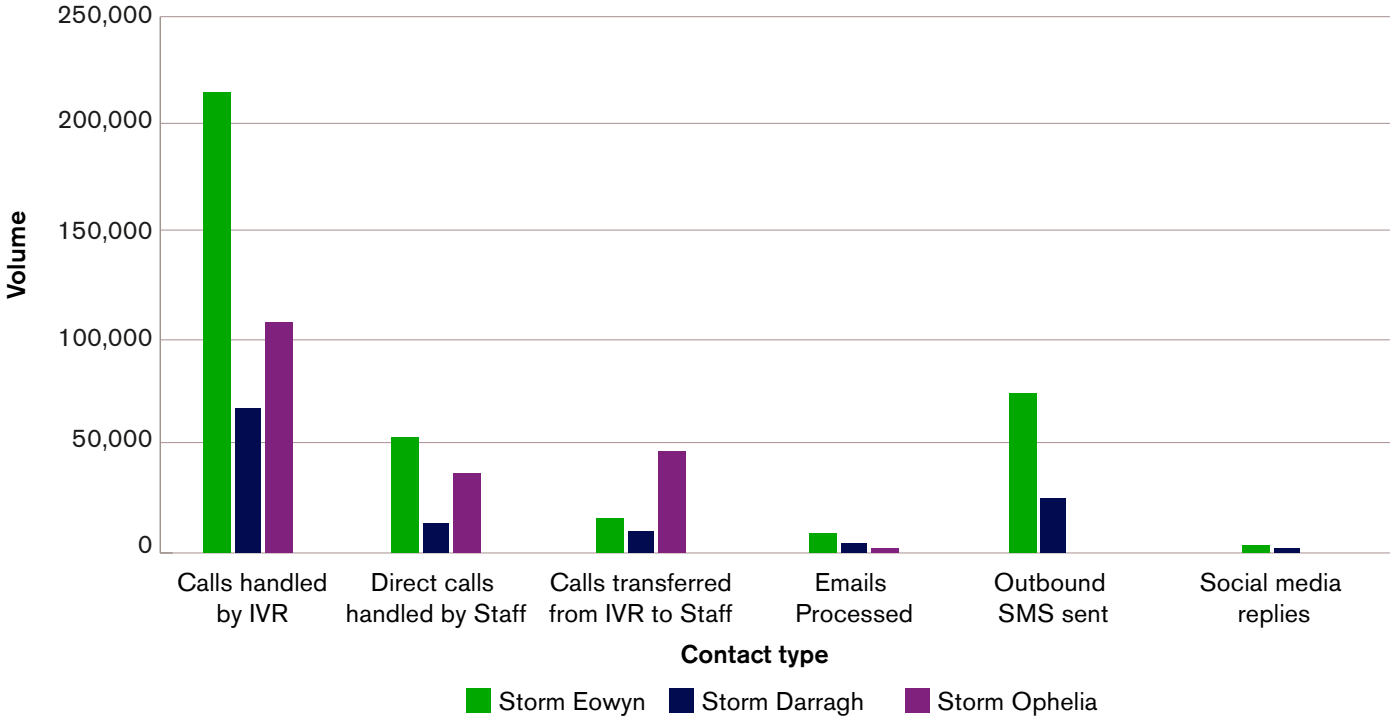
The measures taken were essential for the management of the unprecedented volume of customer calls during Storm Éowyn.

5.1.2 Performance of the Customer Contact Centres

The number of calls received during Storm Éowyn was triple that of previous storms, including Storm Darragh. The scale of the storm and the resulting call volumes were unpredictable, necessitating a flexible and robust response. The allocation of roles and resources, including the coordination of volunteers and team leaders, was critical in managing exceptionally high call volumes during Storm Éowyn.

By following the Storm response procedure, the contact centre performed well under extreme circumstances. Figure 34 outlines key metrics recorded for the National Customer Contact Centre during Storm Éowyn between January 24th and February 9th, showing comparisons with the next largest storms.

Figure 34: Comparison of Key Contact Centre Performance Metrics across Éowyn, Darragh and Ophelia



An IVR system is an Interactive Voice Response (IVR) telephone system that allows callers to interact with a computer system using their voice or by pressing numbers on their phone's keypad. IVR systems use pre-recorded voice menus to guide callers, enabling them to access information, complete tasks, and route their calls to the correct department or agent without needing a live person to answer the phone.

The Customer Contact Centre call queues during Storm Éowyn, measured from the day of the storm arriving to the end of the storm restoration period, were analysed. On January 24th in the immediate aftermath of the storm, the average call waiting times experienced by customers for calls handled by the customer contact staff was 11 mins. However, on January 26th, following additional onboarding of volunteers, the average waiting time dropped to one and a half minutes. By February 9th , the average waiting time had dropped to less than 15 seconds.

Given the volume of customers who were without power, in conjunction with the number of emergency fault situations on the electrical network, the overall performance of the contact centre improved over the course of the storm restoration period.

Overall, the collaborative efforts between various departments ensured good communication and efficient resource allocation. Safety, along with the well-being of customers and staff, was prioritised, while also ensuring that faults were logged, and all relevant details were captured to help locate and prioritise work.

5.1.3 Estimated Restoration Times

During Storm Éowyn, customers expressed frustration in relation to the Estimated Restoration Times (ERTs) issued by ESB Networks. In a number of cases, customers received multiple ERTs, which added to the challenges experienced by the customers from the loss of their power supply.

5.1.3.1 ERT determination during storm conditions

Estimated Restoration Time (ERT) is used to provide customers with guidance about when their power will be restored. Under normal network conditions, ERTs can be predicted with reasonable accuracy as soon as a crew gets to a fault location, based on their knowledge of how long it will take to repair the fault, and there is typically just that one fault preventing supply to the affected customers. However, in days immediately following a storm, local staff are often not in a position to update all ERTs, primarily because they have not yet assessed the scale of all the damage. They are also, unsure of the resources required, and available, for repairs and need time to patrol the thousands of kilometers of network to determine how many faults are impacting a specific customer, and how complex those faults will be to repair.

5.1.3.2 Communicating ERTs to the customer

ERTs are typically communicated through multiple channels to the customer; namely, via the Interactive Voice Response system (IVR), PowerCheck Website (with optional SMS updates), as well as through the agents in the National Customer Contact Centre. During Storm Éowyn over 900,000 customer updates were issued via PowerCheck's SMS service alone.

For 24 hours on January 24th, updating ERTs was suspended due to the volume of faults and potential for inaccuracy, given the emerging scale of the damage which would take time to assess. The decision to suspend ERTs was a key takeaway from previous storms and was a positive initiative in Storm Éowyn.

5.1.3.3 ERT accuracy

In a typical storm scenario, ERTs have proven useful and relatively accurate in most instances although it can be challenging to maintain this accuracy due to the dynamic nature of the storm repair effort. The impact that Storm Éoywn had on the network made ERTs less beneficial in this regard, owing to the quantity and nature of faults. Initial estimates proved too optimistic and ERT's for the areas with most damage had to be extended, and some on a number of occasions. ERTs were adjusted based on assessment of the damage to a given section of network and the likelihood of returning some or all of this section to full service. In many instances once a section of network was returned to service, it faulted once more due to additional damage to the network further down the line. This set of circumstances resulted in many customers at the end of sections of overhead network experiencing several different ERTs before their power was restored. Given the cascading nature of restoring sections of network, ERTs were updated section-by-section as the network was repaired.

Understandably this proved frustrating to customers, and on a review of the ERTs issued during Storm Éowyn, of the ~23,000 events that were logged on the NMS system, customers associated with over 8,000 of the events received only one ERT, with another 5800 faults associated with an initial ERT, plus one revision. However, the data shows that for approximately 500 faults, the ERT was revised five times for those affected customers as the scale of the damage and the necessary work to repair the network became clearer.

While acknowledging the complexity in calculating ERTs in severe storm situations such as Storm Éowyn, this is a key area ESB Networks should action to ensure improved communications with customers on estimation times for restoration of their power.

5.1.4 Vulnerable Customers

In Ireland, a Vulnerable Customer is defined as a domestic customer who is critically dependent on electrically powered equipment, which includes, but is not limited to, life-protecting devices, assistive technologies to support independent living, and medical equipment and who has formally registered as such with their electricity supplier. (European Communities (Internal Market in Electricity and Gas) (Consumer Protection) Regulations 2011 (S.I. 463 of 2011)).

Vulnerable Customers register their information with electricity suppliers. ESB Networks' Vulnerable Customer policy is available online, and Suppliers are required to inform customers of the limitations of this process during registration. Vulnerable Customer lists are received by ESB Networks from electricity suppliers and the data is added to the customer's details within the ESB Networks' system. There is a requirement for electricity suppliers to update and remove the data when customer circumstances change. Many customers who have medical conditions or are otherwise vulnerable do not register this information with their Suppliers. The information relating to Vulnerable Customers that ESB Networks has access to at any time may not be a full and complete representation of vulnerable customers.

In normal circumstances, registered Vulnerable Customers receive advance notice of planned outages. They will also receive text notifications if there is an overnight outage and during storm events. It is important to note that registering as a Vulnerable Customer does not provide prioritisation of power restoration during and after storm events. In any event, the scale of damage during Storm Éoywn was extreme, and the Vulnerable Customer population is very dispersed, so it would be impossible to prioritise one vulnerable customer over another. In this context, the ESB Networks' policy for Vulnerable Customers states as follows:

"ESB Networks is a participant in the Department of Defence Protocol for Utility companies and other agencies interacting with the public in an Emergency. This means that if ESB Networks personnel come across a person who is vulnerable during an emergency (for example when a crew calls to a house or the person rings our National Customer Contact Centre) they will first encourage the person to avail of local support from family or friends, but if this is not possible ESB Networks will pass on the necessary information to the appropriate authority (usually via the regional coordination centre, which is operated by the regional Principal Response Agencies, the Local Authority, the HSE and An Garda Síochána)."

Notwithstanding this, during Storm Éowyn every effort was made by ESB Networks to keep Vulnerable Customers informed both before and after the storm passed, through dedicated SMS text messaging and prioritisation of calls from the customers. As the scale of the impact to the network became evident, additional measures were taken to further support these customers.

On the day of the storm, when it became apparent that a large number of customers would be without supply for several nights, a decision was taken to text registered Vulnerable Customers to inform them of the situation and to advise them to make alternative arrangements if they were reliant on electricity. This was completed by the NCCC logistics team via a bulk text, using the mobile numbers available on the ESB Networks system. This method of communicating to vulnerable customers continued during the storm period. It should be noted that due to loss of mobile coverage across the country, not all of these text messages were delivered to the Vulnerable Customers, but was the only practical communication method available. To address this, ESB Networks opened an emergency secondary call centre, specifically focused on boosting contact with vulnerable customers in the Finglas depot, and .the volunteers there made 17k outbound calls to those customers. The purpose of the calls was to let the customers know of the best estimate of when their supply would be restored, based on information supplied by the local restoration teams, and to advise them of local supports that were available through the humanitarian aids provided by the Government.

Where contact could not be made, through the cross-agency approach, coordinated by the NECG Humanitarian Subgroup, ESB Networks were able to escalate specific cases to the correct channels including the HSE, An Garda Siochana, and emergency services. This proved to be an effective way to support the vulnerable customers, over and above ESB Networks' primary focus and duty of restoring power. More information on the engagement with the NECG subgroup is outlined in Section 5.1.6 below.

On January 24th, 97,478 customers in Ireland were registered as medical or vulnerable. On February 10th, 98,917 customers were registered as medical or vulnerable. A large volume of customers both registered and de-registered as medical or vulnerable during the storm, with 720 customers de-registering during the storm and 17 de-registering at the end of the storm. On April 2nd, 2025, there were 100,846 customers registered as medical or vulnerable.

In the PR6 submission to CRU made by ESB Networks in 2024, provisions are included for the development of further measures to support registered Vulnerable Customers, including during emergency situations.

Recommendations are being made by ESB Networks to the Government in relation to the development of enhanced structures and processes to further support the management of registered Vulnerable Customers across all agencies.

5.1.5 Large Critical Infrastructure owners

ESB Networks maintains a single point of contact for communication with critical-infrastructure customers during storms, with a dedicated email address to manage this engagement, providing regular updates throughout the restoration efforts.

This critical infrastructure included Acute Regional Hospitals, AirNav, Coastguard Radio, Tetra, water treatment plants, telecommunication sites, and local radio stations. Unlike other storms, during Storm Éowyn, the Department of Education was also a key customer, with schools becoming a high priority as the restoration efforts continued to enable all schools to re-open on February 4th, after the bank holiday weekend. Over 1,800 priority critical infrastructure calls were escalated by the Critical Infrastructure customers through these channels.

Table 11: Critical Infrastructure Sites Escalations Managed

Critical Customers	Number of Sites Escalated
HSE Acute Sites	102
AirNav	8
Coastguard	2
Tetra	270
Regional / Local Radio Sites	15
Uisce Eireann	417
Telecommunications Sites	690
Schools	302

Throughout Storm Éowyn, ESB Networks' Critical Infrastructure customers received updates daily, and in some cases up to three days times per day. Through this single point of contact, ESB Networks worked with these customers, each of whom, in turn, provided the order of priority of their sites. This allowed ESB Networks local Storm Managers to deploy the repair crews accordingly.

Similar to ESB Networks', approach to its own critical infrastructure sites, customers are expected to have risk-assessed their sites and made their own arrangements for backup power supplies. During Storm Éowyn, the deployment of generators by the critical infrastructure providers was key to quickly restoring these sites and their critical services. The multi-agency coordination that was provided across the country by the National Emergency Coordination Group (NECG) was essential in providing temporary emergency supplies for critical infrastructure where they were not able to deploy backup generation themselves. Further information on the NECG and the subgroups can be found in the following section.

5.1.6 Dependency on Communications for Restoration

ESB Networks' uses a number of combination of channels for communication during storm situations, including Tetra phones, public mobile networks and public fixed line communications.

Following Storm Darwin, a decision was made by ESB Networks to utilise the Tetra network for communication during emergency restoration situations, such as storms or major weather events. During Storm Éowyn, approximately 200 Tetra sites lost power, and the service was impacted areas a result. In addition, over 800 mobile telecommunication radio sites were also impacted due to loss of main and back-up power. This resulted in voice communications both amongst crews, and between crews and depots, being severely affected. In addition, fixed line communications services providing broadband to ESB Networks offices for access to central systems were affected in several areas. Feedback from the restoration teams indicates that this loss of voice and data communications during the storm significantly impacted the coordination of restoration works. Instead of having the ability to speak to the National Distribution Control Centre from the fault location, as is required to receive permission to switch so as to comply with the safe procedures for network switching and operations, or to other crews at different sites, the teams were required to drive to the nearest point with available coverage or communications, which resulted in extended time for repairs.

Furthermore, there are over 2.5 million active ESB Networks devices on the electricity network which use the public mobile telecoms network for connectivity to smart meters and network automation devices. The loss of service significantly impacted the functionality of these devices and further illustrates the reliance that ESB Networks has on mobile telecoms networks.

5.1.7 NECG and NECG subgroups

The National Emergency Co-ordination Group (NECG) is the central government forum in Ireland, established to coordinate responses to national-level emergencies, including severe weather events. It is activated by the Office of Emergency Planning upon request from the Department of Housing, Local Government and Heritage. The NECG involves all relevant government departments, local authorities, emergency services, and agencies.

ESB Networks is a member of this group, and as part of the ESB Networks Storm Plan, there is a dedicated role assigned with the responsibility of coordinating between the NECG and the ESB Networks NERG, as required.

The first meeting of the NECG was held on Wednesday, January 22nd and the NECG continued to meet each day up to and including Monday, February 10th, with press releases issuing daily, providing status updates and key information from each meeting. Regular status updates were provided to the NECG at each meeting by the ESB Networks representatives in attendance.

Due to the large-scale disruption to services caused by Storm Éowyn, the NECG established two additional sub-groups to manage the ongoing coordination of the whole-of-government response to the impact of the storm;

- NECG Sub-Group for Critical Infrastructure
- NECG Sub-Group for Humanitarian Assistance

ESB Networks provided representatives to participate in the coordination efforts managed by these subgroups.

On January 26th, as part of the NECG coordination efforts, Ireland activated the EU Civil Protection Mechanism, making a request for high-capacity generators to support critical infrastructure operators.

5.1.7.1 NECG Humanitarian Subgroup

The scale of the impact of Storm Éowyn on the electricity network, with cascading effects on essential services and infrastructure, presented significant challenges to individuals and communities, particularly in remote locations.

Working with the support of the other members of the NECG Sub-Group for Humanitarian Assistance, Local Authorities coordinated a local level response to the needs of people who had been significantly impacted by the storm. Local Coordination Groups were set up across 16 Local Authority Areas – Cavan, Cork County, Donegal, Galway County, Laois, Leitrim, Limerick City and County, Longford, Meath, Monaghan, Offaly, Roscommon, Sligo, Westmeath, Wexford and Wicklow. Emergency Response Hubs were also set up across the country providing people with water, hot food, phone charging, broadband access and shower facilities.

ESB Networks provided several representatives to support these local coordination groups. This involved attendance at meetings and the provision of status updates of supply restoration in the local area. In addition, ESB Networks made contact through SMS and follow up calls with customers in the Tuam, Galway, Sligo and Cavan area to provide information on the supports being made available. As outlined earlier, a dedicated team within the National Customer Contact Centre was formed to handle escalations related to vulnerable customers, with the purpose of prioritising calls from vulnerable customers on a case-by-case basis and utilising the interfaces that were newly established with the NECG Humanitarian subgroup, sharing information with the vulnerable customers on the range of supports that were set up by the Local Authorities. In addition, ESB Networks established a dedicated team in the backup centre working both onsite in Finglas and remotely, to proactively make calls to vulnerable customers.

To support the NECG subgroup to assist vulnerable customers, ESB Networks referred information relating to vulnerable customers whose power had not been restored to the HSE or An Garda Siochana on a county-by-county basis each day, where personal data was sensitively managed, in line with GDPR policies. This was the first time the management of such data was required, and it is in this area, in particular, where policies need to be further developed to formalise how such data can be processed for the greater good and in the best interests of vulnerable individuals in times of emergency, similar to that of Storm Éowyn.

5.1.7.2 NECG Critical Infrastructure Subgroup

During Storm Éowyn, the NECG Critical Infrastructure Subgroup focused on the coordinated restoration of infrastructure services. ESB Networks played a pivotal role in ensuring the dissemination of critical customer information into the Storm Restoration teams, and in parallel provided essential updates to the critical infrastructure owners.

The team communicated estimated restoration time (ERT) updates and managed the escalation of priority sites within the ESB Networks regions for critical infrastructure customers, including Uisce Eireann (Irish Water), Tetra, AirNav, HSE, Telco companies, Radio Stations, and the Department of Education. By prioritising communication with these groups, ESB Networks helped mitigate the impact of the storm on essential services, ensuring that emergency responses were timely and effective, that services other than electricity were also prioritised and that public safety was upheld throughout the event.

During Storm Éowyn, a team was established in ESB Networks to manage the engagement with the Critical Infrastructure Owners using a dedicated Storm Response email account - over 1,800 critical calls were escalated through this subgroup. A critical customer group who had not been previously represented at this level was the Department of Education, who became a new critical customer in this storm, with a target of having all schools open on Tuesday February 4th, after the February bank holiday.

5.2 Customer and External Communications

During Storm Éowyn, ESB Networks sought to use all available channels for communication with customers and succeeded in delivering clear and timely communication throughout all phases of the storm event. In addition to the large volume of direct customer engagement in the main and backup Customer Contact Centres, content was shared more broadly through all available channels, including real-time updates, safety information, and public awareness materials.

Safety and restoration updates were provided continuously on social media and radio (nationwide and regionally in both English and Irish) to reach the widest possible audience. Powercheck and LinkedIn platforms were also used to provide real time updates. TV safety videos and Argiland digital content was circulated, as well as the publication of press advertisements, video advertisements and newspaper articles to keep the public informed. Customers received text messages with each update regarding faults and restoration efforts, if they had registered for that service on the Powercheck App. ESB Networks' website was also updated with relevant data and public safety messages to ensure comprehensive coverage. ESB Networks and the ESB Press Office also responded continuously to media queries, with journalists and reporters travelling to visit crew worksites and interview ESB Networks staff throughout the country, which also proved beneficial in keeping the public informed on the restorations efforts as outlined in Section 5.2.2 below.

This multi-channel communications approach was used to help keep customers informed, safe, and supported as they waited for their electricity supplies to be restored. Table 12 below provides an overview of the number and type of communications made during Storm Éowyn. Both Powercheck and the ESB Networks website experienced a short outage on the day of the storm due to the rapid increase in customer traffic visiting both platforms but returned to service quickly.

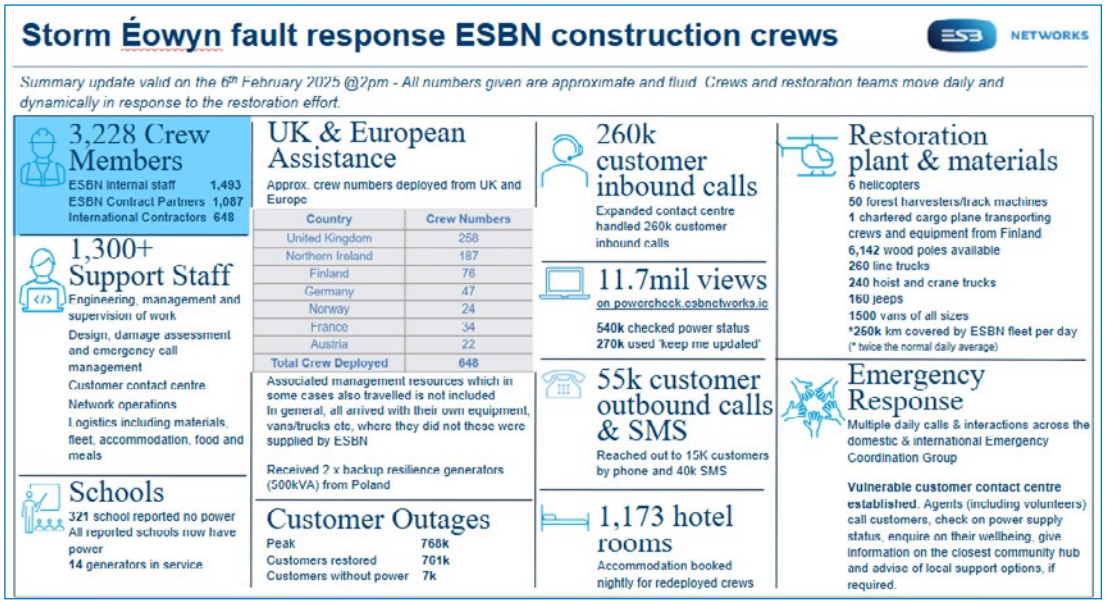
Table 12: Overview of communications made by ESB Networks during Storm Éowyn

Content Themes	Channel Volumes	Additional Communication Channels
Storm Preparation and Safety Content: Reaching to 256,000+ customers	Facebook: 1.4 million+ reach	Powercheck: 2,173,930 visitors
Safety regarding fallen Wires: Reaching to 294,000+ customers	Twitter: 355,000+ impressions	National & Local Radio Stations: over 300 interviews
Generator Safety: Reaching to 442,000+ customers	Instagram: 173,000+ reach	Over 50 press releases and statements
Progress updates: Reaching to 938,000+ customers	LinkedIn: 68,000+ impressions	Over 1000 engagements with media

5.2.1 Communication to Government Departments

In addition to communicating to the public via regular press releases and media updates, ESB Networks provided updates to Government Departments through meetings and via a daily information summary, which was shared by email from January 28th to February 6th. This daily status report provided an opportunity to share a regular and consistent set of updates, as per the sample in Figure 35 from February 6th. The objective of this circular was to ensure that everyone was kept informed with the most timely and accurate information as was available each day, and feedback received by ESB Networks confirmed that the summary communications were welcomed and appreciated by the recipients.

Figure 35: Sample daily communications to Government Departments (from Feb 6th 2025)



Storm Éowyn fault response ESBN construction crews

ESB NETWORKS

Summary update valid on the 6th February 2025 @2pm - All numbers given are approximate and fluid. Crews and restoration teams move daily and dynamically in response to the restoration effort.

3,228 Crew Members
ESBN internal staff 1,493
ESBN Contract Partners 1,087
International Contractors 648

1,300+ Support Staff
Engineering, management and supervision of work
Design, damage assessment and emergency call management
Customer contact centre
Network operations
Logistics including materials, fleet, accommodation, food and meals

Schools
321 school reported no power
All reported schools now have power
14 generators in service

UK & European Assistance
Approx. crew numbers deployed from UK and Europe

Country	Crew Numbers
United Kingdom	258
Northern Ireland	187
Finland	76
Germany	47
Norway	24
France	34
Austria	22
Total Crew Deployed	648

Associated management resources which in some cases also travelled is not included
In general, all arrived with their own equipment, vans/trucks etc, where they did not these were supplied by ESBN

Received 2 x backup resilience generators (500kVA) from Poland

Customer Outages
Peak 768k
Customers restored 761k
Customers without power 7k

260k customer inbound calls
Expanded contact centre handled 260k customer inbound calls

11.7mil views
on powercheck.esbnetworks.ie
540k checked power status
270k used 'keep me updated'

55k customer outbound calls & SMS
Reached out to 15K customers by phone and 40k SMS

1,173 hotel rooms
Accommodation booked nightly for redeployed crews

Restoration plant & materials
6 helicopters
50 forest harvesters/track machines
1 chartered cargo plane transporting crews and equipment from Finland
6,142 wood poles available
260 line trucks
240 hoist and crane trucks
160 jeeps
1500 vans of all sizes
*250k km covered by ESBN fleet per day
(* twice the normal daily average)

Emergency Response
Multiple daily calls & interactions across the domestic & international Emergency Coordination Group

Vulnerable customer contact centre established. Agents (including volunteers) call customers, check on power supply status, enquire on their wellbeing, give information on the closest community hub and advise of local support options, if required.

5.2.2 Press releases & Media Appearances

During Storm Éowyn, ESB Networks took full advantage of public communication channels to maximise communication with customers. From January 23rd until February 12th, ESB Networks issued over 50 press releases and statements, held over 300 national and local interviews, responded to over 250 media queries, and recorded over 1,000 engagements with the media. In particular, use of local radio proved to be extremely effective, particular in areas where loss of power affected customers receiving TV and social media communications.

These regular updates through all available channels during Storm Éowyn maximised the chances that critical information was accessible to all customers. The press releases were also circulated internally within the Customer Contact Centre to keep staff and volunteers updated daily, so that they could ensure that their information for customers was up to date and accurate.

Dedicating time for this important stakeholder engagement activity is crucial and the information provided must be as up to date as possible. Each day the team provided updates to media from as early at 06:30am each morning, right through the day until 22:30, aiming to have timely and accurate information each news cycle.

ESB Networks considers external communication with customers and stakeholders to be critically important in circumstances such as storms or large weather events. The duration of effort required by ESB Networks during Storm Éowyn was the largest ever experienced for a storm event. To ensure communication during future storms and weather events, which may be over prolonged periods, can be sustained, consideration should be given to expanding of the pool of resources available for media engagement and a review completed to identify how to maximise the effectiveness of media interaction.

5.2.3 Feedback on Communications and Engagement during Storm Éowyn

Although ESB Networks was successful in spreading awareness of the scale of the damage to the network across all available channels, customer sentiment declined after January 27th. Analysis was carried out on 300k interactions and on 7.1k social media posts which mentioned ESB/ESB Networks from January 23rd to February 10th. During the initial days of the storm and restoration (23rd to 27th January), positive and negative posts from social media were on par (23% and 24% respectively). As the impact of the storm endured (January 27th to February 10th) sentiment became more negative (28%) and less positive (20%). However, over 50% of the feedback remained neutral throughout the storm.

While feedback received showed that ESB Networks' crews were widely appreciated for their continuous efforts to carry out repairs, long power cuts, shifting restoration times, and lack of clear restoration timelines dominated the conversation, leading, understandably, to increasing levels of customer frustration.

A key learning from Storm Éowyn is for ESB Networks to determine the best way to collect and share the extent of the storm damage, in conjunction with improvements to the communication and accuracy or reliance of Estimated Restoration Times. Improvements might include additional insights into the work involved in restoration, and to help explain why some restorations can take a long time, which would also support the communications around the available estimated restoration times.

5.2.4 Wider Communications across ESB and other key stakeholders

Throughout Storm Éowyn, in addition to the various forms of internal and external communications, regular update briefings were also delivered to the ESB Networks DAC Board, the ESB Board, ESB's Executive Director Committee, Northern Ireland Electricity and EirGrid, to provide updates on the restoration efforts.

Summary Findings

- ESB Networks developed an effective communications plan for engagement with internal and external stakeholders during the storm.
- Approximately 400 staff worked in the National and Back-up Contact Centres, including additional volunteers and outsourced company employees, resulting in an increase of 159 % of staff involved in this activity compared to next biggest storm, Storm Darragh (135).
- The Back-Up Customer Contact Centre (hot site) was activated effectively, staffed by approximately 87 volunteer staff available, who mostly made outbound calls.
- The Contact Centre telephony systems proved to be very robust and also demonstrated its capability for to support agents working remotely for an extended period of time.
- Customers expressed frustration with Estimated Restoration Times which were revised a number of times.
- There was significant usage of all available media channels, resulting in high reach and awareness with members of the public. While becoming extremely stretched towards the end of the storm, ESB and ESB Networks' media representatives were widely appreciated for their frequent and continued engagement with external stakeholders throughout.
- Power Check was hugely effective in the communication effort with customers, with almost 12 million views during the storm. Both Power Check and the ESB Networks website experienced a short outage on the day of the storm due to the rapid increase in customer traffic visiting both platforms.
- ESB Networks demonstrated innovative practices through a new protocol of engaging with Vulnerable Customers via direct outbound calling from the Backup Contact Centre, utilising both onsite and remote volunteer agents.
- ESB Networks existing relationships with the NECG worked very well, proving crucial for the overall coordination of restoration at a national level, sourcing support from other agencies, ensuring humanitarian assistance was secured for customers and communicating key messages. ESB Networks' also provided attendance at the two new NECG subgroups formed during the storm.
- A high volume of Tetra and public mobile telecommunications base stations lost power during the storm which highlighted an interdependence between the resilience of the telecommunications systems and the ability of the ESB Networks crews to deliver the repair service to restore power supplies. Feedback received from storm restoration teams indicated that the lack of emergency and public communication services significantly impacted the coordination of restoration works.

Recommendations

- **Customer and Comms #1**:
  ESB Networks to further enhance support for Vulnerable Customers by progressing the planned measures set out in the PR6 submission, and to make a recommendation to the NECG to explore how the information on Vulnerable Customers can be consistently managed across all utilities and services, acknowledging the existing data-sharing requirements between suppliers and ESB Networks.
- **Customer and Comms #2**:
  Explore how improvements can be made to outage communication during storm events by enhancing the use of available data for the calculation, management, and transparency of Estimated Restoration Times (ERT). This should be supported by the development of a pre-winter Communications Plan to provide information to customers on ESB Networks' Estimated Restoration Times process during storms. Continue to enhance the functionality of ESB Networks' Power Check application to further improve the communication to customers during storms.
- **Customer and Comms #3**:
  Recommend that the NECG consider formalising coordination structures by building on the Humanitarian and Critical Infrastructure Subgroups established during Storm Éowyn, including an assessment of the interdependencies of the critical infrastructures.
- **Customer and Comms #4**:
  Working with Critical Infrastructure owners, ESB Networks should continue the installation of Smart Meters in all Critical National Infrastructure sites to further enable the assessment of power supply during storm situations. ESB Networks should support the Critical Infrastructure owners with risk assessing their back-up generation requirements at key sites.
- **Customer and Comms #5**:
  ESB Networks should regularly review and update its newly extended volunteer list of staff for roles within the Customer Contact Centre during storms, with the regular refresher training to be provided.
- **Customer and Comms #6**:
  ESB Networks should review the coordination and availability of media updates during periods of storm restoration, and ensure adequate resources are available in the Press Office for protracted weather events. ESB Networks should explore how to improve visualisation of data for external communications during storm events.

6 Safety Issues

6 Safety Issues

Safety was a significant concern during the restoration efforts following Storm Éowyn. The safety of the general public, staff, contractors, and visiting crews from other utilities was paramount. Given the extent of the damaged network, there were significant numbers of downed conductors at all voltage levels 38kV and below, some of which were live. As has been described in earlier sections of this report, the earliest stage of the restoration efforts focused on making the environment safe and responding to 'extreme danger' calls. ESB Networks mobilised specific damage assessment crews and concentrated the public messaging and advertising on the dangers of fallen wires that may appear safe, but may be still live. ESB Networks regards it as a significant achievement that there were no serious or significant safety incidents during the restoration efforts.

6.1 Safety Management and Performance (ESBN and external / contractor)

The safety, health and wellbeing of ESB Networks' staff and contractors, as well as the communities and customers served by the electricity network, continues to be a core strategic priority and area of focus. ESB Networks' Safety Strategy sets out the strategic intent and commitment on how the network safety is maintained. It outlines how awareness can be raised about the importance of safety, health and wellbeing among staff and contractors, as well as the dangers for the general public of coming into contact with, or being in close proximity to, electricity networks and equipment. During Storm Éowyn, the implementation of ESB Networks' accredited safety management systems ensured that safety compliance, engagement, communications, and public safety were all effectively managed.

6.1.1 Communicating with Staff via Safety Briefings

The communication of safety messages with staff and contractors is a key part of ESB Networks' safety management system and the sharing of information on risks that may be encountered in the field, as well as emerging hazards, is hugely important in storm scenarios.

On the afternoon of January 23rd, a text alert was issued to all staff advising them to stay home and stay safe on January 24th as Storm Éowyn crossed the country and the national Red Alert was active. Subsequent safety-related text messages were issued to all staff on January 24th and January 30th.

The daily storm safety briefing process in ESB Networks at each depot prior to the start of work each day is mandatory and is the main channel for communicating safety messages to staff and contractors. In total, 18 daily safety briefings were prepared and delivered over the duration of Storm Éowyn. These briefings contained information on the weather conditions, the progress of the storm effort in terms of customer and outage numbers, and the hazards that may be encountered. Each daily brief was tailored based on the safety challenges that were most likely to present themselves on a given day in a particular area, and covered key hazards such as:

- Electricity
- Working at heights
- Driving
- Vulnerable & less experienced workers (e.g. Apprentices)
- Fallen trees & timber
- Fatigue
- Slips, trip & Falls
- Engaging with Members of the Public

These daily storm briefings are well received by staff and contractors, and they were highlighted by international visiting crews as an excellent safety management tool.

Figure 36: Sample daily Safety Briefings for ESB Networks staff, contractors and visiting utilities

6.1.2 Inducting Visiting International Crews & Retired Staff

Induction briefings were given to all visiting international crews when they arrived in Ireland at various locations across the country. The briefings were delivered by trainers from the ESB Networks National Training Centre (NTC). Similar induction briefings were also delivered to retired staff.

The international crews were always accompanied on site by an experienced ESB Networks staff member, who ensured onwards communication of the daily safety briefings to these crews and advised on all aspects of safety and welfare.

6.1.3 Safety Incident Reporting and Safety Assurance

Safety is a shared responsibility and by reporting incidents and good catches, the worker is protecting themselves and their colleagues. In ESB Networks, staff and contarctors are encouraged to report incidents, with the objective of learning from the incident to prevent harm in the future, to help identify patterns and to look to mitigate risks before they become major problems.

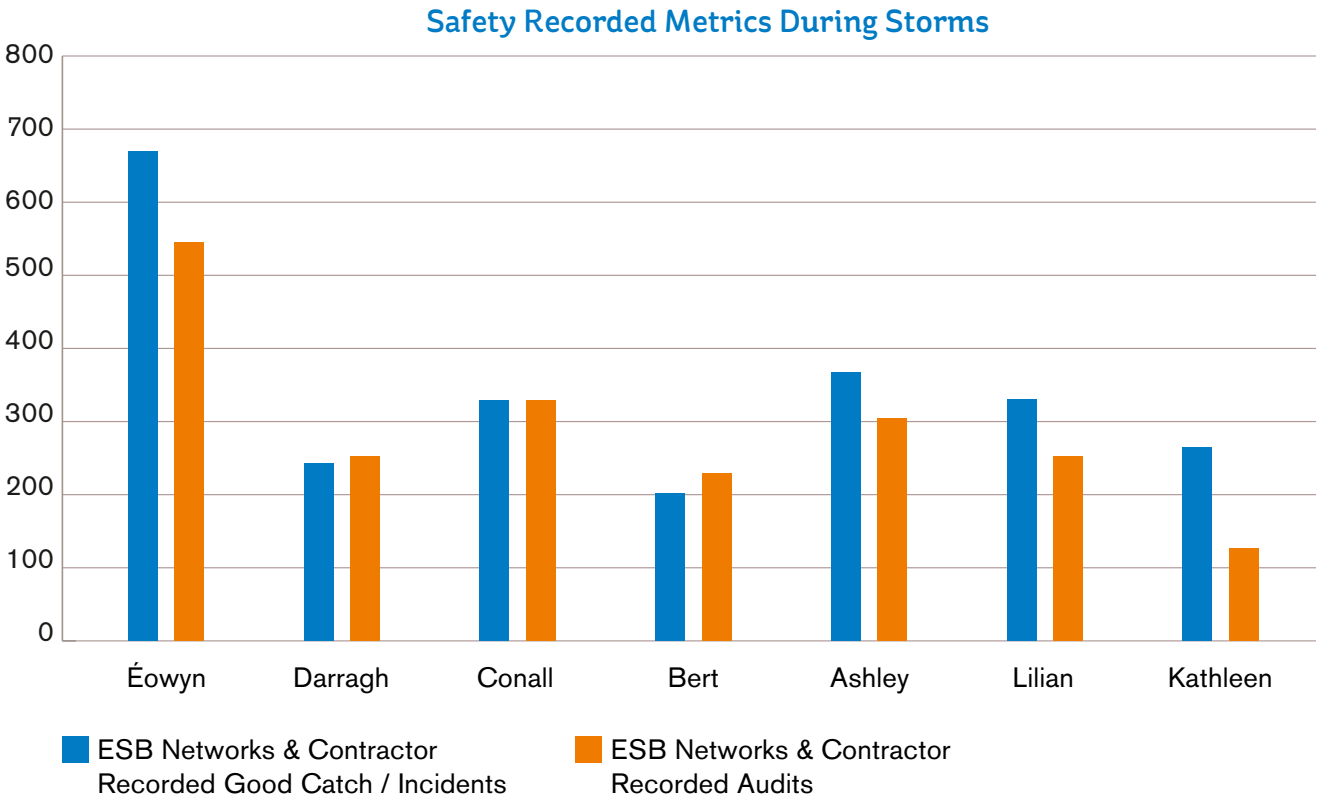
In ESB Networks, any injury causing absence from normal duties for at least one full day is defined as a Lost Time Injury. Other safety incident types include Good Catches, Near Misses, Operational incidents, Dangerous occurrences, and Minor injuries.

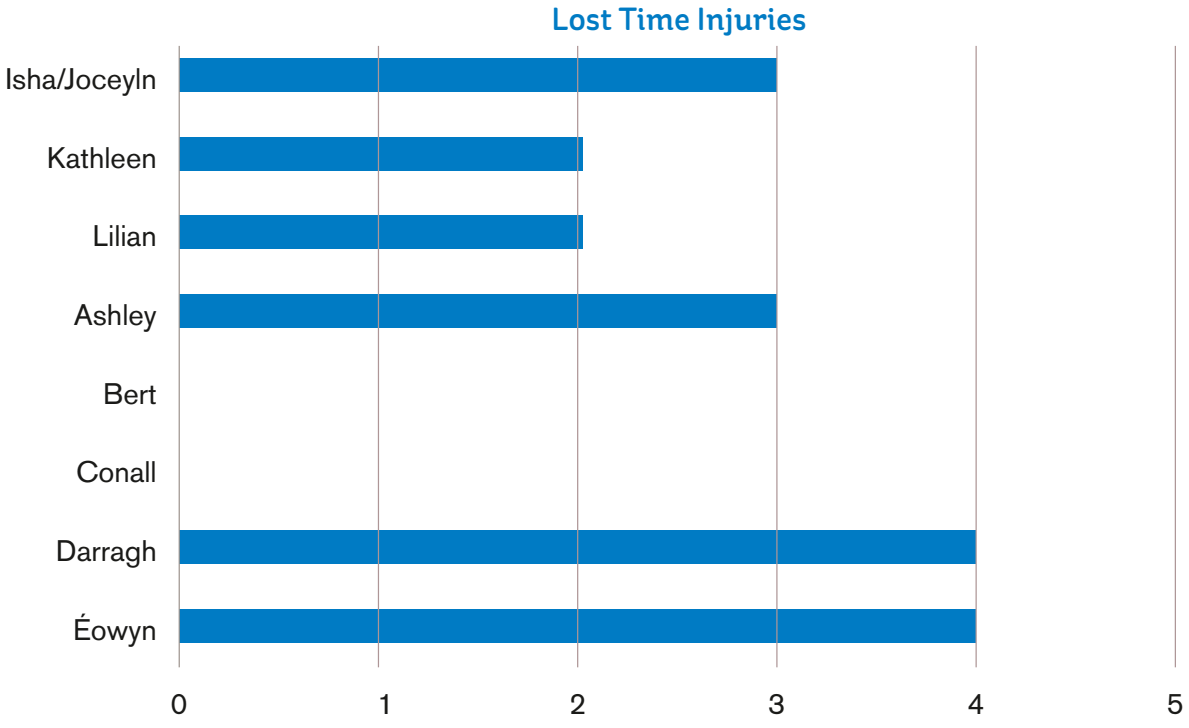
Safety auditing is a key element of ESB Networks' safety management system and provides assurance to management and staff that work activites are being carried out safely and in line with approved procedures. Safety assurance is achieved through monitoring, coaching and auditing / inspecting safe behaviours and compliance with policies and procedures in all work locations. Safety auditing is carried out by the delivery teams on their staff locally. Independent auditing is carried out by the Competence and Assurance team from the Safety Health & Wellbeing function. In addition, the regular safety processes, procedures and systems for the logging and recording of incidents, continue to be utilised in all situations including emergency and storm response by ESB Networks staff and contractors.

During restoration, safety performance, as measured by Lost Time Injuries, good catch reports, and incident reporting, was consistent with other recent storms and showed improvement since Storm Darwin, while contractors recorded more safety audits than ESB Networks staff. In many areas, Safety Supervisors and Competence & Assurance Auditors were reassigned to roles like Restoration Coordinator or Operator due to their skills and approvals. This created gaps in safety assurance, leaving busy local teams to handle audits. For future storms, dedicated safety assurance support should be strengthened to better assist management and staff.

The graphs below summaries the Incident and Audit data recorded during Storm Éowyn, other storms in 2024 and comparable storm events in the recent past. Four minor Lost Time Injuries were recorded, which, when considered against the background of the extensive damage, and the large volume of hazards and timber that had to be overcome across challenging and unfamiliar locations, ESB Networks deems this safety performance to be very good.

Figure 37: Comparison of Key Safety Metrics between Storm Éowyn and past weather events





6.2 ESB Networks Safety Rules

6.2.1 Purpose

In compliance with applicable law, ESB Networks has adopted safety protocols, standards and polices (amongst other things) so as to ensure, so far as is reasonably practicable, the safety, health and welfare at work of all ESB employees and to provide safe systems of work that are planned, organised, performed, maintained and revised as appropriate. These measures have been adopted so as to ensure the safety and protection of all who manage, control, operate, supervise or carry out activities on, or adjacent to, the ESB Networks systems. Compliance with these measures is mandatory and include the development of safe methods of work during non-storm periods.

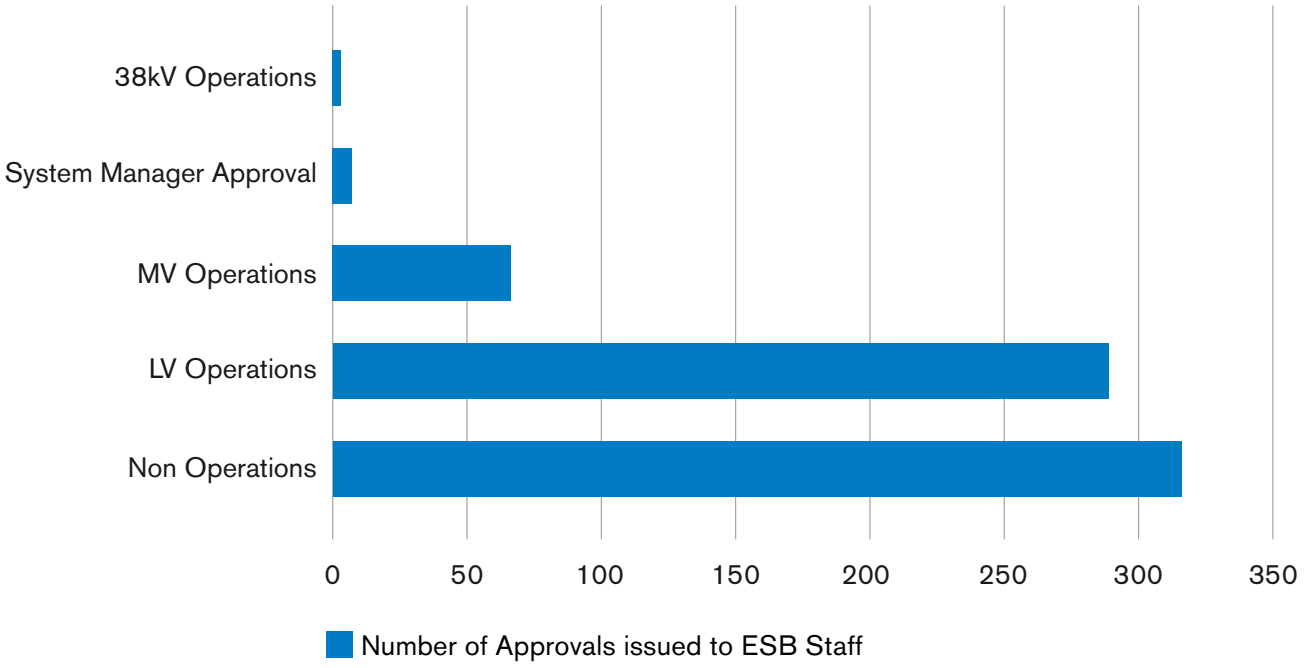
6.2.2 Training and Approvals

A key safety control when working on the electrical network is the process for issuing safety approvals to staff for specific tasks. The policy and procedures associated with approval process detail the governance, controls and requirements to ensure::

- Safety Critical Roles or Tasks are assigned or issued to competent persons i.e. persons with the necessary knowledge, training and experience
- Roles and responsibilities are clearly established

During the Storm Éowyn restoration effort, the National Training Centre (NTC) coordinated the issuing of approvals to staff, retired staff and framework contractors across the company to facilitate the increased resources required for the safe restoration of the network. Only staff who met the minimum competence, following assessment by the NTC, were assigned a safety approval. A total of 784 approvals were issued to 240 ESB Networks staff. The assignment of these approvals permitted personnel with the relevant knowledge, training and experience to carry out work on the ESB Networks' system across the LV, MV and HV Systems.

Figure 38: Number of Safety Approvals issued to ESB Staff during Storm Éowyn



6.2.3 Procedures developed and used during Storm Éowyn

To maximise the safe use of visiting international crews, ESB Networks developed and implemented for the first time a new procedure to allow UK and NIE crews to carry out work on certain defined sections of network using their own safety rules and safe systems of work. A temporary amendment to ESB Networks' Electrical Safety Rules was made to facilitate this change, as described earlier in section 3.1.2, demonstrating ESB Networks agility to adapt during emergency situations. This adaption was developed in a controlled manner with focus was maintained on the safety procedures and safe systems of work throughout. A desktop-based development and risk assessment was carried out, followed by a controlled site pilot and subsequent rollout, with feedback taken and incorporated into the final agreed procedure..

6.3 Safety and Welfare of Staff and Contractors

6.3.1 Welfare Facilities, Food and Accommodation

Many ESB Networks staff were impacted by the storm and were also without power or water at home for many days. Many staff therefore had to avail of welfare facilities in local offices / depots during the storm to access showers and mobile drying facilities. The provision of mobile drying facilities was developed during previous storms and is now a facility used when required. Cleaning rotas in depots were increased to ensure hygiene standards were maintained given the heightened level of activity and, in many ESB Networks locations / depots, mobile welfare units were hired to accommodate staff and contractors. Access to hot meals was provided to all personnel and was arranged by the ESB Networks' business support teams. As described earlier is section 4.1.5, the arrangement of meals and accommodation and other welfare supports to such a large number of resources who were mobile across the country was a significant undertaking. The business support team who managed this critical part of the storm response supported the resources for the entire duration of the storm response ensuring their welfare was kept at the centre of the restoration works.

Figure 39: Example of Safety Briefings content focusing on welfare of storm restoration teams

6.3.2 Working time and rest breaks

During the restoration effort personnel involved are typically working long hours for extended periods. Fatigue in any workplace can result in slower reactions, reduced ability to process information, absent-mindedness, decreased awareness, lack of attention, underestimation of risk and reduced coordination. As a result, fatigue can lead to serious incidents and injury in the workplace, particularly considering the safety-critical work being completed by the crews, involving difficult terrain, live electricity network and working at heights. Combating the risk of fatigue was actively managed during this storm event. The topic was addressed in the daily safety briefings to highlight the risk to staff and an instruction was issued from Senior Management directing staff to ensure that rest periods were taken throughout the duration of the storm event, and also after the storm event, as staff transitioned back to normal business as usual duties. This is particularly important given the long days work, and the protracted nature of the Storm Eowyn restoration period.

Additionally extra rest periods were mandated and managed locally through the local storm managers and supervisors to ensure all staff received adequate rest time. Rest breaks were not only encouraged and taken by the ESB Networks staff, but framework contractors, helicopter pilots and international utilities had rest periods during their time providing support. While the vast majority of staff did take the recommended rest breaks during the restoration works, this area should be considered for close monitoring during future storms for all staff, field and non-field, to ensure rest breaks are taken as recommended as the over-riding sentiment in the crews is the wish to work on to connect as many people as quickly as possible.

6.3.3 Security of staff and property / tools etc

Unfortunately, during Storm Éowyn, ESB Networks had to contract third-party security firms following incidents where vehicles were broken into, and equipment was stolen. This was mainly at hotels where vehicles were parked overnight and at staff accommodation. This should be considered as a requirement for future storms, where large groups of staff and contractors are working and staying, with the utility vehicles being very visible to opportunist criminals.

Summary Findings

- Excellent safety performance with zero serious safety incidents across staff, contractors and members of the public. Four Lost Time Injuries recorded, but nonserious in nature.
- Safety Induction for all crews and daily mandatory safety briefings - hugely positive feedback from visiting crews
- Robustness of safety processes and procedures e.g. Risk Assessing new ways of working during Storm Éowyn, with a new safety procedure developed, including required Risk Assessment and control
- Flexibility of training and approval system – building on huge experience and capability across the organisation with the ability to safely issue approvals to additional staff as required, and the decision to allow NIEN and UK crews to work under their own safety rules increased the volume of resource available.
- Welfare of staff and contractors was central to all restoration efforts, with rest periods encouraged both during and after the storm.

Recommendations

- **Safety Issues #1:**
  Formalise Safety Assurance roles within emergency storm plans to include dedicated auditors for real-time observation and post-storm safety auditing, aligned with day-to-day safety practices. Standardise safety protocols for visiting utilities through NEWSAC and E.DSO collaboration, including the development of Storm Safety Toolboxes to support consistent safety practices. Ensure employee wellbeing by applying oversight to the scheduling rest days during and after storm events, to safeguard recovery and performance.

7 Conclusion

7 Conclusion

Storm Éowyn was the most severe weather event to impact Ireland's electricity network, triggering over 10,000 faults and affecting 768,000 customers at the peak - almost double the impact of previous major storms. Customers were hugely impacted, with extensive power outages causing significant disruption and hardship to thousands of homes and businesses around the country, particularly in the most severely affected regions.

ESB Networks responded with a large-scale mobilisation of over 4,000 personnel, supported by contractors, international crews, harvesters, helicopters, and heavy equipment, restoring 95% of customers within 10 days, including office-based support staff who handled calls, created work packs, engaged with stakeholders, managed logistics, handled media queries, monitored social media and provided training.

The restoration efforts were aided by robust telecoms, automation systems, and a well-prepared supply chain that met unprecedented material demands without significant shortages. Coordinated efforts across vulnerable customer support, critical infrastructure, and extensive communications ensured public safety and the restoration of power.

The response to Storm Éowyn provides valuable insights and learnings to further strengthen ESB Networks' storm preparedness and restoration capabilities, and engagement with stakeholders for coordination before, during, and after a storm event.

8 Glossary

Term	Definition
ECDAC	Emergency Call and Damage Assessment Co-Ordinator
ERT	Estimated Restoration Time
HSE	Health Service Executive
NCCC	National Customer Contact Centre
NEWSAC	North East South West Area Consortium
NECG	National Emergency Coordination Group
NERG	National Emergency Response Group
NMS	Network Management System
NT	Network Technician
SCADA	Supervisory Control and Data Acquisition

Appendix 1

Restoration timeline

Pre storm prep

As Storm Éowyn Approaches

Engagement with the National Emergency Coordination Group is initiated. ESB Networks activates its emergency response plan, through the National Emergency Restoration Group, Regional & Local storm teams, and the National Customer Contact Centre.

Before The Storm Hit

Before the first gust of wind, the NECG is activated. Safety messages are issued, materials deployed across the country, and contractors with international crews placed on standby to ensure support is ready as soon as required.

ESB Networks Co-Ordination And Response

Alert The Public

ESB Networks issued early warnings through national, local media, and social media. ESB Networks engaged with the NECG to align messaging with emergency services.

Storm hits

Storm Impact

The storm sweeps across the country, damaging power lines, uprooting trees and cutting electricity to hundreds of thousands of homes and businesses. At the peak, approximately 768k customers lose power. ESB Networks & EirGrid's control centres see high activity on Network Management Systems where fault events are recorded.

ESB Networks Co-Ordination And Response

Safety First

Engagement with NECG continues through briefings and press statements reinforcing safety advice. Registered vulnerable customers are contacted by ESB Networks via text about expected power supply impact. Storm Restoration Crews wait ready until it is safe to address immediate safety hazards and assess damage.

Restoration timeline

Phase 1: after 72 hrs

Large-Scale Restoration Begins

Once the red weather alert is withdrawn and it is safe to do so, ESB Networks crews begin to repair the faults on the higher voltage network, while also attending to Extreme Danger calls. In total, over 4900 Extreme Danger calls are reported by the public.

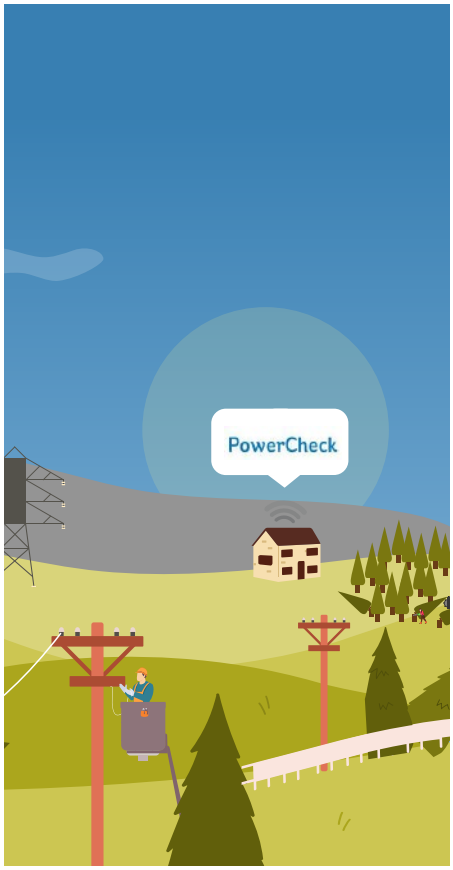
On The Ground

Foot, drone and helicopter patrollers commence the assessment of the damage across the country - completing over 12,500 assessments by the end of the storm. Field crews supported by civil services, are involved in restoration works. Within 72 hours over 533,000 customers have their power restored.

ESB Networks Co-Ordination And Response

Enabling The Restoration Works

Work pack producers develop and issue construction packs to field crews for fault repair. The logistics team arrange accommodation and support for field crews who are deployed across the country.



Phase 2: after 7 days

More Complex Faults Emerge

Customers restoration continues, but some customers face subsequent power interruptions during repair works network switching Working with NECG's Critical Infrastructure Group, ESB Networks engage directly with critical infrastructure owners to manage escalations for priority site restoration.

Multidisciplined Field Crews

Over 3000 field resources, from across ESB Networks staff, European utilities and contractors work across rough and waterlogged terrain, keep the restoration of power to customers moving. These multidisciplined resources with expertise in overhead lines, poling, and timber cutting are supported by 50 forestry harvesters.

ESB Networks Co-Ordination And Response

Customer Engagement

Backup contact centre are stood up which handle all customer calls. Media updates and PowerCheck keep the public informed with Estimated Restoration Times. Vulnerable customers are contacted directly. ESB Networks engages with the NECG humanitarian group and county councils to further support affected people across the country.

Restoration timeline

Phase 3: after 14 days

Challenging Terrain

More dispersed, hard-to-reach areas remained without power. Public concern grew, and support centres became more active.

Restoration In Action

Critical storm materials continue to be distributed to crews in remaining affected areas continues.

ESB Networks Co-Ordination And Response

Tracking Of Faults & Customer Calls

Outstanding faults continue to be tracked and prioritised with updates shared via targeted media, social channels and regional outlets. Almost 400 contact centre agents take and make calls with customers, which includes over 200 volunteers from across the company, and 30 staff from the outsourced service provider (Abtran).

Phase 4: by February 11th

Final Restorations

By February 11th, the final 1–2% of customers were reconnected, some after more than two weeks. Vulnerable customers were supported, and isolated "single node" and seasonal supplies were restored. Final messaging confirmed full restoration.

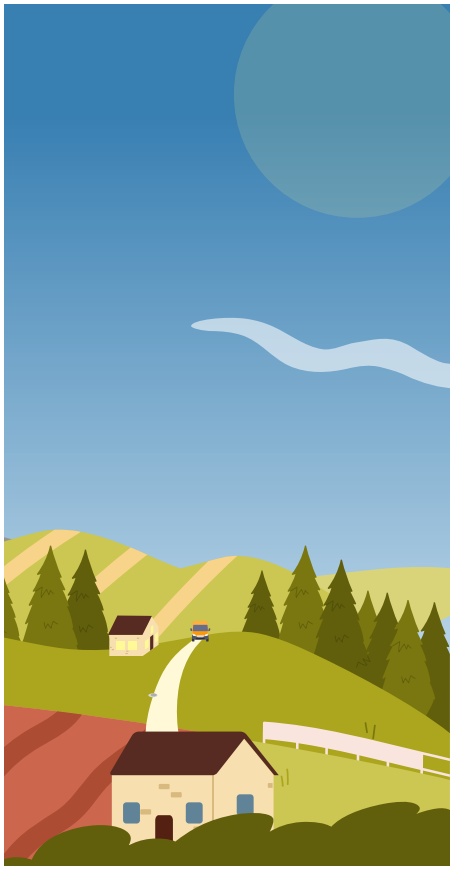
Continued Recovery

Crews completed final LV repairs, permanent replacements of temporary fixes, and storm clean-up. Remaining faults often required repeat work in difficult locations, with materials, equipment, and resources in use until the last day.

ESB Networks Co-Ordination And Response

Last Mile

The power to final properties is restored. ESB Networks' National Emergency Restoration Group and Storm Restoration Teams demobilise from restoration, with visiting utilities returning home.



Appendix 2

Support Provided to ESB Networks During Storm Éowyn

ESB Networks would like to acknowledge and thank the various contracting partners and companies, utilities, state agencies and local organisations who supported ESB Networks during the restoration period.

In addition to the large number of hotels, B&Bs, shops, restaurants, and petrol stations, the following is a list of the companies, utilities, and organisations who worked directly with ESB Networks with the restoration efforts during Storm Éowyn.

Contracting Partners and Organisations

Abbey Tree Services
Actavo
Alan Jordan
All Aspect Tree Care
Allwood Tree Care
Arkion
Bantry Tree Care
Bryan & Eoin Kenny Plant Hire Ltd
Carr Plant Hire Ltd
Circet
Cyberhawk
Direct Cleantech Civils Ltd
Conal's Tree Services Ltd
David Nodwell Ltd
Dermot Casey Tree Care Services
Desmond Langan Ltd
Dunmanway Tree Care Ltd
Eoin O'Neill Plant Hire Ltd
Electric Skyline
Euro Forest
Executive Helicopters
Fleming Plant Hire
Gaeltec
Ground Control
J & J Blackwell
J Courtney
J C Tree Surgery
Jimmy Munnelly
John J McSweeney Plant Hire Ltd
John O'Gorman Plant Hire Ltd
Kevin Lowry Plant Hire Ltd
Kilcawleys
Killeens
KTL
Lydons
Lynch Brothers North West Plant Hire Ltd
Martin Farrell Civil Contracting Ltd
Maurice Murphy Plant Hire Ltd
MFM Plant Hire Ltd
MIMA Sky
Murphys
New Roller Forks
Newton Plant Hire
Niaron
Nolans
Ormonde Tree Care

P&D Lydon Plant Hire Ltd

Parklawn Tree Services

Reach Active

Richard Nolan Civil Engineering Ltd

Sands Tree Services Ltd

S&S

Seamus Bergin

Sean Lunleavy -Longford timber

Sean Flaherty Ground Works

Skahanna Contracts Ltd

Smerdon Tree Services

SMK Forestry

S Wilkin & Sons Ltd

Thomas Swaine & Sons Ltd

TLI

TLJ and Treepro Ltd

Will O Gorman

Supporting Utilities and Agencies

Eltel (Finland)

Enedis (France)

E-ON (Germany)

Kraftmontasje/Powerline (Norway)

Linz Netz (Austria)

National Grid Electricity Distribution (UK)

Netz Niederösterreich (Austria)

Northern Ireland Electricity (Northern Ireland)

Northern Powergrid (UK)

Omexon (Finland, and their Scottish partner Norpower)

SP Electricity North West (UK)

SSE South & North (UK)

UK Power Networks (UK)

UVR NNB (Finland)

West Netz (Germany)

Organisations and Agencies who worked together with ESB Networks during the restoration efforts

Air Corps

An Garda Síochána

Coillte

Defence Forces and Civil Defence

HSE

Local Authorities and Fire Services

National Parks and Wildlife

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