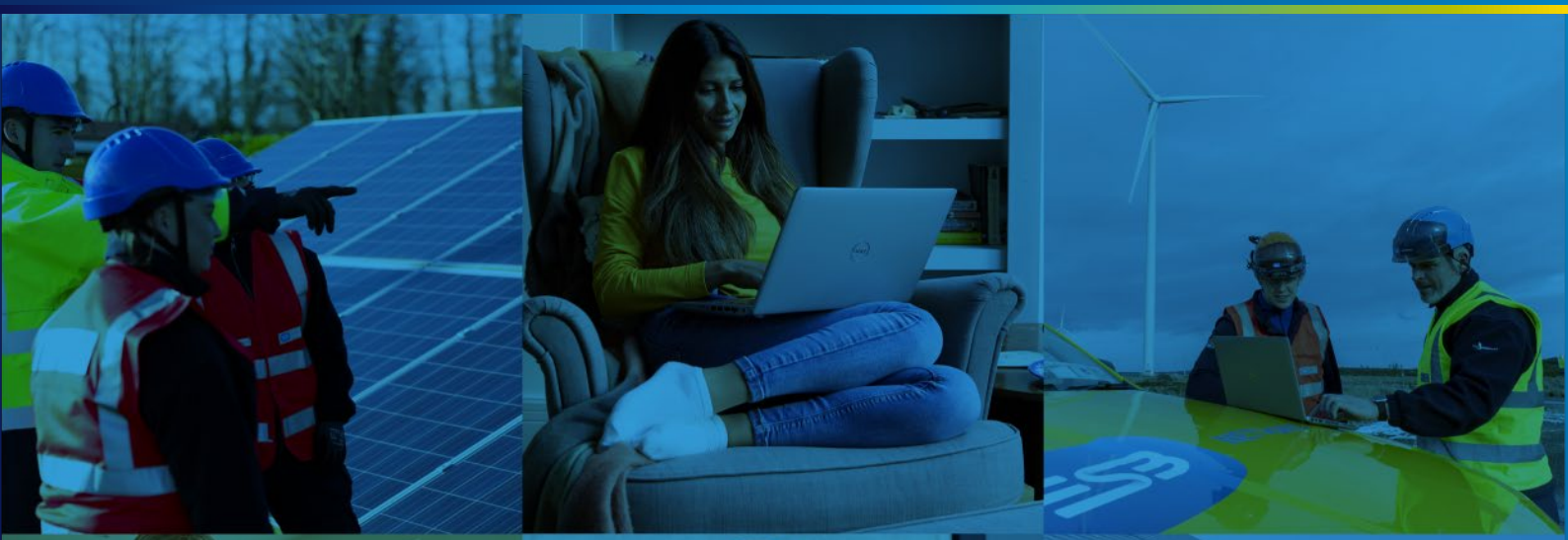
NETWORKS

ESB NETWORKS WINTER 2025 RESILIENCE PLAN

March 2025



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1.0 Executive Summary

Following a Government Decision in the aftermath of Storm Éowyn, ESB Networks was tasked with developing an Enhanced Winter 2025 Grid Resilience Plan. The plan, to be ready within one month, is to be implemented between March and October of this year. The objective of the plan is to enhance the resilience of the grid in the most vulnerable locations for the upcoming winter.

Increasing the resilience of the network in light of the scale and ferocity of Storm Eowyn is a multi-year programme and much of this has already been provisioned for in our PR6 Business Plan as submitted to our regulator in 2024. This Winter 2025 Grid Resilience Plan sets out to take some immediate short-term measures to reduce the impact of a potential storm in the winter of 2025 in the finite timeframe, while progressing plans and initiatives that will provide longer term benefits into the future.

The key components of this plan are:

1. Complete the surveying of 23,000 km of electricity network following the storm, making safe hazards and identifying remedial works needed to refurbish network weakened by the recent storms. Post storm patrolling of the transmission and 38kV network is already complete and plans are in place for the Distribution networks.
2. Refurbish overhead line equipment in the areas most damaged by the storm and cut hedgerow timber on these networks. The extent of this works will be defined following the survey and based on the scale of damage found. ESB Networks have made specific provision for this programme at a current estimated cost of €23m. The final cost of the programme will be submitted as an update into the Price Review 5 lookback assessment as part of the Price Review 6 process with CRU.
3. Outside of the worst affected areas, the planned national programme of overhead line and timber maintenance will continue in all other areas.
4. Analysis of customers most affected by forestry windfall in recent storms has identified 710km of network corridors which are being assessed. ESB Networks will continue to work with Coillte and Department of Agriculture Food and the Marine to identify the sections of this network at highest risk of further windfall. This is expected to be completed by end of April. While recognising the significant challenges facing the forestry industry in the aftermath of Storm Éowyn, there is a requirement that those corridors most at risk of further windfall are cleared before Winter 2025.
5. ESB Networks has set out options to establish the necessity of forestry corridors on a statutory basis. It also recommends the joint development of new corridor standards that recognises the need to adapt to climate change with a revised corridor standard that supports the co-existence of a resilient electrical network and afforestation.
6. Current materials stocking levels successfully supplied all internal, domestic and international crews throughout the entire restoration works of Storm Éowyn. Notwithstanding this, ESB Networks intends to replenish and expand the emergency storm stocks by doubling it in size and aims to have this in place by October 2025.
7. Several innovation projects planned for 2025 and 2026 have been identified for acceleration before Winter 2025.
8. Reflecting the hugely positive and timely utility support from across Europe to Storm Éowyn restoration efforts and the growing need for mutual utility support, ESB Networks is engaging with its European colleagues to put in place mutual storm support Memorandums of Understanding's before October 2025.
9. ESB Networks has commenced the process of a formal Storm Review. This review may identify recommendations to be implemented in advance of future storms.

ESB Networks is committed to enhancing the resilience of the electricity supply to homes, farms and business in advance of next winter by delivering the plan set out in this document. Storm Éowyn brought extensive damage to the network and ESB Networks is determined to bring as much of the network as possible back to the designed standard within the timeframe in the areas worst affected.

2.0 Introduction

On the 24thJanuary 2025, significant damage was caused to the electricity network due to the impact of Storm Éowyn. The entire country, including the electricity network, was impacted by a whole of Ireland Red Warning weather event. This unprecedented event saw the country impacted by hurricane force gusts of 184 km/h and mean speed winds of 142 km/h, both of which broke national records. At its peak, 768,000 customers were affected, and almost 11,000 faults were logged on the system, indicating the unprecedented scale of damage to the electricity network. As a comparator the damage caused by Storm Éowyn was over twice that caused by either storm Darwin (2014) or Ophelia (2017) in relation to customer numbers impacted. Over 3200 crew members were involved in the restoration works, which in addition to our ESB Networks crews included over 1000 contractors and almost 650 crew members from European utilities. The crews were supported by 6 helicopters and 50 forest harvesters. The restoration works included the replacement of over 3000 poles. Our main and back up customer contact centre handled over 250,000 inbound customer calls, made over 15,000 outbound calls to customers, along with sending approximately 40,000 SMS / text messages. 95% of our customers were restored within 10 days of the storm.

On 5th February, a decision was made by the Government to request that ESB Networks develop an ”Enhanced Winter 2025 Grid Resilience Plan” to be implemented over the months of March to October, to enhance the resilience of the grid in the most vulnerable locations for the upcoming winter.

Under the terms of the Distribution System Operator Licence issued by the Commission for Regulation of Utilities, ESB Networks DAC is required to ‘*operate and ensure the maintenance of and develop, as necessary, a safe, secure, reliable, economical and efficient electricity Distribution System…’*. Network resilience is the ability of assets, networks, and systems to anticipate, absorb, adapt to and/or rapidly recover from a disruptive event. We are committing to adapting our network to ensure it is more resilient to the impacts of climate change and reduce its physical vulnerability to the increased severity of disruptive climate events.

3.0 Planned Programmes of Work outside of Storm Affected Areas

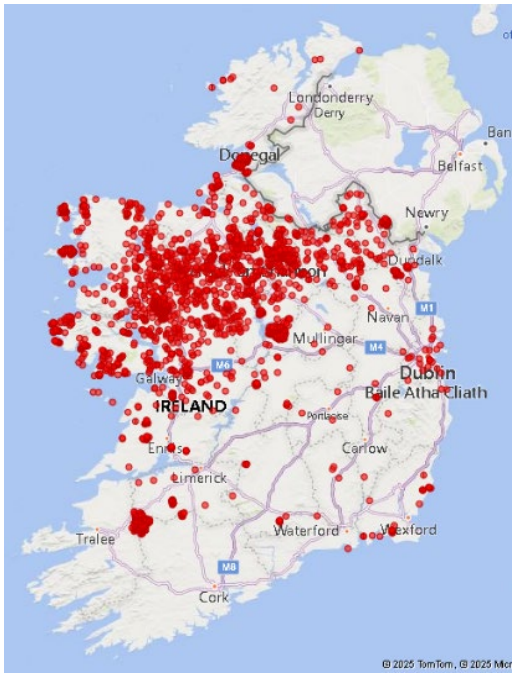
ESB Networks will continue to deliver planned national overhead line and timber maintenance programmes, outside of the areas identified as worst affected by the storms.

4.0 Making the Network Safe & Identifying Network Weakened by the Storm

4.1 Identifying Worst Affected Areas

The worst affected areas have been prioritised considering a number of factors, including the number of customers impacted, the time to restore supply, and the number of faults and level of damage caused during the storm. Both during and since the storm, a large amount of network repair, reinforcement and vegetation clearance has already been completed across the country.

From the affected areas illustrated in the map below, the sections of the network that remain most vulnerable after Storm Éowyn have been prioritised for attention over the months between March and October.



4.2 Post Storm Network Inspection

As a result of the extensive damage caused by Storm Éowyn, a patrol of the worst affected network is necessary to identify public safety hazards and faults on the network for immediate remedial action. Helicopter, drone and foot patrols will be used for this with some of this having already taken place. Both the transmission network and the 38kV network has had a full post storm helicopter patrol completed. In addition, sections of the MV network have also been patrolled with drones, with the wider programme of prioritised MV backbone lines already commenced.

In addition to the network inspection and patrol completed already, the following categories of network inspection have been prioritised.

Network	Action	Geographical Area	KM
National	The full transmission network has been patrolled as part of this plan	National	7000km

Transmission Network			
National 38kV Network	A full patrol of the 38kV network post storm will be completed by the end of October.	National	*5600km*
MV backbone lines – worst affected areas	Complete a drone patrol on a prioritised list of MV backbone lines before the end of May. Complete selected MV backbone line inspections thereafter in the worst affected areas, based on findings from initial patrol.	Targeted regions	*~3500 km*
Other MV network – worst affected areas	Complete an MV patrol on the remaining MV network in the worst affected areas, based on findings from initial patrol.	Targeted regions	*~7000km*

4.3 Targeted Post Storm Overhead Line Network Repair & Refurbishment

As the network patrols and inspections are completed, fixing of public safety hazards, such as an electrical conductor at low height in a public area, and the repair of network will take place as follows:

Network	Action	Geographical Area	KM
National Transmission Network	Repair of defects, replacement of damaged components and the removal of identified timber breaching clearance standard. Works requiring outages will be subject to scheduling of such outages.	National	7000km
National 38kV Network	Repair of defects, replacement of damaged components and the removal of identified timber breaching clearance standard. Works requiring outages will be subject to scheduling of such outages.	National	*5600km*
MV backbone lines – worst affected areas	Programme of repair works will be sized and scheduled based on the returned patrol surveys. Works on backbone line in the most affected areas will be prioritised. Programme of works to October 2025 to be optimised for maximum customer benefit.	Targeted regions	*Extent of works to be completed by October dependant on survey outcome*
Other MV network – worst affected areas	Programme of repair works will be sized and scheduled based on the returned patrol surveys. Works on backbone line in the most affected areas will be prioritised. Programme of works to October 2025 to be optimised for maximum customer benefit.	Targeted regions	*Extent of works to be completed by October dependant on survey outcome*

It is expected that the largest volume of work will take place on the Medium Voltage back-bone lines in the areas most affected by recent storms. The scope of this work will include –

- Damaged or weakened poles to be replaced.
- Defect clearance and design interventions such as inter-poling on long spans of network.
- Reconductoring where conductor is found to be damaged.
- Clearance of hedgerow timber and vegetation that is impacting the network.

4.4 Innovation Projects and Pilots

Several innovation projects planned for 2025 and 2026 have been identified for acceleration before Winter 2025.

They include:

- A pilot to assess both the viability and benefits of trussing of wood poles, focusing initially on priority forestry corridors.
- Assess both the viability and benefits of increasing pole height carrying network that runs through lengths of forestry corridors.
- In recognition of the significant impact of climate change on infrastructure resilience, ESB Networks initiated a project in 2024 to comprehensively review historical (past 40 years) and projected (next 20 years) environmental conditions affecting its electrical network. The project, which will continue in 2025, incorporates a sensitivity analysis, linked to varying global warming scenarios, focusing on key environmental parameters such as temperature, wind, precipitation, and humidity. The resulting insights will inform and support evidence-based decision-making regarding engineering specifications and strategic investments in climate adaptation and mitigation initiatives.

5.0 Forestry Corridors

5.1 Critical Corridors for Winter 2025

A key component of the Ministers decision for a 2025 Grid Resilience Plan is the requirement to safeguard electrical network passing through commercial forests. To ensure a storm-resilient electrical supply to homes, farms and businesses there is a requirement for the clearance of corridors through higher risk forested areas before this winter.

Existing mapping information and aerial surveying have been used to map and quantify the length of electrical network passing through commercial forestry. While the national average percentage is low, it is not evenly spread nationally and is concentrated in specific geographical areas, for example some 103 electrical medium voltage outlets (6,231km) have more than 10% of its network running through forestry.

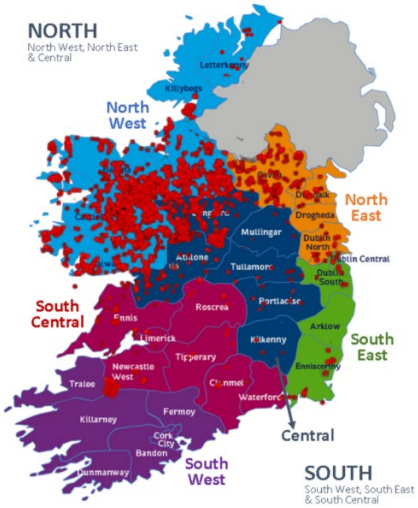
Forestry ownership is spread across Public (Coillte) and Private (Landowners, farmers, pension & private equity funds etc). Approximately 25% of electrical corridors cross Coillte forestry and 75% cross private forestry.

Voltage	Network 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%

Following extensive storm related damage to the electricity networks, particularly from Storm Éowyn and other recent storms (Ashley, Bert, Conall, Darragh, etc.), ESB Networks has undertaken several immediate actions to understand the complexity and impact of wind damage to the electricity network across the Republic of Ireland. Initial investigations have identified that the Medium Voltage (10 and 20kV) network is particularly susceptible to further damage from windblown forestry impacting both the conductors and supporting infrastructure.

The extent of customer faults and network damage resulting from falling timber in our recent storms has also been overlaid to identify the network most vulnerable to falling trees. In total, of the 3,112km of medium voltage network running through forestry, 710km are most at risk for this winter (see table below and associated note). While this risk is most acute on the medium voltage network some residual risk also remains on the 38kV network.

Planner Group	Length of MV in Coillte Forestry (km)	Length of MV in Private Forestry (km)
Athlone	17.0	34.0
Ballina	23.1	48.1
Castlebar	11.5	24.4
Cavan	12.7	31.0
Ennis	23.8	91.6
Galway	7.2	10.4
Killybegs	30.0	36.1
Letterkenny	5.4	7.3
Longford	11.9	45.2
Mullingar	4.7	17.4
Sligo	53.8	134.8
Tuam	6.8	21.7
Total	208	502



Note: A Planner Group is an electrical network area. There are 34 Planner Groups and their geographical areas are shown in the above map.

Through engagement with Coillte and the Department of Agriculture Food and the Marine, further aerial surveying is taking place to quantify the extent of forestry damage following the storm. ESB Networks is also in the process of more detailed drone and foot surveys of the identified most vulnerable corridors. These are expected to be completed by the end of April. At this point a more granular heat map of forest corridor windblow vulnerability is expected. Until this plan is finalised, costs related to forestry corridors for winter 2025 have not been determined or included.

Engagement will also continue with the Department of Agriculture Food and the Marine to assess the risk of electrical network passing through private forestry. Where easements are in place, ESB Networks will engage with easement holders in respect of network that is most at risk.

5.2 Mitigating Corridor Risk for Winter 2025 and Beyond

In the immediate aftermath of the storm ESB Networks engaged with the key stakeholders (Department Environment, Climate and Communications, Department of Agriculture, Food and the Marine) regarding potential actions for consideration to protect the electricity network into the future. These include:

- Introduce legislation to put Forestry Corridors on a Statutory Footing. Consideration should be given as to whether legislation should be introduced that prohibits the planting of trees within voltage-specific distances of existing and new electricity lines. Such legislation should also set out the obligation to keep such corridors clear of trees and consider appropriate compensation.
- Determine and agree the extent of the forestry corridors that are required. Current ESB corridor standards reflect a safety clearance requirement from the overhead line, where as a corridor for full network resilience would be significantly wider. In the UK safety clearance corridors have been placed on a statutory footing while resilience corridors are guidelines only.

- Establish the industry framework as to who the appropriate party would be to cut any existing forestry trees within the agreed corridors and to maintain that corridor.
- Consider reviewing the afforestation licensing and grant funding conditions setting out corridor clearance and maintenance as a minimum compliance requirement.
- As an additional measure only broaden the powers of ESB Networks under section 98 of Electricity (Supply) Act 1927 to enable ESB to cut, lop or clear any tree/shrub/hedge that may obstruct or interfere with an existing electric line.
- Consider establishing a requirement that any party intending to plant trees/shrubs/hedges within a certain distance of an electric line would have to first notify ESB and so that the Minister and/or ESB would have the power to issue a prohibition order to prevent trees/shrubs/hedges that are deemed to be too close to an electric line.

5.3 Working with Coillte

A key component of the Ministers decision for a 2025 Grid Resilience Plan is the requirement to safeguard electrical network passing through commercial forests. As set out earlier, ESB Networks requires the clearance of corridors through higher risk forested areas before this winter to ensure a storm-resilient electrical supply to homes, farms and businesses.

The exceptional damage caused by Storm Éowyn has impacted the entire forestry sector. Approximately 10 million cubic meters (c. 40 million trees) of timber is now on the ground following the extreme storm winds, which now needs to be salvaged. It is understood that this represents some 3 years' worth of normal annual harvesting which will necessitate an almost doubling of harvesting capacity. In this context, Coillte has advised that a dedicated programme of corridor clearance for electrical circuits in advance of winter 25/26 would have significant impact to the forestry industry given the scale of their recovery work underway. Coillte has proposed to integrate corridor clearance work with its current task of recovering windblown trees from forestry areas damaged during the recent storm. This will make most efficient use of the harvesting machinery available for the recovery work while also addressing clearance corridors for the electricity network.

Following engagement between Coillte & ESB Networks, the following approach is considered to be best achievable in advance of the coming winter to mitigate the risk to electricity lines crossing through Coillte forestry -:

- High resolution mapping of all forestry will be completed by Coillte by the middle of April.
- In parallel, ESB Networks have commenced a comprehensive programme of drone surveys on electrical network crossing through forestry.
- A subsequent risk assessment will then take place by ESB Networks in conjunction with Coillte which will identify high risk areas of forestry which have been impacted by windblow and which pose the greatest risk to the electricity network through further windblow.
- Coillte expertise indicates that forestry areas which have withstood the hurricane force winds of Storm Éowyn and have no damage are at low risk to similar prevailing south-west winds in the near future and will not form part of the current programme.
- By the end of April there will be a defined plan of length (kilometers) of electrical corridors to be addressed before the winter of 2025. This will involve remedial works to mitigate the risk of further forestry falling on the electrical networks in areas most affected by Storm Éowyn. There is extensive works to complete and while priority areas will be cleared in 2025, the plan will continue through the winter of 2025 and into 2026.

- A multi-year programme for the clearance and /or widening of corridors across the Coillte forestry portfolio will be necessary. This will require wider stakeholder input to establish the approach and agreements (timing, corridor width, risk-based approach, etc.) to deliver this over the coming years.

6.0 Resourcing

ESB Networks deploy approximately 1500 technicians as part of its ongoing network maintenance and refurbishment operations, and at any given time there are also up to 1600 contracting partner resources in the field. While this number has been growing over the last number of years the impact of Storm Éowyn has resulted in the temporary requirement to further increase our resource levels, particularly in our overhead lines resources.
A number of measures have been identified that will be completed by ESB Networks to support both the immediate and longer-term growth, including the procurement of temporary emergency timber cutting resources. It is also intended that ESB Networks will continue its engagement with relevant bodies, including the Education and Training Boards (ETBs) and Department of Enterprise, Trade and Employment (DETE), for the ongoing development and growth of the available overhead lines and timber cutter resource base. Work has commenced to develop a national overhead lines apprenticeship programme and also the extension of the arborist apprenticeship programme into a wider number of the ETBs, both of which are expected to support the growth in available resources. The progress of these actions will be monitored and reported on over the next 6 months.

7.0 Preparing for the Next Storm

7.1 Material and Spares Review

After the review of materials usage following Storm Darwin in 2014, material was set aside for use in exceptional storm situations only, where this stock is set aside in separate storage to normal stock. This material has been kept under review after every significant storm event since 2014. Normal stocking levels are more than adequate for typical storms, therefore use of materials ringfenced for exceptional events has not been required frequently. It has only been drawn down for three significant events since Darwin (2014), Ophelia (2017), Darragh (Dec 2024) and Éowyn (Jan 2025). It should be noted that storm Darragh and storm Éowyn were back-to-back and demonstrated ESBN's material supply chain resilience. For example, Storm Éowyn required over 4,350 poles where 27,000 poles were in stock.

Following Storm Éowyn, ESBN has completed a full review of the materials usage and remaining material for major storm restoration. 176 key individual material items have been identified and there is now a requirement for this material to be replenished and stocked in advance of the winter of 2025/2026. It is planned to have these required material stock levels built up by October 2025. This work has already commenced.

In addition to the review of the remaining materials, the usage of the materials during the storm was also examined. The output of this assessment is a recommendation to increase the stock holding levels reserved for storm scenarios above the pre-Storm Éowyn levels to build in further risk mitigation to material availability for storm restoration efforts. As a result, the storm stock levels will now be doubled in size by October in order to cope with the increased level and frequency of storm activity.

7.2 Relationships with Partners & Industry Stakeholders

Reflecting the hugely positive and timely support from across Europe to Storm Éowyn restoration efforts and the growing need for mutual utility support, ESB Networks will be engaging with its European colleagues -

- To strengthen existing relationships with utilities across Europe.
- To develop and agree Memorandums of Understanding's and agreements for mutual support to provide emergency storm restoration assistance.
- Engage with other utilities to explore the measures being used across Europe, and wider, to prepare for future weather / storm event response and restoration.

7.3 Storm Review

ESB Networks have commenced the process of establishing a formal storm review. It will review ESB Networks response to Storm Éowyn, and the restoration effort. While not pre-empting the findings or recommendations of this review, ESB Networks will undertake the measures set out in this report, having regard to the impact and damage caused to our network, while focusing on the areas which are deemed to be most vulnerable in the aftermath of this recent storm. This review may identify further recommendations to be implemented in advance of future storms.

8.0 Delivery Management of Action Plan

ESBN are committed to continuous engagement with all relevant stakeholders over the lifetime of this plan. There will be an appropriate governance and management structure established to manage the deliverables that are set out in this proposed plan.

A forum has been agreed between respective Government Departments, Coillte and ESB Networks to collaborate on mitigating the forestry risk. This forum will report regularly to a steering committee to ensure deliverables are met.

ESB Networks has a regional management structure along with its Contracting Partners division to ensure delivery of this plan and will issue a progress report to DECC at milestone intervals detailing progress.

Press Statement Of Minister O'Brien

Minister O'Brien announces new measures to enhance the electricity grid and to increase its resilience Published on 5 February 2025

Minister Darragh O'Brien has announced new measures to enhance the electricity grid and to increase its resilience. The Minister met with representatives from the Commission for Regulation of Utilities (CRU) and ESB Networks (ESBN) on Friday, to discuss the Storm Éowyn response and the impact on customers.

The Minister has requested a number of actions be taken, once the initial storm response has been completed. These measures include an enhanced Winter 2025 Grid Resilience Plan. This will be developed within the next month and will be implemented by ESB Networks between March and October to enhance the resilience of the grid in the most vulnerable locations for the upcoming winter. The ESB have identified a number of initial actions, including increasing the stock holding of spare parts for the electricity network, creating forestry corridors to protect overhead line corridors, and enhancing already strong relationships with partners across Europe.

The Minister has also requested a full review by ESB Networks and CRU, as part of the PR6 (Sixth Annual Price Review) decision-making process of the planned grid enhancement and in light of the damage caused by Storm Éowyn, with specific additional projects and investments identified to future proof Ireland's energy grid and to adapt to the challenges of climate change.

The Minister also set out that he will work closely with the Minister of Finance and the Minister of Public Expenditure, NDP Delivery and Reform – to support CRU and ESBN increasing their workforces in order to protect citizens.

In the interim, the Minister has received assurances from ESB Networks that they are taking all actions necessary to restore power to customers. The Minister paid tribute to local authorities, utilities and principal response agencies and in particular the ESB Networks crew members and the crews who have come to assist from the United Kingdom, France, Finland, Germany, Austria, Norway and the Netherlands, for their continued efforts to restore power to the country as quickly and as safely as possible.

Speaking about these measures, Minister O'Brien said:

"These storms are becoming more regular and more destructive and there is a need to take immediate action to ensure that we increase the resilience of the electricity system, and therefore of the country, to this type of event. I met with representatives from the CRU and ESB Networks, to discuss the Storm Éowyn response and the impact on customers. A number of actions emerged from

these discussions and I have outlined these actions in a memo to government, which has been considered today.

"While the actions I set out are crucial to increasing the resilience of the electricity system in the wake of Storm Éowyn, my priority, and the priority for government, has been and remains to be ensuring the safety and wellbeing of our citizens – by assisting the restoration of power to all as quickly and as safely as possible, and to ensure that all vulnerable customers are looked after in whatever manner is needed.

"As of this afternoon, 18,000 customers remain without power. ESB Networks have restored power to 750,000 customers. I know that some customers are without power for nearly two weeks in some areas, due to the scale of the damage to the electricity grid. Every effort is being made to restore electricity to the remaining customers as soon as possible. I have and will continue to engage directly with ESB Networks to ensure that they have the full support of the State to respond to the storm.

"We are providing support to vulnerable individuals who are without power and will continue to do so. I know that colleagues in ESB Networks are working with An Garda Síochána, the HSE and other departments and agencies to ensure every vulnerable customer gets assistance."

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