Foreword

Welcome to ESB Networks' 2024 Distribution Annual Performance Report. The Commission for the Regulation of Utilities provided feedback on the 2023 Distribution Annual Performance Report and requested the inclusion of further information on network electricity losses at the Distribution level. We have included further information in this report.

The purpose of this report is to detail ESB Networks' progress and performance during 2024, delivering on the fourth year of plans approved by the Commission for Regulation of Utilities (CRU) under Price Review 5 (PR5). As we enter the final year of PR5 we are looking forward to PR6 and planning for the significant investment required to meet the many requirements of the electricity network into the future.

Following extensive stakeholder engagement throughout 2024, ESB Networks submitted its Business Plan for Price Review 6 (PR6 Plan) to the CRU in Q4 2024 outlining our proposed investments in the network over the period 2026 to 2030. The PR6 Plan addresses the strategic objectives and outcomes identified by the CRU in their PR6 Strategy Paper, including 'Secure and Resilient Networks and Supplies', 'Decarbonised Electricity' and 'Empowered Customers' as well as our own long-term vision for the network, as set out in our Networks for Net Zero Strategy.

The Plan includes a significant increase in capital investment in the electricity network across the five-year period and will encompass the delivery of targeted network capacity reinforcements to enable renewable generators to connect to the network and meet growing demand for electricity across all sectors including housing.

Our PR6 investment programme will be significantly bigger in scale and ambition than previous price reviews, reflecting the strategic importance of the electricity network in enabling social, economic, and environmental transformation in line with Government policy. We are seeking to address the immediate and future needs of customers by aligning our Plan with relevant policy objectives and targets, including those contained in the Housing for All, National Planning Framework, the National Development Plan 2021-2030, and the Climate Action Plan.

Ireland's electricity network is a fundamental part of our national infrastructure, essential for economic growth, the maintenance of our modern economy, and the achievement of key policy objectives related to housing, industrial growth, and climate change. Investments in the electricity network have a direct impact on people's lives both now and in the future. These investments influence national competitiveness, our capacity to attract foreign direct investment, the rate of new housing development, and our legally binding commitment to achieve net zero emissions by 2050.

Beyond 2030, our Strategy outlines ESB Networks' commitment to investing in a distribution network which will support Ireland's goal of achieving net zero no later than 2050. The transformation of the electricity system continues, including the integration of renewable energy sources, smart meters, flexibility, digitisation, and process improvements to enhance customer experiences.

We are committed to enhancing our processes and services for our customers by increasing online service accessibility. The rising number of registrations for the Customer Online Account highlights progress in this initiative.

ESB Networks is continuing to work to improve the reliability of the network for customers. With increased storm activity, an aging network, increased network demand, increased third party network interference and impacts from forestry / timber, there has been a dis-improvement in overall average network performance, which is measured by customer minutes lost. We are continuing to invest to improve network reliability and a step change in investment has been set out in our Price Review 6 Business Plan, which runs from 2026 to 2030.

The storms in 2024 underscored the continued need for the proposed doubling of investment in network resilience as set out in PR6. We will continue to enhance the resilience of our network to mitigate against the increasing effects of climate change.

We are continuing to investigate new innovative ideas that will help provide the service that our customers require. In 2024 we examined new technologies that can improve our service efficiency across the business in areas such as network reinforcements, network planning and climate adaptation.

We are also working to identify and bring forward interim solutions to meet immediate customer needs in areas of limited network capacity, where it is possible to do so. ESB Networks has published a capacity heat map and capacity workbooks on our website to provide insights to customers on current and planned network capacity.

Solar continues to be a growing force in renewables in Ireland with continued and significant levels of micro and mini generation connections that are now making a major contribution towards our 2030 renewable targets. Grid scale solar also continues to grow, however as has been the case in recent years, we need to see more renewables coming on board each year. ESB Networks is continuing to improve its processes and customer engagement to help bring projects to fruition and to meet new connection policy requirements.

ESB Networks recognises that stakeholder engagement is key to helping ESB Networks deliver the low carbon transition. The transition to a net zero future will have a significant impact on our customers' day-to-day lives and success will not be achieved without ongoing active customer and stakeholder participation, engagement, and support. Progress can only be achieved through continued collaboration with our customers, stakeholders, and business partners so that we deliver a clean electric future together.

I hope you find the information in this report, which summarises ESB Networks' performance in 2024, both informative and useful.

Nicholas Tarrant
Managing Director
ESB Networks

2024 Highlights

Renewable Generation
534 MW of utility-scale wind and solar added in 2024 (Transmission and Distribution). Total **6,324 MW** of renewables connected. **26** ECP connection offers issued for distribution, totalling **206** MW.

Environment
16% reduction in carbon footprint from electricity usage in our buildings in 2024

Microgeneration
43,800 applications were processed in 2024 (an increase of **30%** from 2023)

Capital Investment
€1,149.6m expenditure in 2024 – **€683.2m*** invested in distribution capital programmes and **€466.4m** of distribution operating expenditure

Beat the Peak
had **25,619** active customers by end of 2024

Customer Online Account
155,000 registrations to date

New Connections
37,565 total new connections, including **32,695** domestic and **4,870** commercial

MV Network
378km MV network converted from 10 to 20 kV

Smart Metering
325,786 additional smart meters installed. (Total installed at end of 2024 **1,894,934**)

PowerCheck
had over **4.1m** unique visitors

*Capital Investment Includes Smart Metering Capex not included in previous years.
Note Transmission Expenditure in 2024 totalled €295.5m – €220.5m capital expenditure and €75.5m operating expenditure.

Executive Summary

ESB Networks is at the forefront of Ireland's energy transformation, striving towards a sustainable future through a low carbon electricity system. We are supporting Ireland's target of 80% of our electricity being sourced from renewable energy in 2030. This ambitious goal aligns with our commitment to the electrification of various sectors, including heat and transport, fostering the adoption of eco-friendly technologies like heat pumps and electric vehicles. Our continued enablement of mini, micro and small scale generation as well as the connection of grid scale renewables, is making a significant impact on the volume of renewable generation being produced. We will continue to support Irish homes, communities, and businesses as they transition to low carbon technologies, as Ireland strives for a net zero future.

€1,149.6m expenditure in 2024 including €683.2 million capital expenditure (up from €477.6 million in 2022), on the development and renewal of the distribution network. This underscores our dedication to infrastructure enhancement and service reliability. There was a further €466.4 million of operating expenditure on distribution operation and maintenance activities in 2024.

We connected 534 MW of wind and solar power in 2024. This contributed to the 6,324 MW of renewables now on the electricity network (distribution and transmission), with wind generation alone accounting for 5,081 MW.

Solar continues to grow, with 43,800 microgeneration connection applications received in 2024. This brings the total number of microgeneration connections to 121,700 by the end of 2024, providing approximately 500 MW of renewable generation capacity.

We processed 40 Enduring Connection policy (ECP) -2.4 applications in 2024. This resulted in 26 connection offers being made from a range of sources (including wind and solar), totalling a potential 206 MW.

The demand for connection to the electricity network was strong again this year, with 2024 seeing 37,565 new demand connections, including 32,695 connections to domestic premises. To meet this demand and improve our customer service, we are digitising our processes, enabling more online engagement with our customers and increasing the number of people we have to carry out connections.

The smart meter programme continues at pace, with 325,786 smart meters installed in 2024. In total, 1,894,934 smart meters have been installed to date.

ESB Networks is committed to enhancing the reliability and efficiency of our networks. The focus of our continuity investment programmes is to minimise the impact of unplanned outages on our customers. We continue to roll out measures to improve the continuity of the network, such as targeted network automation, prioritised investments and ongoing vegetation management.

The deployment of Automated Protection Devices (3 Phase and Single Phase) saw a substantial increase in 2024, marking notable progress. A total of 174 three-phase units were installed, nearly tripling the volume delivered in 2023. Additionally, 194 single-phase spurs were equipped with Fusesaver or Tripsaver devices - a significant rise compared to the 65 installations in the previous year

Innovation remains at the forefront of our agenda, with 74 new ideas examined and 450 stakeholder engagements took place through webinars, conferences, publications, and bilateral meetings. This important programme of work will continue into 2025.

As we continue to implement our Public Safety Strategy (2021 – 2025), we reaffirm our core commitment to the safety and well-being of the communities we serve and our people.

In terms of environmental performance, we continue to actively reduce our environmental footprint, with further reductions across our fleet, buildings, and waste material while working to reduce our emissions in other areas such as sulphur hexafluoride (SF6). In 2024, 125.9 kg of SF6 was emitted due to equipment faults, representing 0.06% of the total installed inventory of SF6. This compared favourably to other European utilities.

Contents

2024 Key Statistics

ESB Networks DAC is the licensed Distribution System Operator (DSO) in the Republic of Ireland. The Irish distribution electricity system includes all distribution stations, overhead electricity lines, poles and underground cables that are used to bring power to almost 2.5 million domestic, commercial and industrial customers.

Annual Financial Performance

- Approved DUoS revenues of **€1,181.72m**
- **€683.2m**[1] invested in distribution capital programmes in 2024
- **€466.4m** of distribution operating expenditure

Connecting more Renewable Generation

- **6,324 MW** of utility scale renewables connected to date, with **5,081 MW** of this being wind generation
- **534 MW** of utility scale wind and solar connected in 2024
- **43,800** microgeneration connection applications to the electricity network were facilitated in 2024, bringing the total number to **121,700** by the end of 2024
- **1,545** new mini-generation customers have installed and connected their generators, from a total of **3,500** applications received by the end of 2024
- **550** small scale generation applications with **260** connected by the end of 2024
- **40 ECP-2.4** applications processed during 2024, leading to 26 connection offers totalling 206 MW

New Connections and Growth

- **37,565** total new connections, consisting of:
  - **32,695** new domestic connections (approximately 425 MVA of contracted maximum import capacity (MIC), which results in approximately 162 MVA of additional load on the distribution system (after diversity maximum demand added))[2]
  - **4,870** new commercial connections (approximately 162 MVA of contracted MIC)
  - **6.52%** of the energy that was put into the distribution system was accounted for as losses in 2024 (slightly lower than the 6.75% seen in 2023). We are managing this by undergoing a program to convert our 10 kV network to a 20 kV network and by choosing energy efficient designs when making network investment decisions

Environment

- Electricity usage in our buildings and the associated carbon footprint was down **16%** in 2024, compared to 2023
- **100%** of Networks assets including Oil Filled Equipment, Scrap Metal, Transformer Oil & Network Poles are recycled

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1   *Includes Smart Metering Capex*

2   *The ADMD can be thought of as the average peak load per customer and is a crucial metric in the design of LV networks here in Ireland and internationally*

Innovation

- **74** innovation ideas examined in 2024
- **18** projects currently in delivery and 12 projects completed in 2024
- Over **450** stakeholder engagements took place through webinars, conferences, publications, and bilateral meetings
- Since the start of PR5, approximately **50** innovation projects have been progressed, with nearly 50% transitioned to Business as Usual (BAU)

Safety

- ESB Networks successfully retained its certification to the international ISO 45001 Occupational Health and Safety Management System standard
- Continued to implement our Public Safety Strategy (2021 – 2025), which is anchored in the core purpose of our business and continues to be a core strategic priority and area of focus
- During 2024, we served **203** notifications to stop work to third parties, working unsafely around our network," which is up from 141 in 2023

Smart Metering

- **325,786** additional smart meters were installed in 2024
- **1,894,934** smart meters installed in total by the end of 2024

Customer Engagement

- In 2024, our Customer Online Account achieved external recognition through awards for improving customer journeys and experience, namely Public Sector Digital Transformation Award Winner, CX Impact Award; Digital Impact on CX and Digital Transformation Award: Best CX Impact

- Over 155,000 registrations to date for our Customer Online Account and 27,500 customers signing up for the 'Time for Rewards' programme in 2024
- There has been an average minimum increase of 50% of customers accessing the initial services offered in the Customer Online Account, i.e. to access energy consumption data (including smart metering data), submit a meter reading, check their MPRN, new connections, and outage information

Distribution System Statistics

- c. **154,000** km of overhead lines
- c. **28,000** km of underground cable
- c. **568** HV substations
- c. **24,000** MV ground mounted substations
- c. **254,000** MV pole mounted transformers
- c. **99 MW** of HV transformer capacity added
- c. **2.5 million** customer meters

Distribution network asset replacement and maintenance programmes

- **378** km MV network converted from 10 to 20 kV
- Continued delivery of public safety patrolling programmes
- **441** asset replacements at high voltage sub stations
- Patrolling and refurbishment of MV overhead line network
- **181** MV ring main units replaced
- **1,382** Low Voltage (LV) minipillars replaced

2024 Performance Summary

Metric	2024 Target	2024 Performance	2024 Financial Incentive	2023 Performance	2022 Performance	2021 Performance
Customer Minutes Lost (CML) – unplanned outages	78.7	117.47	€-10.0m	105.592	103.34	95.99
Customer Interruptions (CI) – unplanned outages	112.7	137.9	€-10.0m	126.4	127.12	120
Worst Served Customer	>9,000 WSC improved by over 20%	11,360 customers meet the success criteria in 2024.	N/A	13,569 customers meet the success criteria in 2021 and 2022.	N/A	N/A
Customer Satisfaction (National Customer Care Centre)	90%	90.84%	€0.7m	91.69%	83.58%	85.90%
Customer Satisfaction Survey	82.50%	78.19%	€-2.7m	80.10%	81.82%	82.88%
Smart Metering Delivery	450k-500k	325,786	€0.216m	464,957	481,793	382,188 Meters
Smart Metering Functionality		Partially completed with some deferred	€0.45m	Partially completed with some deferred	Partially completed with some deferred	Completed
Smart Metering Customer Satisfaction	>80% Customer Satisfaction	93% net satisfied	€0.36m	96% net satisfied	95% net satisfied	97%-98% net satisfied
Stakeholder Engagement	10	7.61	€0.57m	7.6	7.63	7.54
Processing Generation Connection Applications	Process ECP offers 30 days before batch deadline	Completed	€3m	Completed	Completed	Completed
Outage Information	Balanced Scorecard	97%	€0.97m	90%	100%	81%
Flexibility	Balanced Scorecard	95%	€2.85m	90%	98%	100%

Metric	2024 Target	2024 Performance	2024 Financial Incentive	2023 Performance	2022 Performance	2021 Performance
Low Voltage Network Visibility	Balanced Scorecard	81.70%	€2.45m	84.30%	39%	98%
Joint DSO/TSO Coordination	Balanced Scorecard	92.30%	€2.77m	78.30%	71%	59%
Independent Role of the DSO	Balanced Scorecard	TBD	€0.93m	56%	85%	82%
No. of registered vulnerable customers	N/A	97,513	N/A	87,202	70,520	66,936
Total number of outages (planned and unplanned)	N/A	48,190	N/A	44,252	45,540	42,687
New Demand Connections	N/A	37,565	N/A	40,928	38,924	29,553
Capital Expenditure	Within PR Allowance	683.2m (inc. Smart Metering)	N/A	477.6m	€349m	€328m

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Customer Service

1. Customer Service

We work hard to deliver a first-class customer experience, developing our customer service channels, touch points and offerings. We are committed to improving on our performance every year to ensure customers' needs are met.

Our Customer Charter is a set of commitments to our customers.

1. We aim to restore supply in less than four hours for 95% of fault outages.

2. We will give you at least two days' notice of an outage for planned work on the network.

3. If your main ESB Networks fuse has failed, we will call out free of charge, within three hours if you call us between 8.30am and 11.00pm, or before 11.30am the next morning if you call after 11.00pm.

4. We will install an electricity meter for you within three working days (for domestic customers, five working days for business customers).

5. We will send you a cost quotation for your new connection if you are building a new house or farm building, setting up a small business or renovating an older property, within seven working days if no site visit is required, or 15 working days if a site visit is required.

6. We will complete your new connection to your new house or premises within two weeks of receiving your 'Safe Electric Completion Certificate' if you apply and pay giving us ten weeks' notice.

7. We will contact you within ten working days if you are concerned about your supply voltage.

8. We will resolve verified voltage concerns within 12 weeks (unless major reinforcement is required).

9. If you request a visit from an ESB Networks' network technician, we will visit at an agreed time, or contact you the day before if we cannot make the agreed appointment.

10. Where we agree that you are entitled to a refund, we will make the refund within five working days.

11. If you use the CRU complaint resolution service, we will honour any financial settlement they direct within ten working days.

12. If we fail to meet a charter commitment, or (for 1 and 2) receive a valid claim, we will send you a cheque within ten working days or pay you an additional €35.

In 2024, 4,439 charter payments were made to our customers, compared to 4,223 in 2023 and 3,631 in 2022. 84% of all charter payments corresponded to the following four categories.

- **Planned supply interruptions (failing to provide the necessary 2 days notice).**
- **Connection quotation (failing to provide quotation within the SLA timeframe).**
- **New connection (failing to connect within the 2-week timeframe).**
- **Payment (failure to pay charter payment within the 10-day timeframe).**

Putting customers at the heart of what we do

Our Networks for Net Zero Strategy that launched in 2023, is focused on leading the transition to a secure, affordable low carbon future. Central to the strategy is the 'Empowered Customers' strategic objective to support customer's transition to net zero. Our customer experience programme is committed to servicing customers with connections to a resilient network and to facilitate customers to adopt low carbon technologies like electric vehicles, solar and heat pumps. Digital is a key enabler of our strategy, helping to streamline customer journeys, grow our suite of self-serve digital offerings and make interactions as simple and as convenient as possible for our customers. Some examples of our key customer initiatives are provided below.

1. Customer Centricity. A key objective of the customer experience programme is to embed customer centricity across ESB Networks. We developed a Key Performance Indicator (KPI) dashboard on customer satisfaction, customer operations, complaints, brand and customer touchpoints. This is shared monthly with the relevant teams. We also established a customer improvement programme which is focused on improving our core customer journeys: connections, outage management and voltage services for customers.

2. New Connections. Over 30,000 homes and business require a network connection per annum. Our objectives are to deliver a simpler online application process, proactive communication and an enhanced tracking service. In 2024, we continued the journey of digitisation by enabling customers requiring line diversions and ESB Networks asset relocation to apply digitally. We also digitised the application form required by customers seeking permission to export excess solar energy to the grid (c. 45,000 per annum). We will complete the digitising of the remaining application forms in 2025.

3. Power Outage. Proactive, accurate power outage information was previously identified as a critical area for improvement. The PowerCheck website is a key tool in this regard, which saw 4,148,251 visitors in 2024, with 13,455,921 page views.

4. Website. Our website (esbnetworks.ie) evolved consistently throughout 2024, with improvements made to the user interface design and user experience design. These improvements enhanced key customer journey navigation and the self-serve options through integration of the online account. All 270 pages of our content on esbnetworks. ie have been translated into Irish and tested to ensure linguistic accuracy and cultural relevance.

5. Customer Online Account. Our Customer Online Account, which launched in November 2022, brings personalised digital services together to enable customers to access electricity services. The customer portal represents a step change for ESB Networks, as it creates an enduring digital relationship with our customers. We surpassed 150,000 registrations with over 150,000 downloads of smart meter data recorded. .

6. Contact Centre of the Future. This aligns with our strategy to transition simple tasks from call centre agents to customer self-serve.

Key Successes During 2024

Over the course of 2024, a range of initiatives to improve the customer experience and overall customer satisfaction were implemented. These include;

Contact Centre Applications

- *Knowledge Base, National Customer Contact Centre's* (NCCC) 'Google' for Agents, allows staff to browse and search improving the consistency and quality of information we are able to provide to customers.

- *New Social Media App*. A new app which integrates all our customer contacts from different channels, X, Facebook, and Instagram onto one platform for ease of use by our Agents.

- *'Professional Contact Centre Enterprise' upgrade*, the backbone application for the Customer Contact Centre, achieved a deep technical upgrade to stay secure and current with our core technology stack which supports our customers.

- *Call auto transcription and sentiment App (Tethr)*. An application which auto-transcribes all of our inbound customer calls and uses advanced analytics and machine learning to sentiment score and enable call driver analysis for reviewing opportunities for improvement in customer service.

- *DR Solution - Webex Contact Centre*. Implementation of a Cloud Contact Centre solution for Disaster Recovery scenarios (e.g. cyber-attack on existing contact centre systems).

Contact Centre Enhancement of Organisation Structure

- *Proactive Quality Assurance*, 4 addition FTE (Full Time Equivalent) positions were created to support training and quality assurance in the NCCC. This capacity allows for the implementation of the new Quality Control Framework document, detailed above.

- *Digital Application Competency*, 4 additional FTE positions were created to support the competence and capacity required to support new digital applications such as Powercheck, Customer Login/Portal, Planned Outage Digital Notifications Platform, and other in pipeline digital Applications.

Customer Online Account

- In 2024, our Customer Online Account achieved external recognition through awards for improving customer journeys and experience, namely Public Sector Digital Transformation Award Winner, CX Impact Award; Digital Impact on CX and Digital Transformation Award: Best CX Impact.

- There has been an average minimum increase of 50% of customers accessing the initial services offered in the Customer Online Account, i.e. to access energy consumption data (including smart metering data), submit a meter reading, check their MPRN, new connections, and outage information.

- Popular services like Timber Cutting Assessments, Voltage Issues and Rewiring were added to the Customer Online Account. In addition, online payments and enhanced security features were added.

- We have surpassed 155,000 registrations to date, with 6-8000 customers signing up monthly, over 296,000 downloads of smart meter data recorded and 27,500 customers signing up for the 'Time for Rewards' programme.

New Connections

- New connections, domestic, commercial and development online applications, including accessing and digitally signing the connection/development agreements, saw 93% customer adoption by the end of 2024, as the move away from paper-based and manual application processes continued.

- Online applications were introduced for other high-volume microgeneration and unmetered application types, as well as the relocation of poles or lines, achieving high adoption rates.

- The digitisation of the final cohort of New Connection Applications, Minigeneration, was also commenced and is due for completion in mid-2025.

Outage Management

- In 2024, PowerCheck had 4,148,251 unique visitors, with 13,455,921 pageviews.

- Our new digital notification service 'Keep Me Updated' was launched on www.Powercheck.ie in 2023. This allows customers to request ESB Networks to keep them updated (by SMS or email), about a power outage (planned or unplanned) that they are interested in (for example, related to changes to Estimated Restoration Times (ERT) or power restored times). In 2024, 12% of visitors to PowerCheck used the 'Keep Me Updated' service.

- Outage management services are consolidated in PowerCheck ('Check My Power Status' and 'Log a Fault'). In 2024, 22% of visitors selected the 'Check My Power Status' feature and 64,780 customers completed the 'Log a Fault' feature on PowerCheck.

- ESB Networks' vision and solution for digital notifications for planned power outages was delivered on the 14th of November 2024. This solution is an enhancement of the existing postcard notification service for planned power outages. All customers with a valid mobile number will now receive SMS notifications along with the postcard that issues. An initial notification SMS will issue 5 days before the planned outage, a reminder notification the day before and any relevant estimated restoration updates on the day of the planned outage. In 2024, 55,752 customers benefited from the enhanced notification service.

# How customers interact with ESB Networks

National Customer Care Centre

ESB Networks' National Customer Care Centre (NCCC) is an award-winning contact centre with 16 years of accreditation from the Contact Centre Association (CCA). The 24/7 facility is the gateway for 2.5 million electricity customers who can make queries relating to their electricity supply, faults, new connections, emergencies or general questions. Customers contact us across various channels such as phone, email, and social media applications.

The number of customer contacts handled by ESB Networks from 2020 to 2024 is outlined in the chart below. In 2024, 1,335,202 customer contacts were handled, compared to 1,399,160 in 2023.

The contact breakdown for 2024 is as follows.

456,882 telephone calls

253,398 emails, meter reading, social media management

624,922 automated responses to customers on no supply, meter reading, fault logging services

Calls and Emails Answered
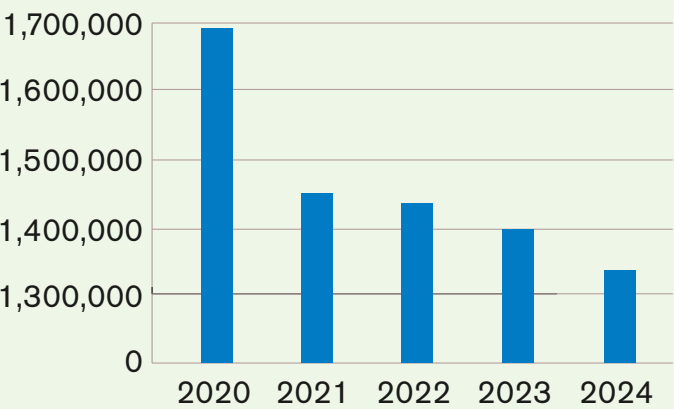
Performance in the Customer Contact Centre from 2020 to 2024 is provided in the table below. In 2024, we answered 90% of calls within 20 seconds which is in line with the previous year. Similarly, the statistic related to the percentage of calls dropped improved in 2023 relative to recent years.

National Customer Care Centre Performance

Call Handling Response	2020	2021	2022	2023	2024
Percentage of calls answered within 20 seconds[1]	84.23%	75.44%	73.85%	91.15%	89.81%
Percentage of calls dropped[2]	4.59%	11.13%	11.98%	3.17%	3.84%
Networks customer calls to the call centre[3]	451,147	401,730	443,510	441,198	456,882

## Contact Centre Association standards

ESB Networks' Customer Care Centre continues to be a member of the Customer Centre Association (CCA) and we actively engage with members on developing contact centre trends.

Customer Interactions During Storms

Weather-related outages or damage cause significant disruption to ESB Networks' customers. During such incidents, customers contact ESB Networks via a variety of engagement channels including telephone, Interactive Voice Response, ESB Networks' website, Powercheck.ie, email, social media, and SMS. This results in varying peaks of activity across the various channels of communication. Mainstream media, TV, and radio campaigns are also used to communicate and engage with customers in a timely and proactive manner. We also have a support service with an external partner that provides additional support for no supply/emergency calls, particularly during periods of severe weather and large electricity outages.

1   *Figures are inclusive of storms, which involve much higher call volumes during these events. This results in challenges regarding the call handling and percentage of calls dropped performance metrics.*
2   *Where the customer has terminated the call without waiting for a response.*
3   *Calls relating to ESB Networks excluding Interactive Voice Response.*

PowerCheck provides customers with real-time fault information on all major faults across Ireland. Customers can use PowerCheck to view what faults and fault clusters are known to our team of engineers and to view active planned outages. Engagement with PowerCheck has increased significantly from 2020 to 2024 as shown in the chart opposite.
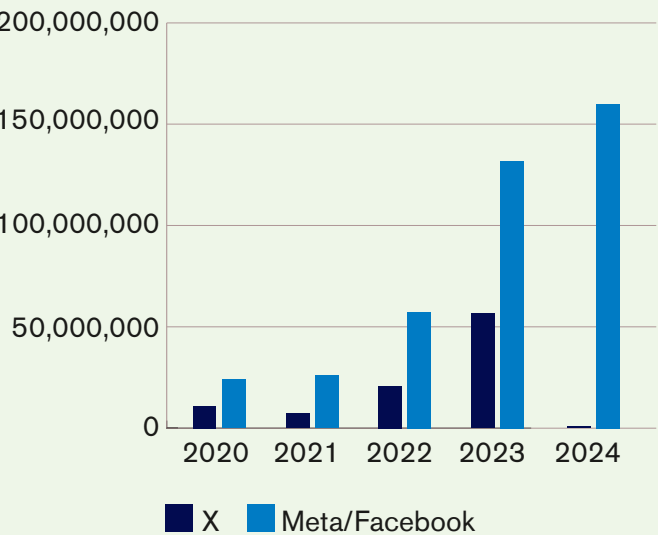

PowerCheck Pageviews
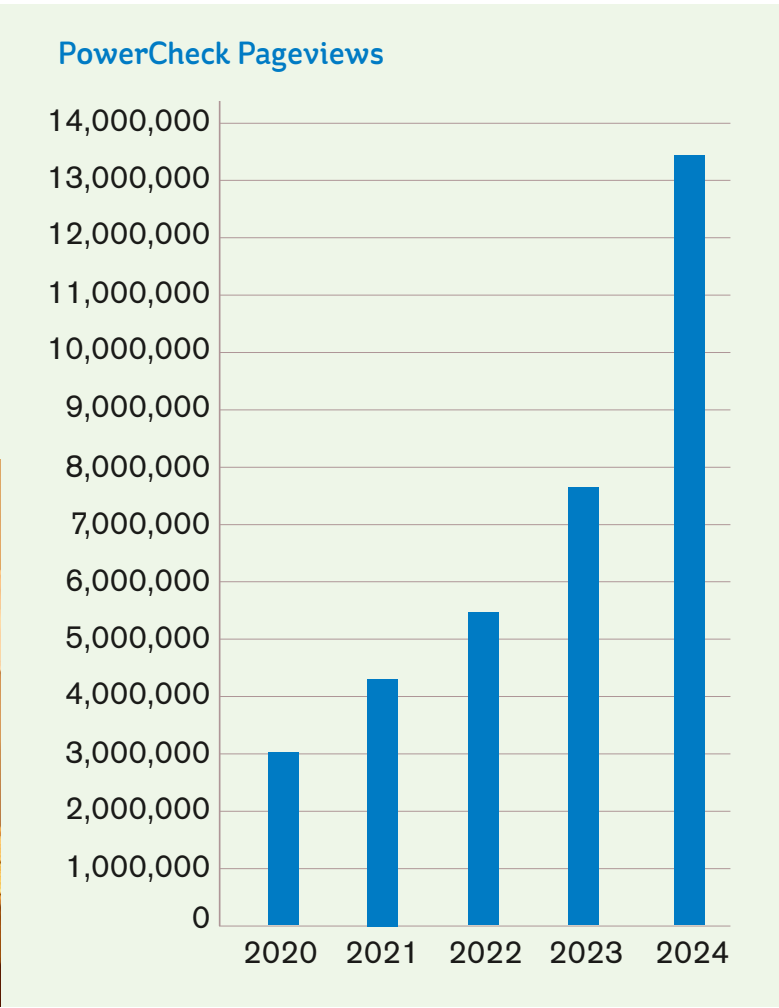
Website and Social Media

We re-launched ESB Networks' website in 2021 with a new design centred on improving customer experience by building a mobile first user interface and improving the key customer journeys throughout the website. In 2023, ESB Networks started a programme of work to further enhance our website to meet both accessibility standards and to further enhance our customer offering for a more efficient self-service experience. This programme of work continued in 2024 to ensure we give our customers an excellent website experience.
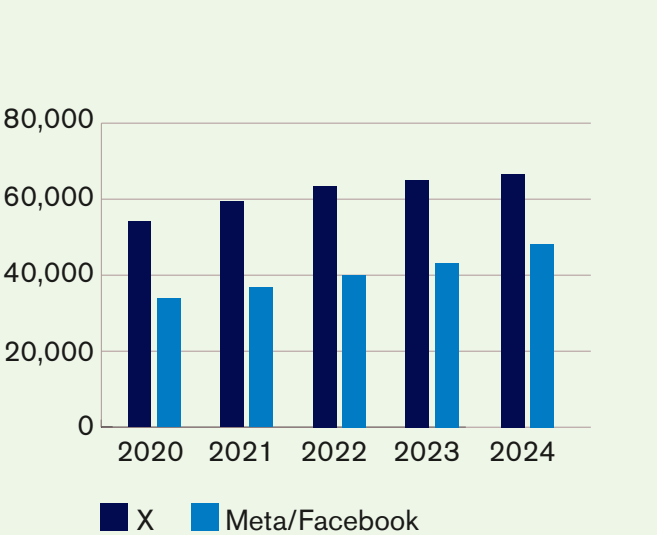
In addition to providing customers with up-to-date information and assurance, the use of social media supports our efforts to provide information to customers via channels other than direct voice contact to the NCCC during fault events. This facilitates our customer service advisors to be more accessible for handling emergency activity during major outage events. Social media channels allow us to provide a source of proactive contact to customers, with advice on storm readiness both in the home and work environments.

The ESB Networks' website and social media platforms are a significant growing touchpoint to our customers, as outlined in the figures below.

Social Media Impressions

X (previously Twitter) is now used as an inbound channel, i.e. for customers to contact ESB Networks and for storm safety communications.

Social Media Followers

ESB Networks has **66,300** followers on X (formerly Twitter), **48,000** on Facebook and **7,913** on Instagram. Through this following, we've achieved millions of combined impressions across social media platforms in 2024, between paid media placements and organic content The split of 2024 impressions across platforms are as follows.

- 843,972 organic impressions on X
- 160.4 million impressions on Meta Shared Platform (consisting of 670 thousand organic impressions and 159.7 million paid impressions)

In addition, our website is seen by our customers as one of the most important touchpoints, in particular Powercheck.ie which received 13.4 million page views in 2024.

Social Media

66,300 Followers on X
843,972 Organic Impressions on X

48,000 Followers on Facebook

7,913 Followers on Instagram

160.4m Impressions on Meta Shared Platform (Organic 670K Paid 159.7m)

13,455,921 Page views on PowerCheck

Customer satisfaction scores 2024

ESB Networks achieved the following customer satisfaction scores in 2024.

- **90.84% ESATRAT (satisfaction rating of NCCC).**
- **78.19% Behaviour and Attitudes Survey (customer satisfaction rating).**

The chart below outlines the customer satisfaction scores (target and actual) from 2020 to 2024 for both the ESATRAT and Behavioural and Attitudes Survey. More information is provided in the sections below.

Customer Satisfaction Scores

Legend: ESATRAT | ESATRAT Target | B&A Survey | B&A Survey Target
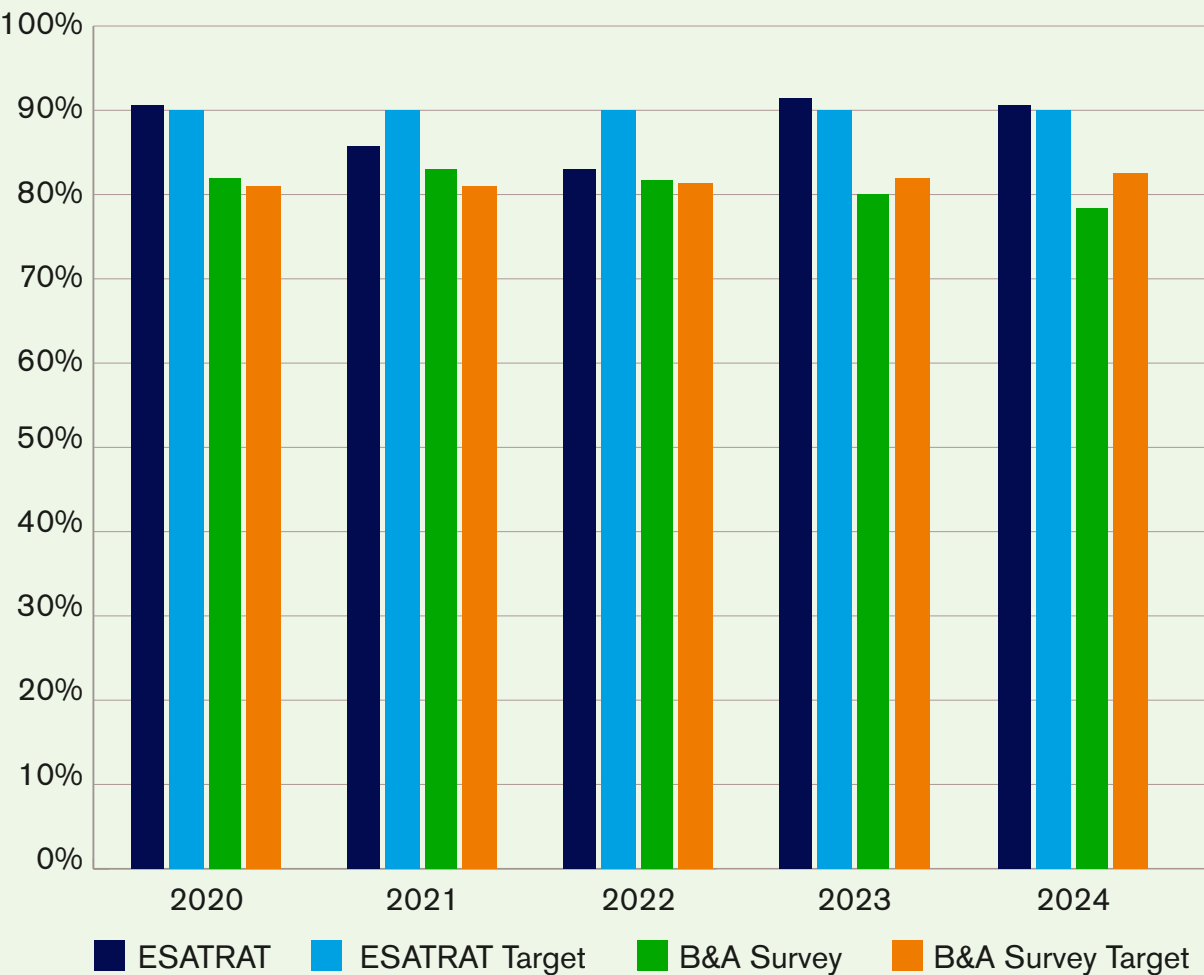
Customer Satisfaction Scores Explained

In the sections below we provide more information about the results of the ESATRAT and Behavioural and Attitudes Survey.

(1) ESATRAT NCCC

The incentivised satisfaction rating of the NCCC outturn score is derived from five KPIs.

1. **Speed of telephone response**
2. **Call abandonment rate**
3. **Customer call-back survey results**
4. **Mystery caller survey results**
5. **First contact / call referral**

The results of the ESATRAT across these five KPIs from 2020 to 2024 are outlined in the table below. In 2024, our combined incentivised outturn stood at 90.84%, compared to 91.69% in 2023. The combination of resource recruitment, training, reduction in meter reading requests, in spite the number of large storms and other weather events, impacted positively on service level and abandonment rate performance throughout 2024. The engagement performance for the mystery shopper and customer call-back KPIs remained stable.

In 2024, the ESATRAT score decreased slightly as a result of the number of storm related power outage events with consequent large call volumes into the Contact Centre. All elements of the ESATRAT remained relatively stable with the exception being the speed of telephone response which dropped 1.34%. Performance on the mystery caller and customer callback survey remained strong.

Breakdown of ESATRAT Incentive

	2020 Target	2020 Actual	2021 Target	2021 Actual	2022 Target	2022 Actual	2023 Target	2023 Actual	2024 Target	2024 Actual
Speed of telephone response	88%	84.23%	89%	75.40%	89%	73.85%	89%	91.15%	89%	89.81%
Call abandonment rate	4%	4.59%	4%	11.10%	4%	11.98%	4%	3.17%	4%	3.84%
Customer call-back survey results	88%	95.00%	89%	94.00%	89%	89.00%	89%	88%	89%	87%
Mystery caller survey results	83%	89.00%	84%	87.00%	84%	82.00%	84%	90%	84%	89%
First contact / call referral	10%	9.54%	10%	11.00%	10%	10.95%	10%	10.01%	10%	10.01%
ESATRAT (total)	**90%**	**90.53%**	**90%**	**85.92%**	**90%**	**83.58%**	**90%**	**91.69%**	**90%**	**90.84%**

The table below outlines the number and type of complaints handled by the NCCC.

The percentage changes in complaints between 2023 and 2024 are:

- Low Voltage: Decreased by 41.03%
- Frequent Outages: Decreased by 0.66%
- Time to Connect Customers: Increased by 59.32%
- Operation Delays and Overruns: Decreased by 5.88%
- Meter Reading & Estimated Reads: Increased by 0.90%
- Other Complaints: Increased by 2.51%
- Total Complaints: Increased by 1.21%

We continue to establish and analyse insights monthly to address the concerns raised by our customers through the complaints process. We endeavour to close complaints with a meaningful response within five working days.

Complaints Handled by National Customer Care Centre

Complaints Received	2020	2021	2022	2023	2024
Concerning low voltage	20	28	18	39	23
For frequent outages	1,931	1,668	1,511	1,674	1,663
Time to connect customers	17	48	58	59	94
Operation delays and overruns	171	167	336	289	272
From suppliers	0	0	0	0	0
On connection costs and budget quotations	0	3	0	0	0
On meter reading and estimated reads	138	321	360	444	448
Other	1,811	1,840	2,517	2709	2,777
Total complaints received	**4,088**	**4,075**	**4,800**	**5,214**	**5,277**

Behaviour and Attitudes Survey, Customer Satisfaction Rating

The incentivised National Customer Satisfaction Rating (Behaviour and Attitudes Survey) outturn score is the average of six KPIs, as shown in the table below.

The overall incentivised score was 78.19% in 2024, down from 80.09% in 2023. This was driven by reduction in the KPIs for the majority of the journeys measured.

Customer Satisfaction Rating (Behaviour and Attitudes Survey)	Overall 2022	Overall 2023	Overall 2024
Voltage complaint rectified (1 year rolling due to small base size)	72.28%	71.76%	74.78%
Unplanned electricity interruptions	82.42%	81.79%	76.90%
Planned electricity interruptions	86.84%	85.63%	80.16%
New connection - scheme builders	80.16%	79.78%	78.14%
New connection - non scheme	89.54%	87.29%	85.15%
New connection - business	75.17%	74.28%	74.03%
Average	81.07%	80.09%	78.19%

CRU Contacts and Complaints

In 2024 ESB Networks' customers made 992 contacts to the CRU, compared to 837 in 2023 (a 19% increase). This was largely driven by smart meters, Communications Technically Feasible (CTF) scores, new connections and the government credit scheme.

In 2024, 171 complaints were referred to the CRU, which was a 19% increase from 2023. These complaints had previously been through the ESB Networks' internal complaints process. These complaints were largely driven by both Smart Meters (39 complaints) and Meter related complaints (estimated readings, time switch and CTF issues)

Just under half (72 out of 171) of these complaints are still pending at the end of 2024 . 18 complaints were upheld and 64 not upheld. 10% (17) have been withdrawn. There was also 139 request for information (on metering , process, adjustment, market messages and Government Credits) from the CRU.

Vulnerable Customers

We all rely on a safe, reliable electricity supply, however, some customers are more vulnerable to loss of electricity supply. A 'vulnerable customer' is a household which is critically dependent on electrical devices, such as medical equipment, or which is particularly vulnerable to power outages during the winter months for reasons of advanced age or physical, sensory, intellectual, or mental health. Vulnerable customers receive priority attention when there is a fault on the network, and when they make contact with our Customer Contact Centre. We take care to give vulnerable customers at least three days' notice of upcoming planned outages so that they have time to make alternative arrangements. At the end of 2024, 97,513 customers were registered as vulnerable customers, an increase of 10,331 from 2023. To register as a vulnerable customer, customers need to contact their electricity supplier who will notify ESB Networks.

Meter Reading

ESB Networks' meter reading consists of three streams, namely quarterly hour remote reading, smart metering and legacy meter reading. The focus of legacy meter reading continues to be on obtaining as many meter readings as possible each year, through email campaigns, text campaigns, and initiatives such as visiting holiday homes during summer months. For manually read legacy sites, ESB Networks schedules four reading visits per customer each year. Where a read is not obtained due to an access issue, a meter reading card is left to alert the customer to submit a reading. If no meter reading is subsequently submitted by the customer, ESB Networks sends a letter when a customer approaches 12 months without a reading. This can also be followed with an email if there is an available customer email address.

ESB Networks' meter reading performance from 2020 to 2024 is outlined in the table below. In 2024, ESB Networks successfully completed four scheduled visits for 93.66% of customers (down from 96.03% in 2023) and at least two scheduled visits for 98.05% of customers (down slightly from 98.44% in 2023). ESB Networks also aim to obtain one actual meter read per year for 98% of all customers (either from our meter reading staff and contractors or from the customer). In 2024 the result achieved was 97.06%. ESB Networks has a target of 99% of customers without back-to-back meter estimates and the result delivered for 2024 was 99.61% (up from 99.14% in 2023).

Meter Reading Performance

	2020 Performance	2021 Performance	2022 Performance	2023 Performance	2024 Performance
Four Scheduled reading visits per annum	55.72%	89.42%	91.50%	96.03%	93.66%
Two scheduled reading visits per annum	99.95%	99.68%	98.60%	98.44%	98.05%
One actual read per annum	96.15%	96.77%	96.90%	96.51%	97.06%
No consecutive block estimations	81.53%	96.19%	97.70%	99.14%	99.61%

ESB Networks supported billing and adjustments for 1,115,132 customer meter reads in 2024. Electricity suppliers issued 922,191 meter reads to ESB Networks for review and validation and a further 192,941 customer reads were received through internal systems. For legacy sites there is a high volume of traffic. This reflects the external environment at the time, as the frequency of meter readings sent in by customers likely increased due to rising energy bills. ESB Networks' key focus is to maintain a meter reading presence across a geographical spread of 34 planner groups, to support the manual read activity. This work compliments the roll out of smart metering nationally and it ensures that our systems and processes are best positioned to deliver an exceptional customer delivery and experience.

Estimated Response Time for fault outages

The Estimated Restoration Time (ERT) Accuracy Incentive runs over the PR5 period and measures the performance of the DSO in improving ERT Accuracy for fault outages across the network. In recognition of the importance of customers planning around the outage information provided to them, this incentive focuses on the accuracy of the information provided as opposed to the speed of power restoration.

The initial two years (2021, 2022) focused on establishing the ERT monitoring, recording and data assurance processes for fault outages, developing an ERT Pilot and setting future ERT targets. The milestones in the final years (2023, 2024 and 2025) of PR5 focus on these actual ERT targets and the performance against them.

The CRU outlined three elements to be delivered in 2024 as detailed in the table below, taken from CRU 202405 [1]. ESB Networks has delivered on all three of these key elements in 2024.

Detailed ERT Balanced Scorecard Requirements and Incentive Allocations

Elements	Required Evidence
1. Delivery against Year 4 Target	Evidence showing year 4 target for non-storm ERT <1hrs was met.
	If necessary, provide evidence showing why targets were not met.
2. Refinement of data and continual improvement	Summary of the 2023 lessons learned.
	Report ERTs within and outside normal working hours separately.
	Evidence of how new ERTs are determined from analysis of data acquired.
	Reporting on changes to ERT accuracy for 2018-2023 and impact on 2023 baseline.
	Detailed commentary on 2024 actions that have led to improvement of configuration changes.
	Provide detailed update on work done on the inclusion of planned outages.
	Report on progress for extracting ERT measurements from other PR5 developments.
3. Establish Year 5 Target of 85% or adjusted based on previous outturn	Report on non-storm ERT accuracy for <15min, <1hr and >1hr.
	Report on storm ERT <4hr and <24hr.
	Provide sufficient evidence outlining the reasons why new targets were chosen.
	Provide sufficient evidence how the targets will be achieved, e.g. through data processes. If necessary, provide evidence showing why targets were not met.

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1   CRU 202405 Price Review Five: 2024 Balanced Scorecards Distribution and Transmission Information Paper. Available at www.cru.ie

Specifically, in 2024 ESB Networks has:

- Completed the data analysis for the 2024 ERT fault outage data, identifying the difference between Storm/Non-Storm ERT accuracy as well as differences between Weekend/Weekday ERT accuracy and Daytime/Nighttime ERT accuracy.

- Completed the data assurance checks on the 2024 fault outage data and documented the outcomes of these checks. Reviewed and verified randomly selected customer outages, verifying that all outages were correctly recorded and reported.

- Identified the lessons learnt from 2023 and issued a public consultation on the ERT Incentive to ESB Networks stakeholders and customers.

- Expanded the ERT pilot to include nine additional areas and determined the new ERTs for the Device Types in the selected areas. This brought the total number of areas in the ERT pilot to 25. The type of device the Outage Management System initially determines the outage to be on i.e. Busbar, Transformer etc.

- Completed the data analysis for the 2024 ERT planned outage data and reported the results of this analysis.

- Developed and tested a new storm process suspending ERT's and informing customers during a storm, via the Powercheck.ie website, that ESB Networks will assess the damage when safe to do so and will revert shortly with an ERT. This was successfully deployed for the first time during Storm Eowyn in January 2025.

- Completed the data analysis and reported on 2024 ERT accuracy for Non-Storm Day ERT >1hr and <15mins and Storm Day ERT <24hr and <4hr.

- Detailed evidence how the ERT accuracy targets for 2025 targets will be achieved.

In September 2023, ESB Networks submitted the ERT Accuracy Incentive Multi-Year Plan (2024 – 2028) to the CRU. This document proposed the below ERT accuracy targets for both Non-Storm Days and Storm Days. These targets were accepted by the CRU and are detailed in Section 5 of the Price Review Five 2024 Balanced Scorecards Distribution and Transmission Information Paper, CRU 202405 published March 2024. The tables below details the CRU's ERT accuracy targets for both Non-Storm Days and Storm Days.

Agreed ERT Accuracy Targets for Non-Storm Days

Accuracy of estimates	2022 (baseline) *	2023	2024	2025
% Customers restored within 1 hr (+/-) of initial ERT – Non-Storm Days	29.7%	35.2%	40.7%	50.1%

Agreed ERT Accuracy Targets for Storm Days

Accuracy of estimates	2022 (baseline) *	2023	2024
% Customers restored within 4 hours of the initial ERT – Storm	50%	55.0%	55.0%
% Customers restored within 24hr of the initial ERT – Storm	90%	75.0%	75.0%

In 2024, over 3.84 million Non-Storm Day customer outages were recorded. A detailed analysis of these outages concluded;

- The ERT accuracy for <15 minutes (+/-) increased by 6.3% from 9.3% in 2023 to 15.5% in 2024. This is a total of increase of 7.4% from the 2022 baseline figure of 8.1%. This increase was to be expected as the focus is on prioritising the ERT accuracy within 1 hour (+/-) to provide more accurate timings for a larger percentage population of customer outages.

- The ERT accuracy for the percentage of customers restored within 1 hour (+/-) of initial ERT was 50.2%, this exceeded the 2024 target by 10.1%. The baseline figure in 2022 for the percentage of customers restored within 1 hour (+/-) of initial ERT was 29.7%. This figure increased to 37.6% in 2023 and 50.2% in 2024.

- In achieving the ERT accuracy for the percentage of customers restored within 1 hour of initial ERT the ERT accuracy for >1 hour (+/-) decreased from 70.3% in 2022 to 49.8% in 2024. This is a positive result and is a direct consequence of increasing the ERT accuracy within one hour that is required under this incentive.

The ERT accuracy for Non-Storm Days as per the reporting measures specified by the CRU for the period 2019 – 2024 are detailed in the below graphical representation of the ERT restore time variance for Non-Storm Days over the six-year period, 2019 to 2024.

Non-Storm Day Analysis Summary

Accuracy of estimates	2024	2023	2022	2021	2020	2019
ERT accurate to within 15 mins (+/-)	15.5%	9.2%	8.1%	7.7%	6.6%	4.9%
ERT accurate to within 1 hour (+/-)	50.2%	37.6%	29.7%	28.9%	28.6%	25.6%
ERT accurate to > 1 hour	49.8%	62.4%	70.3%	71.1%	71.4%	74.4%
% of customers to whom no ERT given	2.2%	1.6%	0.4%	0.9%	1.2%	0.4%
% of customers who received ERT within 15 mins	84.0%	85.7%	87.2%	86.2%	86.7%	88.2%

Percentage of Customers Outages by ERT Restore Time Variance Non-Storm Day
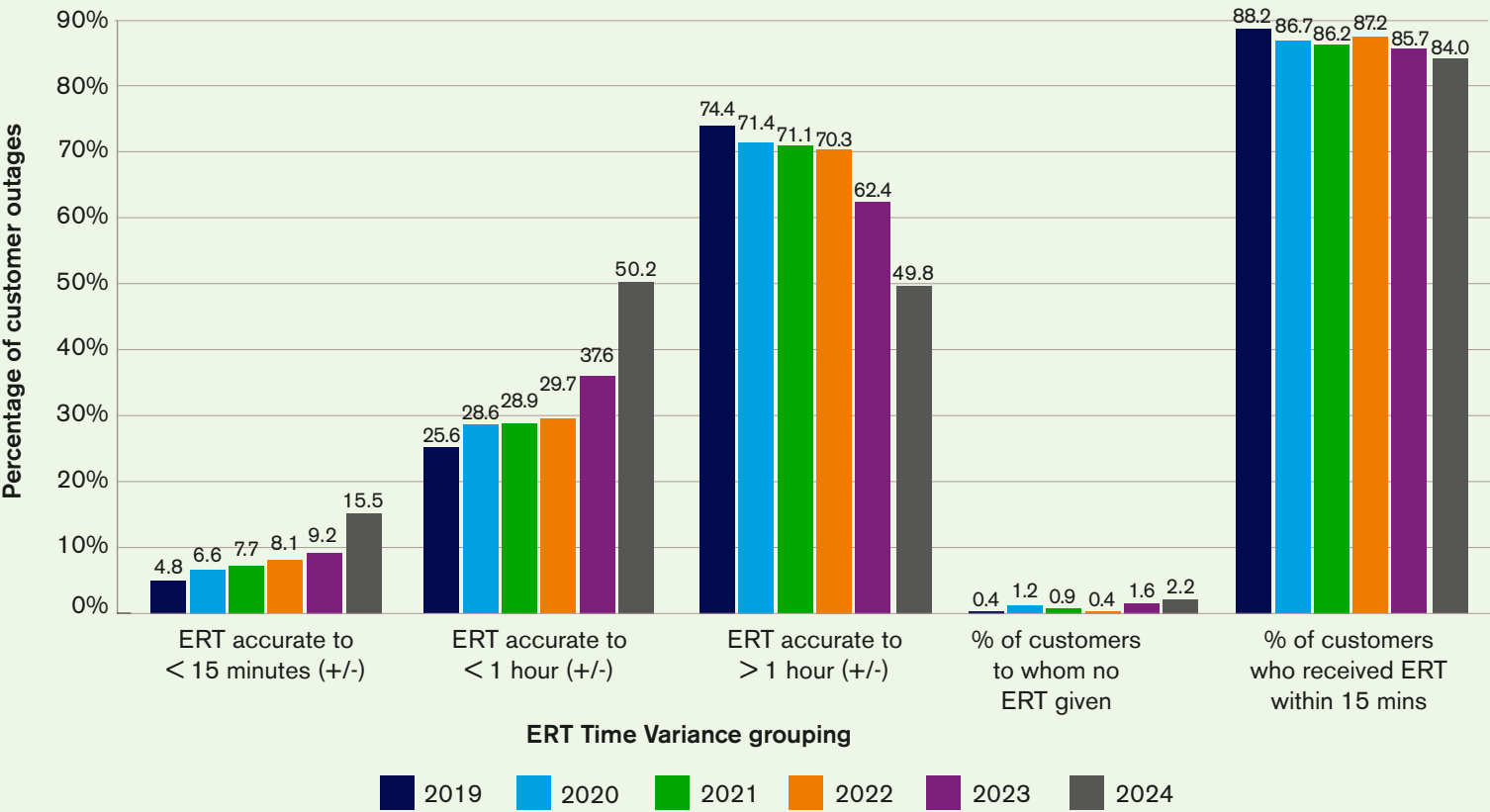
Over 1. 4 million Storm Day customer outages were recorded in 2024. From the analysis of the 2024 outage datasets, the following was determined:

- Percentage of customers restored within 4 hours of the initial ERT was 48.0% this was below the 2024 target by 2.0%; and
- Percentage of customers restored within 24 hours of the initial ERT was 90.9%, this exceeded the 2024 target by 15.9%.
- The table below details the ERT accuracy results for Storm Days for 2024 against the measures stipulated by the CRU.

Storm Day Analysis Summary

Accuracy of Estimates	2022 (Baseline)	2023	2024
% Customers restored < 4 hours of the initial ERT – Storm	50%	75.9%	48.0%
% Customers restored < 24hr of the initial ERT – Storm	90%	97.8%	90.9%
% Customers restored > 24 hours of the initial ERT – Storm	-	2.2%	9.1%
No ERT Issued	-	1.6%	1.95%

In 2024, ESB Networks extended the ERT pilot that was rolled out in 2022 and 2023 to include nine additional areas. This brought the total number of areas in the ERT Pilot to 25. Having performed a detailed analysis of the 2024 outage datasets from the extended ERT pilot it was determined that the 2024 ERT accuracy targets for Non-Storm days were exceeded. When the ERT accuracy figures for the Pilot and Non-Pilot areas were compared it was concluded that:

- There was an increase in the ERT accuracy for customers within 15 minutes (+/-) of the initial ERT for six out of eight Device Types. For one of the Device Types, MV Recloser SCADA, there was no difference between the Pilot and Non-pilot area, both had a value of 1%. For the remaining Device Type, SP PM Transformer, the Non-Pilot area performed better.
- There was a significant increase in the ERT accuracy for customers within 1 hour (+/-) for six of the eight Device Types. For one of the Device Types, MV Cct Breaker Urban SCA, there was no difference between the Pilot and Non-pilot area, both had a value of 73%. For the remaining Device Type, SP PM Transformer, the Non-Pilot area performed better.
- The improvement in the ERT accuracy for customers within 15 minutes (+/-) and within 1 hour (+/-) of the initial has resulted in the ERT accuracy > 1 hour reducing. This is a positive outcome as the goal of this incentive is to improve the ERT accuracy within 1 hour (+/-) of the initial ERT.

2 Reliability and Resilience

2. Reliability and Resilience

Continuity

ESB Networks' strategy is aligned to government policy and climate action objectives in actively promoting the transition to a low carbon economy, by supporting our customers in increasingly electrified systems of heating and transport. This transition will require an ever more reliable electricity system, as homes and businesses become dependent on electricity as their main source of energy. ESB Networks needs to be able to mitigate the impact of climate change on our infrastructure, whilst providing a safer, more reliable and resilient network for all electricity customers.

ESB Networks has put in place an extensive programme of work to reduce the number and duration of unplanned power outages and improve overall network performance. The focus of the PR5 continuity investment programmes is to minimise the impact of unplanned outages through network automation, impact of wildlife activity and invasive species and prioritised investments for Worst Served Customers (WSC). These investment programmes aid better flexible operation of the system in times of unplanned outages, so that customers experience minimised disruption. While the benefit has not yet translated into improvements in fault related customer minutes lost, we are confident that the right investment approach is being implemented to sustain and improve network performance.
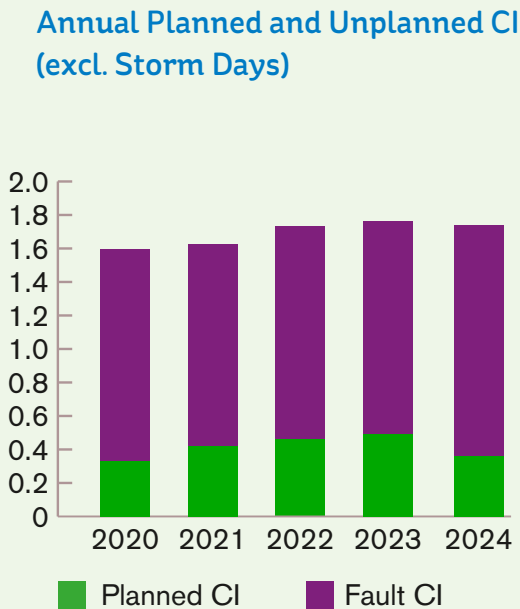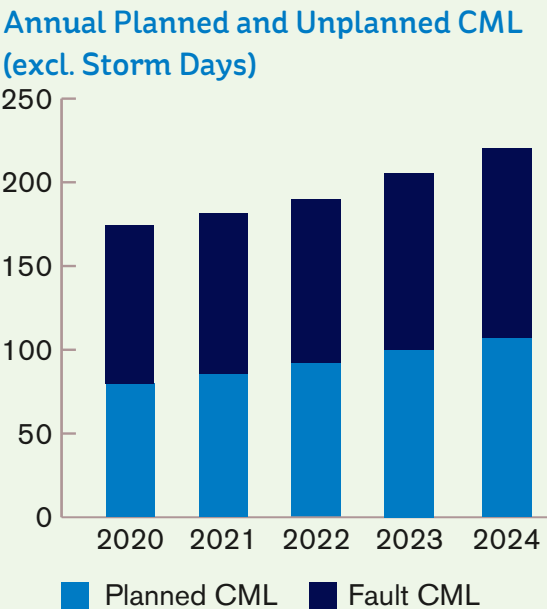
Furthermore, as part of PR6 (2026-2030), to enhance continuity of supply and improve the reliability and resilience of the network, we plan to implement further targeted continuity measures with robust asset management and climate adaptability programmes to improve overall network performance. We believe that this will reduce unplanned outages, minimise the risk of equipment failure over time, and enable the network to adapt to more extreme weather events in the future.

Outage Performance

Customer Interruptions (CI) represent the number of interruptions greater than three minutes that an electricity customer has on average each year. Customer Minutes Lost (CML) is the average duration that customers spend without supply each year. To benchmark our outage performance against other utilities 'storm days' (the effects of severe weather) are removed for unplanned CI and CML reporting. Therefore, the analysis in this section excludes storm day outages. In summary, in 2024:

- **There was an increase in unplanned CMLs year on year from 105 in 2023 to 117 in 2024. ESB Networks is continuing to work to improve the reliability of the network for customers. With increased storm activity, an aging network, increased network demand, and impacts from forestry / timber, there has been a dis-improvement in overall average network performance, which is measured by CMLs. We are continuing to ramp up investment to improve network reliability and a step change in investment has been set out in our PR6 Business Plan.**

- **Planned outages remain similar to previous years, reflecting the increased volume of work planned on the network, as we continue to invest and also to connect new customers.**

- **In 2024, the average electricity customer experienced an outage or Customer Interruption exceeding three minutes approximately 1.75 times per customer.**

- **When including both planned CML and unplanned CML, the average customer was without power for 219 minutes in 2024.**

The charts below outline the combined Planned and Unplanned CML as well as the combined Planned and Unplanned CIs.

Annual Planned and Unplanned CML (excl. Storm Days)

Legend: Planned CML, Fault CML

Annual Planned and Unplanned CI (excl. Storm Days)

Legend: Planned CI, Fault CI

Most of our customers are connected to the Low Voltage network, where faults are more frequent but usually affect a small number of customers at a given time. In contrast, High Voltage faults are less common due to the system's built-in resilience and redundancy. However, when they do occur, they have a much larger impact, affecting many customers and significantly influencing CI and CML metrics.

In the charts below we outline the:

- **Total number of planned and unplanned outages**
- **Outages split by voltage level**

Total Number of Outages

Legend: Planned, Fault

Total Number of Outages by Voltage

Legend: LV, 10kV, 20kV, 38kV/110kV
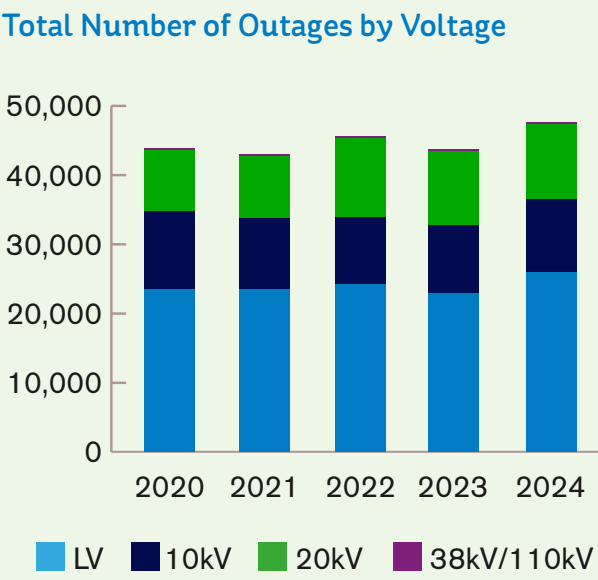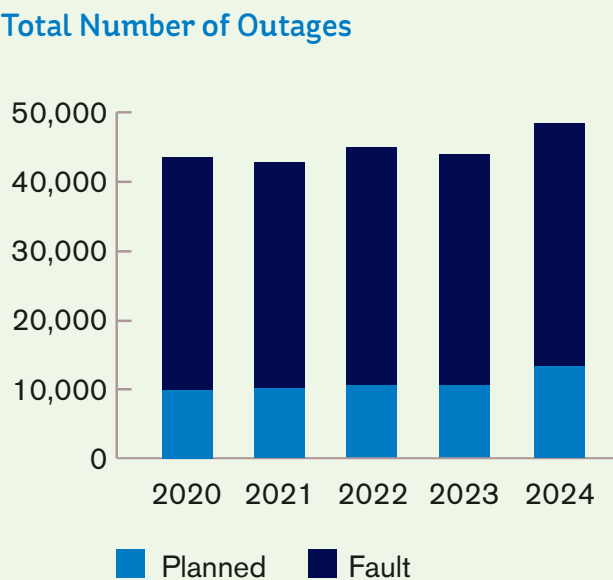
Unplanned Outage Performance

The CRU sets incentivised targets for unplanned CML and CI (which exclude storm related outages). We compare these targets to actual data for 2020 to 2024 in the charts below. In 2024, these targets were set at 78.7 CML and 112.7 CI. Our performance against these unplanned outage targets stood at 117.47 CML and 137.86 CI for 2024.

Unplanned outages are an unavoidable aspect of our network. The Irish electricity system has a high proportion of exposed overhead infrastructure compared to underground networks, largely due to the dispersed rural population -resulting in a 6:1 ratio of overhead to underground lines. In contrast, European utilities generally have a much lower ratio, typically below 2:1. Reliability challenges associated with overhead networks include climate and environmental factors, third-party interference, and low-grounded conductors.

Unplanned CI vs. CRU target
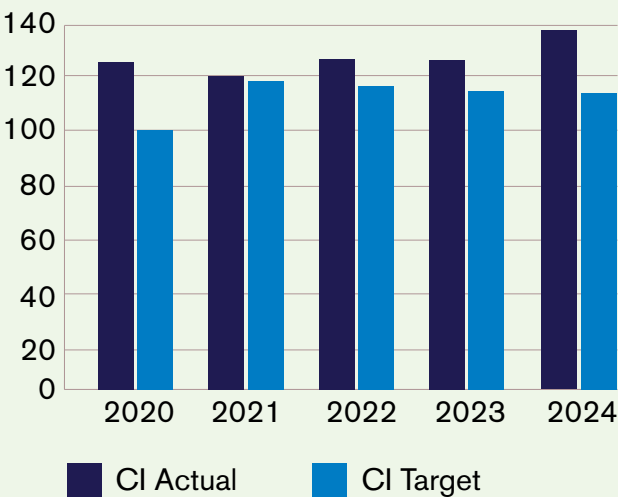
Unplanned CML vs. CRU target
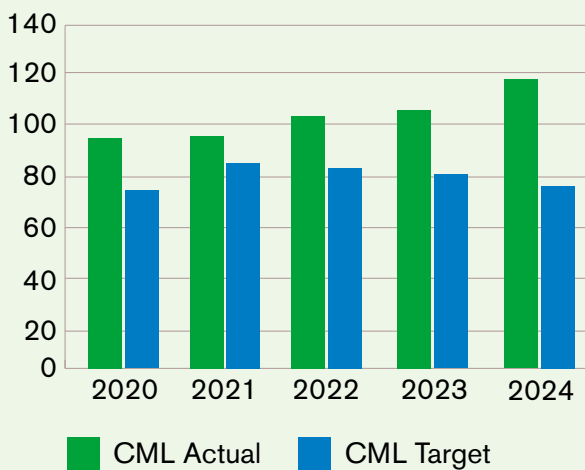
Factors impacting 2024 Continuity Performance

ESB Networks manages a network spanning approximately 180,000 km, comprising a substantial asset base and a wide variety of devices from multiple manufacturers, each with distinct maintenance requirements and at varying stages in their lifecycle. To effectively address maintenance needs and ensure network resilience, it is essential to optimise work programmes, allocate resources efficiently, ensure the availability of appropriate materials, and design strategies to minimise outages.

Storms significantly disrupt programmed work on the electricity network (this was a major issue in 2024) as they create a need to prioritise urgent repairs and unplanned maintenance. Following a storm, resources are often diverted to address immediate faults caused by damage to infrastructure, such as downed power lines or damaged transformers. This reactive work extends beyond visible storm damage, as follow on issues - such as weakened equipment often emerge in the days and weeks afterward. As a result, scheduled projects, upgrades, and planned maintenance are delayed to ensure the network's stability and safety, impacting the timeline of long-term infrastructure improvements. These delays highlight the compounding challenges storms bring to managing and maintaining the electricity network.

In 2024, the issue of wildlife coming in contact and/or causing issues on the electricity network is still a major issue. Birds and small climbing animals often cause flashovers between uninsulated parts at different voltage levels, while large livestock rubbing against stays or poles occasionally resulted in faults due to conductor sagging, clashing, and short-circuiting. Although these faults were generally transient, some led to more persistent issues requiring debris removal or intervention.

Insulation standards for coastal networks have been progressively increased to address the impact of air-borne salt from onshore winds, which has affected some areas. Recent network installations are constructed to higher specifications, and a refurbishment programme is in place to upgrade older infrastructure to this level.

Measures being taken to improve continuity performance

ESB Networks has awarded a new Timber & Vegetation Management framework that has secured timber cutting contractors of scale to manage our vegetation programme over the next 8 years – this framework came into operation on the 1st of January 2025. Significant increases in resources have already been achieved since it was put into operation and currently we have increased cutting capacity by 25% with plans to further increase this capacity in a safe and sustainable manner. Our Framework Contractors are actively recruiting resources and are working closely with Galway Roscommon Educational Training Board to develop resources in this niche industry.

ESB Networks and our contract partners are working with the Education and Training Boards with plans to seek the further expansion of this training to other locations in Ireland to meet resource demand across the country. In addition to expanding the number of timber cutting operators while enhancing the skills of current timber cutting professionals, contractors are also investing to increase delivery of work through further utilisation of mechanisation for cutting operations where practicable . ESB Networks are also utilising digital technology and data with the deployment of an online timber management application to streamline efficient delivery and management of our timber cutting operations.

Restructuring of the Delivery Organisation has taken place to optimise resources, enhance work planning, and the establishment of a National Programme Delivery framework for efficient contractor-led maintenance. Recruitment of additional personnel and expanded training have also been prioritised. Digital advancements, such as a Continuity Dashboard and greater use of data analytics to support informed maintenance and replacement decisions. Programmes have been redesigned to include the integration of regional continuity plans into the National Work Programme 2024 and initiatives like the Asset Replacement Maintenance Order (ARMO) Programme, which streamlined asset replacement and maintenance priorities.

A nationwide trial is currently underway looking at the use of shrouding within stations to avoid animals/birds coming in contact with busbar etc. which could impact approx. 5,000 customers at a typical 38kV station. In 2024 three stations had shrouding applied and twenty installations are planned for substations in 2025.

Other key initiatives listed below are ongoing and remain central to addressing network resilience and minimising wildlife and livestock-related faults. The steps include:

- Strengthening the accuracy of fault recording, enabling ESB Networks to devise durable, data-driven solutions.
- Continuity patrolling to identify recurring wildlife or livestock issues and applying countermeasures like pole piping, fencing, boxing off poles (fence around poles to prevent livestock access), installing game guards, and widening span clearance.
- Significantly increasing the installation of single-phase reclosers on MV spurs in 2024, which will help reduce CML and CI metrics linked to conductor clashes, timber impacts, and wildlife strikes.
- Adopting updated standards to include pre-fitted bird guards on new pole-mounted transformers.
- Strategically positioning insulated conductors and wider cross arms to lower bird-related faults on MV overhead lines.
- Installing bird diverters at HV stations with a history of repeated bird-related issues.

Increasing the use of game guards on river crossings and other areas prone to bird strikes on overhead lines.

The deployment of Automated Protection Devices (3 Phase and Single Phase) saw a substantial increase in 2024, marking notable progress. A total of 174 three-phase units were installed, nearly tripling the volume delivered in 2023. Additionally, 194 single-phase spurs were equipped with Fusesaver or Tripsaver devices - a significant rise compared to the 65 installations in the previous year.

This accelerated rollout represents a significant increase on the level of mitigations delivered in comparison to previous years. However, the scale remains insufficient to produce a tangible, nationwide impact on Customer Minutes Lost (CML) and Customer Interruptions (CI). The scale of delivery during 2024 will continue throughout 2025 and further into PR6, as more resources become available or are upskilled, the level of delivery should also increase.

The process for work programme planning and assignment was streamlined in 2023, which further optimises the prioritisation of targeted works to improve the impact of unplanned outages and the continued delivery of wider work programmes for immediate and long-term benefits. This is augmented by continued delivery of the overall ESB Networks' work programme.

Process improvements are ongoing to improve how potential low or grounded conductors / contact with conductors (LGC's[1] /CWC's[2]) are managed to reduce the volume and their impact on network continuity. Training programs for call centre staff, dispatch staff and control room operators which are designed to improve interpretation of information received on CWC/ LGC calls were rolled out in early 2023. This has seen a decrease in the level of interruptions experienced by our customers due to the implementation of our CWC/LGC protocol.

1 *LGC refers to a report of Low Ground Conductor from a member of the public.*
2 *CWC refers to report of Contact with Conductor by member of the public.*

Network Automation

There are various types of automation on the network used for protection and operations. Automated switching and protection devices known as 'reclosers' reduce the impact of transient faults on the MV overhead network and enable smart grid options. We are implementing the following PR5 automation programmes to improve network reliability and resilience:

Three Phase Reclosers

These devices reduce the impact of transient faults on the MV overhead network and enable Smart Grid options. SCADA (Supervisory Control and Data Acquisition) automated reclosers assist when fault hunting as they provide relay grade diagnostics and fault passage information to control room operators. They can be used as part of self-healing schemes or also as remotely operated sectionalising points for manual operation from the control room.
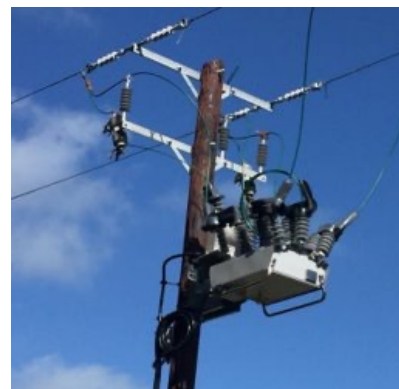
Three Phase Recloser

Single Phase Reclosers

Single phase reclosers replace spur fuses. These devices benefit customers on long spurs to limit momentary reclosing interruptions to the customers supplied from that spur (60 to 200 customers typically) e.g., only the faulted spur customers experience momentary interruptions as opposed to customers on the entire feeder (typically 1,000 customers) as per advances in the available functionality of the technology. This solution provides an enhanced customer experience as it minimises the number of customers impacted by transient overhead faults, which account for more than 80% of all faults. This programme is aimed at single phase spurs greater than 10km in length and with more than 20 transformers.

Single Phase Recloser

38kV Primary Substation Automation

At 38kV when there is a line fault, on average at least 5,000 customers are impacted. The majority of 38kV outlets have circuit breakers, Automatic Changeover of Stations (ACO) and Automatic Open (OP) or Automatic Closing (CL) of breakers can be achieved by installing voltage sensing relays on these existing circuit breakers. This solution will provide for automatic supply restoration to suitable 38kV stations thus improving reliability for customers.

Voltage Regulator Automation

Many voltage regulators are in remote locations on low population density rural outlets. By adding SCADA (Supervisory Control and Data Acquisition) control to these voltage regulators, the device can be remotely operated from the NDCC. This reduces outage durations and prevents spurious protection outages on long dispersed outlets during switching.

Remotely Controlled 38kV Switch

The automated device can be opened and closed remotely from the National Distribution Control Centre, from where we monitor and control the network 24/7, in exposed locations with long circuit lengths. For example in rural peninsulas, 38kV manual switches will be replaced with remotely controlled 38kV switches for more efficient fault isolation and supply restoration.

MV Urban Switch Automation

Urban MV switch automation is required to be able to quickly identify MV cable faults to minimise disruption to businesses and other critical supplies such as hospitals and urban customers. It will also provide fault location information to operators. Targeted remote control of ring main switches will be provided on the urban network with relay grade fault passage information.

38kv remotely controlled switch

MV urban switch automation

Worst Served Customers

The CRU defines the objective of the WSC incentive mechanism as improving outcomes for those households and businesses who would otherwise have a sustained and materially lower standard of supply reliability. It reflects a desire to introduce a greater degree of social fairness into the outcomes that would otherwise prevail if investments to improve supply reliability were chosen based on narrow economic cost-benefit alone, across all sectors of society.

The WSC work that was completed in 2021 and 2022, resulted in 13,569 customers meeting the incentive success criteria in 2023. In 2024 ESB Networks continues to meet incentive success criteria. The full penalty will only apply (if there is underperformance) at the end of the PR5 period, e.g., end of 2025. In 2024, 11,360 of these customers meet the incentive success criteria.

An important aspect of the WSC programme (and the associated incentive), is the requirement to confirm the effectiveness of the interventions in relation to improving resilience and reliability. The performance assessment takes place one year after completion of the works. This incentive rewards ESB Networks for prioritising the interventions that have maximum impact on reliability and resilience, thus improving customer service.

A WSC is a customer that is supplied from rural overhead networks who experiences more than or equal to:

• **five interruptions in the previous 12-month period; and**
• **15 interruptions in the previous 3 years.**

WSC performance is influenced by wind and lightning weather events, as it is based on the number of CIs per customer. This includes multiple CIs that can occur on storm days. The chart below shows that on average from 2020 to 2024 there were 60,000 WSCs on storm days, due to an increased volume of outages. The data also shows that when the volume of storm days per annum is low, that WSC performance improves, for example in 2021.

WSC Population Trend

WSC Including Storm Days & Non-Storm Days

WSC on Storm Days

Linear (WSC Including Storm Days & Non-Storm Days)

Linear (WSC on Storm Days)
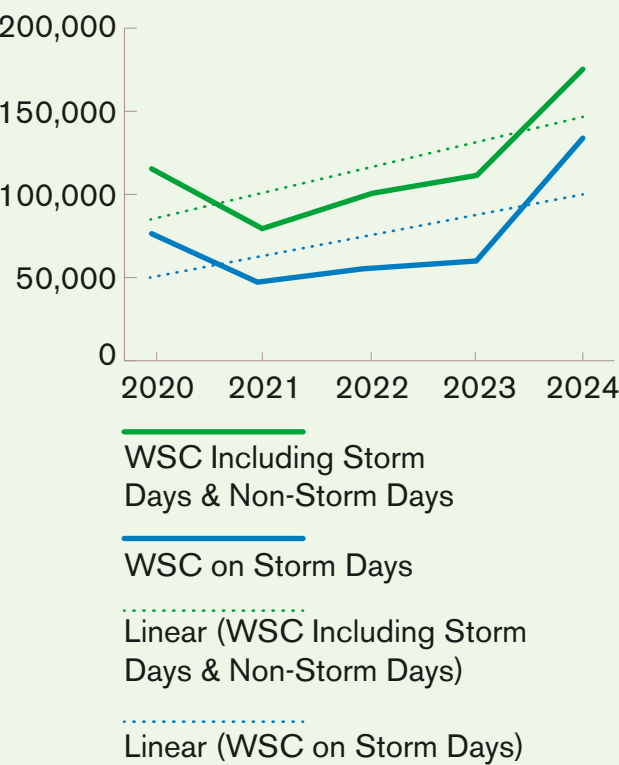
Declared Storm Days per Year
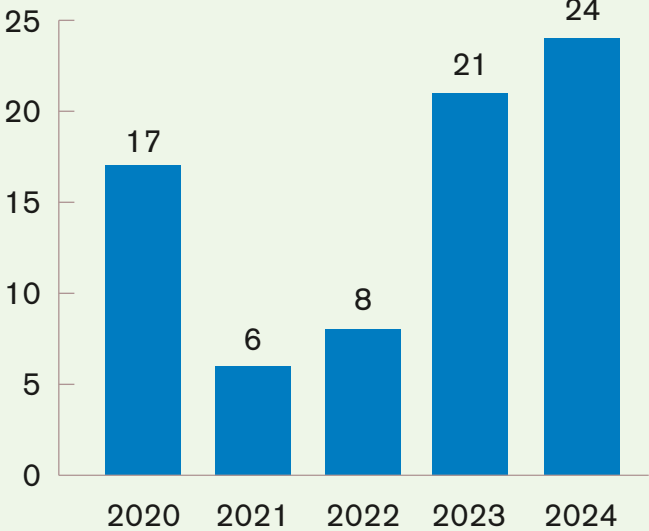
In PR5 we are implementing an enhanced WSC investment programme to reduce the volume of outages these customers experience, as outlined in the table below.

WSC Interventions Summary

Intervention	Benefits
Single phase to three phase conversions	Less customers impacted by faults
Phase balancing	Prevents spurious tripping during switching and sectionalising for faults or planned work
Lightning arrestor installation	Reduces the impact of lightning in rocky, mountain locations and coastal locations prone to frequent lightning storms
Bird mitigation	Bird guards installed to prevent outages caused by bird strikes and swan deaths
Voltage regulator and IFT site automation	Installed in remote locations with worst served customers to prevent spurious outages during fault switching
Reducing span lengths, wider crossarms	Prevents nuisance frequent transient outages due to wires clashing together
WSC patrolling	Patrols to identify WSC interventions were completed

Planned Outage Performance

Every year ESB Networks must carry out scheduled works such as planned work programmes and new connections, which result in planned outages to customers. The outage date and duration are notified to customers in advance. The charts below show the planned CML and CI per 100 customers from 2020 to 2024. The figures are increasing over time due to increased outages on the network due to the implementation of the work programmes in preparation for electrification and the transition to a low carbon economy. For example, in 2024 there was 37,565 new connections and 325,786 smart meters were installed.

Planned CML per Customer

Year	Value
2020	79.77
2021	85.83
2022	93.09
2023	101.51
2024	101.7
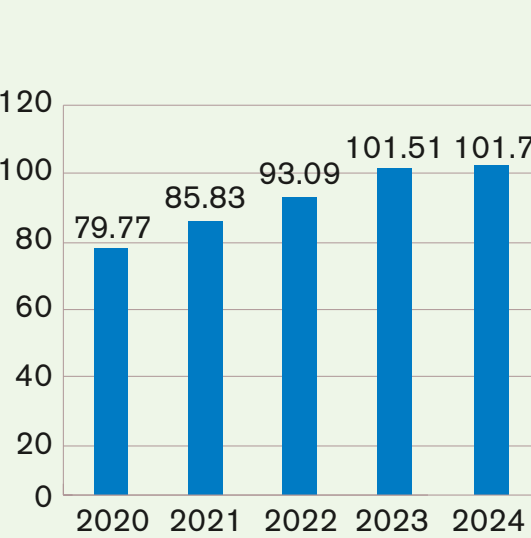
Planned CI per 100 Customers

Year	Value
2020	33.56
2021	42.10
2022	46.82
2023	50.25
2024	37.02
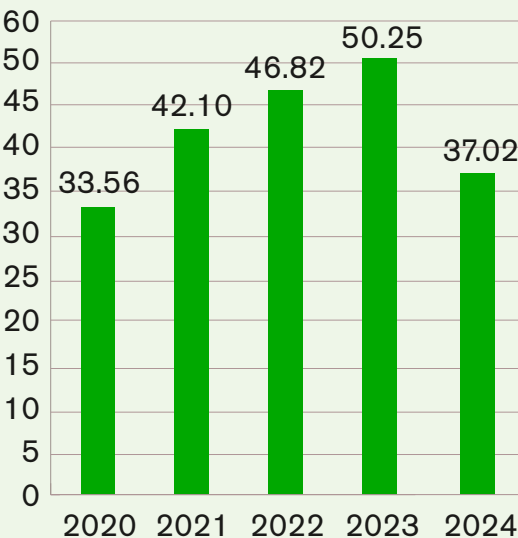
Resilient Network

ESB Networks' Resilient Network Strategy is underpinned by our advanced asset management approach. We continue to innovate and adapt our assets to constantly improve our network performance and deliver a network which:

• **adapts to mitigate against the risk of climate change;**

• **provides a safer, more reliable and resilient network for our customers; and**

• **has the capacity to enable the transition to a clean electric future.**

ESB Networks' ISO 55001 accredited end to end asset management approach, manages our assets in a consistent way using risk and data insights to inform decisions, define interventions and deliver targeted works. This includes the prioritised delivery of network investments to maintain the health of our assets through targeted maintenance and asset replacement programmes.

Climate Adaptation

ESB Networks' Price Review 6 Business Plan, issued November 2024, includes specific measures to increase the resilience of the network in the face of climate change and enhance climate adaptability. This identifies ESB Networks continuing focus on climate adaptation and addresses one of the three key strategic objectives in our Networks for Net Zero Strategy of delivering resilient infrastructure, including:

Evolution of our Climate Adaptability framework, which, as provided also in the 2023 report, has the following focus areas:

• **climate adaptation policy and best practice alignment;**

• **ensuring a consistent risk management process; and**

• **planning and implementing climate risk control measures.**

1. Climate Adaptation Policy and Best Practice Alignment

ESB Networks appreciate its obligations to address Irish and EU legislation, directives, and regulations. In 2024, ESB Networks has continued engagement with national organisations, including:

- Our engagement with the Department of Climate, Energy and Environment (DCEE) continues including responses to the draft National Adaptation Framework in May 2024 and addressing the Climate Change Advisory Group's 2024 Questionnaire for the Climate Change Adaptation Plan for Electricity and Gas. In addition, ESB Networks will be contributing to the revision and implementation of the Electricity & Gas Networks Sector Climate Change Adaptation Plan in 2025.

- ESB Networks continue to engage with Met Eireann, the National Framework for Climate Services, the Environmental Protection Agency (EPA), Climate Ireland Adaptation Network , DCEE, and Office of Public Works (OPW) attending in 2024 various climate change adaptation workshops and seminars.

- ESB Networks continued in 2024 to explore climate risks with the wider utility community on climate adaption experience and learnings from other jurisdictions. In 2024, we maintained engagement and partnership with expert international groups, taking part in long-term climate change research and its impact on electricity infrastructure.

- As members of a European distribution network operators climate adaption working group supported the development of the position paper on climate resilience metrics for electricity grids[1]

- As members of UK Energy Networks Association Climate Change Resilience Working Group supporting the development of draft climate resilience stress testing parameters and climate change resilience metrics and indicators.

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1 *Position Paper Climate Resilience Metrics for Electricity Grids*

2. ESB Networks' Risk Management Process

Our risk management process tracks emerging and existing risks to ensure we have appropriate mitigation to manage all risks. We review and report our risks and the appropriate mitigation on a quarterly basis. We identify key risk indicators and ensure that any new risks are appropriately identified and that relevant actions are in place to manage them.

Increased the use of asset data and digital technology to gather, analyse, and make available data, facilitating work, and resource planning across ESB Networks' business units, has allowed ESB Networks to identify and address climate risks, such as:

- Leveraging a digital twin platform, NEARA, identifying a pilot assessment focusing on the Low Voltage and Medium Voltage network. This pilot explores the transformative potential of digital twin technology across various use cases, including optimising vegetation management and assessing network resilience by evaluating overhead network performance under storm conditions and identifying immediate risks like leaning poles or inadequate clearance. For more information see the ESB Networks Innovation Report.

- Weather analysis and forecasting tools to assess historical and future vulnerable locations with the objective to optimise design of the network and work programmes.

- 'Unmanned Aerial Vehicle Framework' for inspecting overhead lines, which includes the potential use cases of vegetation management, line patrols following storms and the identification and location of intermittent faults on the electricity network.

- Utilising the OPW, CFRAM (Catchment Flood Risk Assessment and Management) tool ESB Networks assess potential site acquisitions for HV substations and have assessed existing HV substations against current and future flooding scenarios. It has identified that the 2024 National Climate Change Risk Assessment (NCCRA) Methodology has aligned the NCCRA climate projections and OPW Risk Ratings. ESB Networks has begun engagement with 2024 NCCRA Methodology developers to identify how ongoing work to align National Climate Change Risk Assessment (NCCRA) climate projections and OPW Risk Ratings may impact ESB Networks' flood risk assessments methodologies.

3. Planning and Implementing Climate Risk Control Measures

ESB Networks experienced a record-breaking 24 storm days in 2024, surpassing the previous record of 21 storm days. The storms caused large scale damage to the electricity network, affecting a large number of customers. In particular Isha and Jocelyn, occurring within two days of each other, and Darragh, were extreme weather events requiring responses far above and beyond those required for lesser storm events. ESB Networks mobilised all available resources to restore supply as quickly and safely as possible, while also maintaining extensive communication with customers, particularly vulnerable ones.

- ESB Networks' Business Plan for PR6, submitted in November 2024, proposes a significant increase in investment in network resilience which will help to address climate change impacts including storms.
- Following the significant storms in 2024 and Storm Éowyn in 2025, ESB Networks was tasked with further developing its storm readiness by producing an Enhanced Winter 2025 Grid Resilience Plan. The plan will be implemented between March and October of 2025 with the objectives to enhance the resilience of the grid in the most vulnerable locations for the upcoming winter.
- Proactive, accurate power outage information was previously identified as a critical area for improvement. The PowerCheck website is a key tool in this regard, which saw 4,148,251 unique visitors, with 13,455,921 pageviews.

ESB Networks identified the following automation programmes to improve network reliability and resilience for 2024 and 2025:

- 38 kV Primary Substation Automation
- Voltage Regulator Automation
- Remotely Controlled 38 kV Switch
- MV Urban Switch Automation

ESB Networks' Investment Plan Approach for Price Review 6 includes specific measures and initiatives in our PR6 Business Plan to increase the resilience of the network in the face of climate change and enhance climate adaptability.

Development of Asset Health Indices

Resilience network programmes are work plans that are delivered to support and ensure that the network is more resilient for the future. Asset replacement programmes are currently planned for PR6 and these have been developed with the support of Common Network Asset Indices Methodology (CNAIM) asset health indices. This helps us to target the most unhealthy assets and plan timely replacement programmes to ensure the network performs as required.

ESB Networks committed to developing a data driven approach to asset management and has developed asset health indices for its DSO assets during PR5 (2021-2025). To ensure best practice, the asset health index models were developed using a CNAIM ensuring alignment with other DSOs internationally, in particular those in the UK.

Twenty one CNAIM baseline asset health models are now delivered and have been used in the PR6 submission to support our decisions to invest in asset replacements and to ensure network risk is reduced therefore giving a resilient network into the future. These models will support informed asset replacement investment decisions and allow us to target unhealthy assets to ensure we improve overall network performance and reduce network risk. Across the remainder of PR5 and into PR6 we will evolve our approach to asset health and improve the data inputs to maximise the value of asset health model outcomes in supporting ESB Networks to replace assets at the most appropriate time in the asset lifecycle and deliver a more reliable and resilient network for electricity customers.

Maintaining our Assets

HV Substations

The distribution system includes 566 HV substations. To provide the best service to all of our customers, each substation's reliability is of utmost importance. Strategic maintenance and replacement before deterioration or failure is key to providing uninterrupted supply to our customers, ensuring the integrity of the assets and safety for our staff and the public.

To allow effective delivery of the above programmes, there has been a particular focus on batching work during programming and execution. We have introduced a more integrated maintenance and asset replacement annual plan using our core enterprise tools and analytics to identify batching opportunities. This approach results in a range of different programmes being executed at the same time in a HV substation. This approach looks to maximise the level of work delivered, through an efficient use of resources and make maximum use of network outages. This approach was rolled out in 2022, with scaled delivery occurring in 2023 to meet the wider strategic objectives of improving resilience, capacity and operational flexibility. Additional contractor delivered maintenance has increased maintenance completions in 2023 and through 2024.

In line with our PR5 submission focus on asset health and making data-driven decisions, there was a continued focus in 2024 on acquiring additional condition-based data for our assets. This included additional oil sampling programme on 38kV transformers which has identified at risk transformers which have been taken out of service and refurbished / replaced in advance of failure and associated impact on customers and provides more current condition information to inform asset health indices. An annual risk ranked programme has been agreed with focus on continuity improvement and key PR5 asset replacement programmes.

In addition to our high-volume maintenance and asset replacement programmes above, major asset replacement projects are also progressing. This involves the replacement of sections of or entire 38 kV stations, typically deploying modular (containerised) solutions that allow for standardised 38 kV, MV and control room solutions. These modules allow for faster, more consistent project delivery and commissioning timelines. Removal of older legacy stations mitigates key safety and continuity issues associated with older, fault-prone legacy equipment as indoor stations have lower exposure to wildlife and lightning strikes and other climate impacts. A number of new distribution stations were energised in 2024 and end of life stations have been retired in 2024.

The number of HV substation asset replacement, routine maintenance and outage maintenance programmes completed from 2021 to 2024 are outlined in the table below. There has been an increase in delivery of asset replacement, routine maintenance and outage maintenance in 2024 relative to 2023.

Units completed	2021	2022	2023	2024
Asset replacement	368	280	361	441
Routine maintenance (incl. inspections)	11,694	11,085	13,379	13,676
Outage maintenance	900	1,218	1,568	1,752

Overhead Network

The overhead distribution electrical infrastructure in Ireland is made up of approximately 63,000 km of LV network, 85,000 km of MV network and 6,000 km of HV (38kV – 110kV) network. The fundamental components of this infrastructure are support structures (poles or steel towers), conductors, insulators and electrical equipment for operational switching. The operating voltage will dictate the conductor and insulator type to be used and the support structures used are predominantly wooden poles.

Wooden poles account for over 98% of all overhead line support structures. Network technicians climb these poles to operate and maintain the system, so the strength or "health" of these poles and the material and equipment supported is of the upmost importance.

2024 saw the refinement of the asset models for overhead line assets. The asset health data models used in this project rely on data that fulfils technical requirements and skills required to analyse and present the results. Collaboration between digital mobile technology experts and overhead line specialists has ensured mobile apps will soon become available across all voltages. This will facilitate targeted mitigation, asset health scoring, recording of planned future network renewal works and overall it will help to improve our network resilience.

There was a continued focus in 2024 on delivery of safety and customer focused programmes. For example:

- **public safety hazard patrols and rectification of identified hazards across all voltages (improved digital processes allow for the identification and risk categorisation of any identified public safety hazard and facilitates clearance of highest risk first);**
- **continued delivery of the pole replacement programmes at MV and commencement at LV and targeted interventions on our worst performing outlets (WPO); and**
- **ongoing refurbishment of the 38kV overhead network.**

Network resilience in overhead lines is directly related to the delivery of the asset replacement and maintenance programmes. These programmes are targeted and integrated (where possible) based on asset condition and load data. Our databases are continually improving and in 2024, we improved (through targeted patrols) our MV and LV Urban and LV Rural asset data. This management system allows us identify problems and plan to remove the asset before it fails. This is positively impacting on network resilience.

Review of internal safety and fault monitoring databases resulted in targeted inspections on sections of overhead line, with a view to reducing the likelihood of conductor failure. Training programmes have been rolled out nationally for staff to test and record conductor condition. This is facilitating evidence-based conductor replacement.

Considerable progress has been made in the introduction of composite poles in 2024. Currently 3,500 of the 6,000 composite poles on order have been delivered. These polls will be installed across live LV, MV and 38kV network. ESB Networks has an approved company standard for the use of composite poles in order to support delivery and business as-usual installations. In addition, training is being rolled out to ensure crews can complete the work safely. Composite poles will provide improved resilience in areas exposed to harsh environmental conditions and in locations prone to woodpecker damage.

Timber cutting programmes have a significant impact on the resilience of our overhead network. Data driven programmes focused on safety and customer together with continued focus on increasing delivery resources and compliance to standard is having a positive effect on network resilience.

Our worst performing outlets and locations of known accelerated asset degradation have been prioritised for targeted specialist technical patrols and follow-up remedial works programmes. This ensures resources are targeted and deployed to the locations most in need of investment.

Wildlife protection for overhead networks was also reviewed in 2024, to minimise impact on wildlife and to improve network performance. Bird diverters on overhead conductors minimise outages and damage due to bird strikes and mitigation devices fitted to transformers also prevent customer outages.

Our focus will be on network resilience over the coming years. In particular we are focusing on the current future challenges defined in our Networks for Net Zero Strategy. This will have an impact on how we manage, maintain and plan for our future overhead networks.

Underground Network

There are approximately 187,000 LV minipillars on the distribution system. ESB Networks carries out public safety hazard patrols on approximately 46,250 minipillars per annum. We previously developed a new software application to capture minipillar data from such inspections. By the end of 2021, survey data for all registered minipillars was inputted into this system, meaning we now have full asset population patrol data. This enables ESB Networks to plan asset replacement and/or corrective maintenance on this significant asset base. This resulted in the movement from paper-based patrol records to being more digital and data-driven in the lifecycle management of our LV minipillars.

There are approximately 24,000 MV substations on the distribution system. ESB Networks also carries out public safety hazard patrols on approximately 11,500 MV substations per annum. It was identified during our PR5 submission that further MV substation inspections were required, to ensure the integrity of our substation structure and the MV and LV equipment inside. We now have a 10-year MV substation inspection programme in place. From 2022, we successfully rolled out an inspection patrol application, business support guidelines on processing corrective orders, network technician/patroller training and put in place the necessary framework for MV unit substation shell and door replacements (a corrective item arising regularly during the patrols).

On our MV network, we also continue to progress planned asset replacement programmes on our cast resin type MV unit substations. To replace these MV unit substations in urban environments is difficult, particularly where the space allowed for the existing substation is too small for our currently supplied standard MV unit substation. To ensure this important asset replacement programme progressed, ESB Networks secured several alternative MV unit substation types from our equipment suppliers. These slimline substation design types have been successfully deployed at sites where width, depth and height space can be limited. By the end of 2024, the cast resin type MV substation population was reduced down to approximately 815 units (from an original 4,500 units).

Metering Assets

Meter asset management sets the standard for meter installation, maintenance, and replacement of electricity meters across the residential and commercial network. ESB Networks owns and maintains almost 2.5 million customer meters. In 2024, 325,786 smart meters were installed as part of the smart meter programme.

ESB Networks also carried out the replacements of 165,968 day/night meters with smart meters. At the MV and HV levels, 176 and 44 meters were exchanged, respectively. Other key achievements in 2024 included the completion of 2,367 major meter tests and the installation of 1,511 'Pay as You Go' meters.

Network Reinforcement

Continued network reinforcement is of vital importance to the distribution system. ESB Networks has delivered and will continue to deliver large HV projects that facilitate economic growth, provide new connections and improve security of supply for customers.

The increase in 38 kV and 110 kV capacity each year from 2019 to 2024 is outlined in the table below. Important projects to improve resilience, increase capacity and strengthen the network were completed in 2024. Overall, capacity increased by 99 MVA, which consisted of the installation of:

- **four 110 kV transformers, which increased capacity by 73 MVA; and**
- **nine 38 kV transformers, which increased capacity by 26 MVA.**

Net Increase in 110 kV and 38 kV Transformer capacity

Year	2020	2021	2022	2023	2024
110 kV (MVA)	63.0	220.0	1.5	79.5	73
38.0 kV (MVA)	27.8	5.0	48.0	11.0	26

New Material Introduction

Traditionally ESB Networks has purchased most of our equipment and materials on medium term supplier frameworks. This has given us stability in the materials and equipment being installed on the electricity network and consistency for our construction and operation teams. To meet the required pace of expansion of our network and maintain service levels, ESB Networks now has a wider range of asset development and acquisition approaches. This includes:

- **contestability;**
- **engineering, procurement, and construction; and**
- **design and build frameworks.**

To expedite and manage the rapid introduction of new and innovative technologies safely and efficiently, we established a 'New Material Introduction' process. This brings new material for our electricity network from the research and investigation phase through to business as usual. The new process engages the key stakeholders at the correct time to expedite the introduction of materials new to us onto our electricity network.

Load Indices

ESB Networks committed to develop a load indices (LI) approach to manage and track changes in the peak loading at high-voltage (HV) substations and to help prioritise reinforcement activities for PR5.

LIs are a network output measure to indicate substation and network utilisation, to manage and track changes in the peak loading at HV substations and to demonstrate the effectiveness of distribution reinforcement activities. This LI approach is now being used by ESB Networks, and the process applies to HV network substations (i.e., 110 kV / 38 kV, 110 kV / MV and 38 kV / MV).

LIs allow a DSO to demonstrate network investment in the appropriate areas and to ensure network reliability, effective management of risk and security of supply in the long-term. LIs give an indication of substation utilisation and can be regarded as a proxy for network utilisation at present and forecast into the future. The ability to monitor utilisation of substations going forward will be the key in managing the ability of the network to respond to rapid increases in electrification due to decarbonisation of the energy system.

Load Indices Definition

The LI measures the loading level of station HV transformers against the firm capacity of those assets, using loading levels (percentage of firm capacity) and duration (hours/year) metrics. A scale of 1 to 5 is used, with 5 representing a heavily loaded asset and 1 a lower loaded asset. Whilst LIs are typically calculated on an annual basis, tracking changes in LIs over time can also provide a useful overview of asset loading status. For example, a rising LI indicates growing load and higher loading of assets. The outcomes can be used to provide an overview of network performance and be used to assist in prioritisation of investments or targeting of specific projects for delivery.

The definition of the different categories of LIs applicable to ESB Networks are outlined in the table below.

LI ranking	Definition
LI1	Significant spare capacity
LI2	Adequate spare capacity
LI3	Highly utilised
LI4	Fully utilised, mitigation requires consideration
LI5	Fully utilised, mitigation required

Current Load Indices

The table below sets out the number of HV substations in each LI category over the past five years. Since 2022 we are monitoring load indices on a calendar year basis. A reduction across LI2-LI5 from 2022 to 2023 was as a result of a number of offloading projects that were carried out over the two years after the new substations were energised in 2021. Load transfers are usually carried out in a period up to 24 months after the initial project (such as a construction of a new substation) is completed.

Number of substations in each LI category

LI rank	2020-21	2021-22	2022	2023	2024
LI1	277	334	310	348	324
LI2	123	100	119	110	111
LI3	37	25	26	22	28
LI4	62	48	49	34	61
LI5	68	60	67	61	59

The table above indicates the impact of projects planned on the LIs of existing substations. The LI report is used as an internal metric to manage and track changes in the peak loading of HV substations. A high or rising LI indicates that the network may be heavily loaded, whereas a low or falling LI suggests that extra capacity has been added to reinforce the network.

The need to reinforce substations by increasing capacity can be driven by an increase in electricity demand and renewable connections.

During 2024 the analysis and methodology of reporting the Load Indices has been enhanced. The data used to calculate the LI of each station has been added into a new LI dashboard. The LI dashboard uses historic data along with the current year's results and compares the LI rank and station capacity to calculate the change between the current year and previous years.

Results from the LI report and outputs will continue to inform business plans and prioritise reinforcement projects.

3

New Connections and Growth

3. New Connections and Growth

Efficient and economic connections are vital for our customers. We consistently strive to reduce the time from request to connection. Our focus is to enhance customer relationships through the design of a better experience, turning common field service challenges into customer engagement opportunities, increasing efficiencies to reduce the time from application to connection and the proactive provision of timely information to our customers.

Electricity Consumption (GWh)

Legend:
- Urban Domestic
- Rural Domestic
- Public Light, Misc
- MV
- 38kV Looped
- 38kV Tailed
- LV MD
- LV Non MD
- 110kV Network
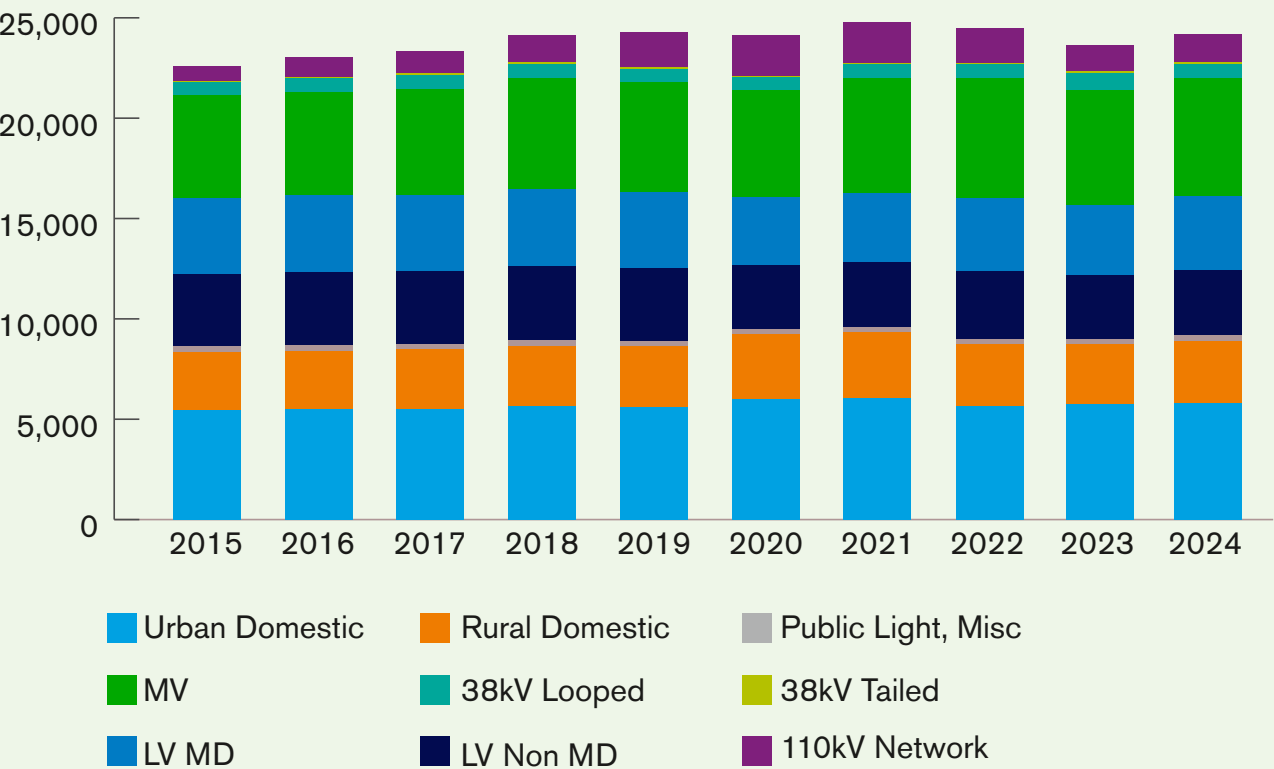
New Demand Connections

Providing new connections for demand customers involves providing a connection to the electricity network for domestic homes, housing schemes, apartment blocks, farms, businesses, and industry. Our purpose in ESB Networks has always been to connect and distribute electricity – safely, securely, and affordably. Acknowledging the central role that electricity plays in climate action, our purpose has evolved to deliver a clean electric future through the electrification of heat, transport, and industry. We continue to work towards enabling the 'Housing for All' government initiative which seeks to ensure 300,000 new social, affordable, cost rental and private homes are built by 2030. This is ensuring the sustainable social and economic development of communities and businesses while enabling Ireland's climate action response and transition to net zero.

Growth in new connections from 2021 to 2024 is outlined in the chart below. In 2024, ESB Networks completed 37,565 new demand connections. This comprised of 6,995 single domestic dwellings, 16,574 housing scheme, 9,126 apartments, 2,867 businesses and 2,003 unmetered connections (see Table below). In 2024, the volume of overall new connections fell by 8% when compared to 2023 (27% increase compared to 2021). A high concentration of G1 connections were delivered in Dublin, Cork, and Drogheda, with these areas accounting for approximately 62% of all G1 connections delivered nationwide. .

Completed Connections	2021	2022	2023	2024	% Difference 2024 v 2023
G1 - Apartments	5,619	9,785	12,185	9,126	-25%
G1 - Housing Schemes	11,167	15,541	15,883	16,574	4%
G2 - Single Domestic	8,082	8,489	7,478	6,995	-6%
G3 - Business	2,870	3,142	3,269	2,867	-12%
G3 - Business Unmetered	1,814	1,968	2,113	2,003	-5%
Total	**29,552**	**38,925**	**40,928**	**37,565**	**-8%**

New Demand Connections by Category and Year
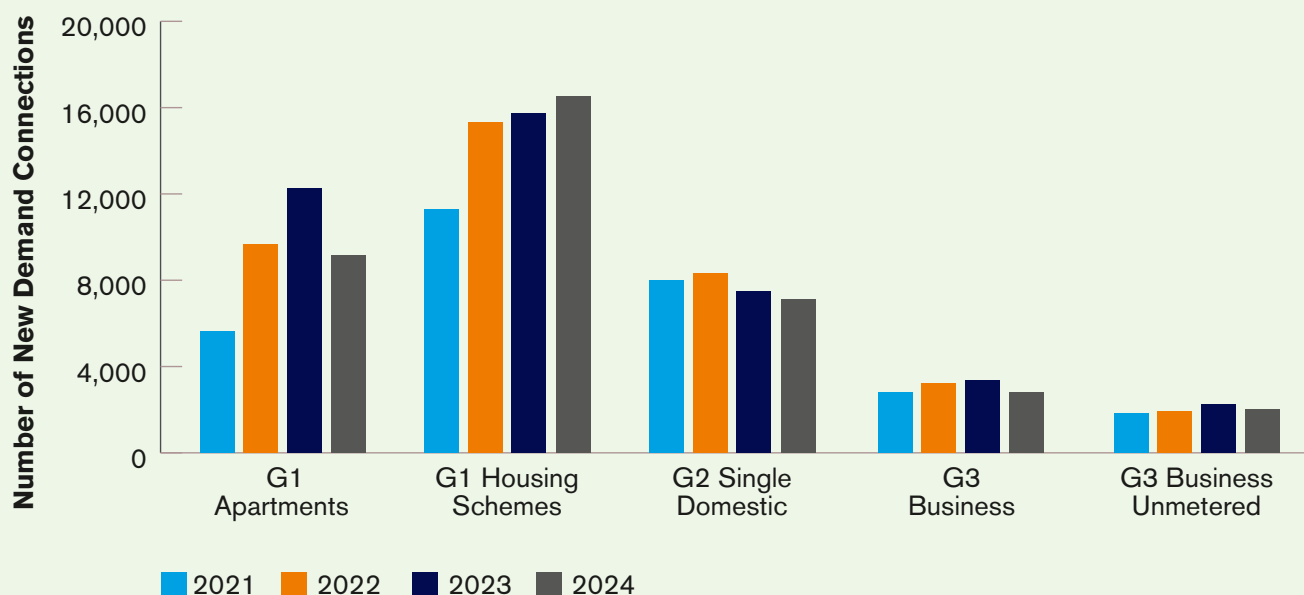
In particular in 2024 we:

- **delivered as per the Government's "Housing for all policy", as we continue to enable the electrification heat and transport.**
- **exceeded the forecasted delivery of G2 units.**
- **enabled the growth of housing scheme connections, with significant concentration of G1 connections in Dublin, Drogheda and Cork.**

The number of new connections have grown significantly during PR5 compared to previous price reviews and is expected to continue as more homes are constructed and as government targets increase. To meet this growing requirement, ESB Networks is taking a range of measures to meet customer needs and ensure that we comply with our Service Level Agreement (SLA) requirements. These measures include:

- ESB Networks has implemented a digital journey for all connection applications to deliver a seamless, online experience in line with customer expectations. More than 90% of customers are using the online account to apply and track their connections. The digital journey enhancements will continue through 2025 as we execute more projects to deliver excellent customer experience and service across the new connections landscape.
- In 2024, ESB Networks continued the journey of digitisation by adding the functionality for customers who applied for their new connection online to access and sign their connection agreement digitally.
- ESB Networks recently moved from a decentralised, regional resourcing model to a centralised 'Customer Delivery Design Department'. This ensured ESB Networks were in a position to efficiently assign work and resources to meet peaks in work associated with the quotation and design of new connections. Meeting the increase in demand for new connections and delivering within our SLAs.

- ESB Networks proactively and effectively continued to engage with relevant stakeholders throughout 2024. This included the Construction Industry Federation (CIF), and its associated organisation and the Irish Home Builders Association. We also greatly value our relationship with Local Authority stakeholders. ESB Networks' area managers continued to liaise regularly with Local Authorities and businesses on any issues of collective concern. This engagement has proved effective throughout 2024 ensuring efficient delivery of new connections during the price review period.

The tables below show ESB Networks' performance on new connections 'Time to Quote' (TTQ) for single domestic, domestic scheme, business and apartment connections. Separate results are provided for Business connections where the MIC is greater than 100 kVA.

The targets for TTQ are set at:

- **15 working days for single domestic dwellings and small businesses less than or equal to 100 kVA; and**
- **90 working days for connections to larger developments or connections over 100 kVA or MV connections.**

The tables demonstrate that we are working well within our KPIs with our G2 single domestic dwellings, averaging 11 days to quote against our 15-day target, and our G1s, averaging 32 and 27 days, respectively for domestic developments and apartment complexes, which have a 90-day target. Connections to businesses less than or equal to 100 kVA are averaging 33 days to quote, while connections to larger businesses exceeding 100 kVA are averaging 67 working days, which is well inside our 90-day target..

Connection type	Average number of days to Quote	Target
G2 Single Domestic Dwellings	11	15 days
G1 Domestic Developments	32	90 days
G1 Apartments	27	90 days

Connection type	Average number of days to Quote	Target
G3 Business (<=100kVA)	33	15 Days
G3 Business (>100kVA)	67	90 Days

The table below shows ESB Networks' performance on new connections 'Time to Connect' (TTC) for single domestic, domestic scheme, business and apartment connections.

The current TTC average – irrespective of the type of connection – is 12 days. The TTC report measures our performance against our new connection guarantee, which stipulates that we will complete the connection within 10 working days of confirmation of ducting to standard, registration with Supplier and receipt of the Completion Certificate, whichever is the latest. This guarantee is subject to the conditions in the letter of quotation having been met e.g. wayleaves and there being no significant network reinforcement involved. TTC transforms how we develop and deliver projects through changes such as new ways of working, closer collaboration, right first-time processes, and lean methodologies.

Connection type	Average number of days to connect	Target
G2 Single Domestic Dwellings	13	10 Days
G1 Domestic Developments	6	10 Days
G1 Apartments	10	10 Days
G3 Business	18	10 Days

Information about terminations and de-energisations are outlined in the following table.

Terminations and De-energisations

	2020	2021	2022	2023	2024
Connection points terminated[1]	18,092	16,399	15,293	15,393	21,474
Connection points de-energised[2]	1,645	1,069	3,026	1,694	2,193

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1 *Terminated: This includes connection points in vacant premises that have been terminated following previous de-energisation and de-registration, it also includes MPRN's associated with housing scheme quotations that have not progressed.*
2 *De-energised: for non-payment only.*

Connected Renewables and Energy Storage

ESB Networks' mission is to play a leading role in Ireland's transition to a low carbon economy and to provide secure, sustainable, reliable electricity in an affordable manner for all customers. With the Government's Climate Action Plan having ambitious targets for increased penetration of renewable energy by 2030, ESB Networks has continued its key role of connecting renewable generation to our network to help decarbonise electricity.

ESB Networks performed strongly in 2024, having connected 534 MW of Wind and Solar to the grid (71 MW Distribution (17 projects) and 463 MW Transmission (6 projects)) .

At the end of 2024, ESB Networks had enabled 6,323 MW of Utility Scale Renewable Energy: 5,081 MW of wind energy generation (2,316 MW Distribution and 2,765 MW Transmission), 849 MW of utility scale solar (146 MW Distribution and 703 MW Transmission) , with the remaining capacity coming from other renewable sources. For all renewables sources, 2,645.6 MW are connected at Distribution (DSO) level and 3,679.5 MW connected at Transmission (TSO) level.

In addition to the 849 MW of grid scale solar, approximately 663 MW of roof top, mini, micro, and small-scale Solar has been connected, totalling 1,500 MW of Solar connected to the grid.

In addition, ESB Networks conducted scoping, design and construction works associated with the pipeline of customer projects for connections throughout 2024. Many of these customer projects are participants in RESS-2, RESS-3 & RESS-4, the Government Renewable Energy Support Scheme.

Renewable grid scale energy (MEC) connected to the electricity system (2014- 2024)

Utility Scale Renewables Connected
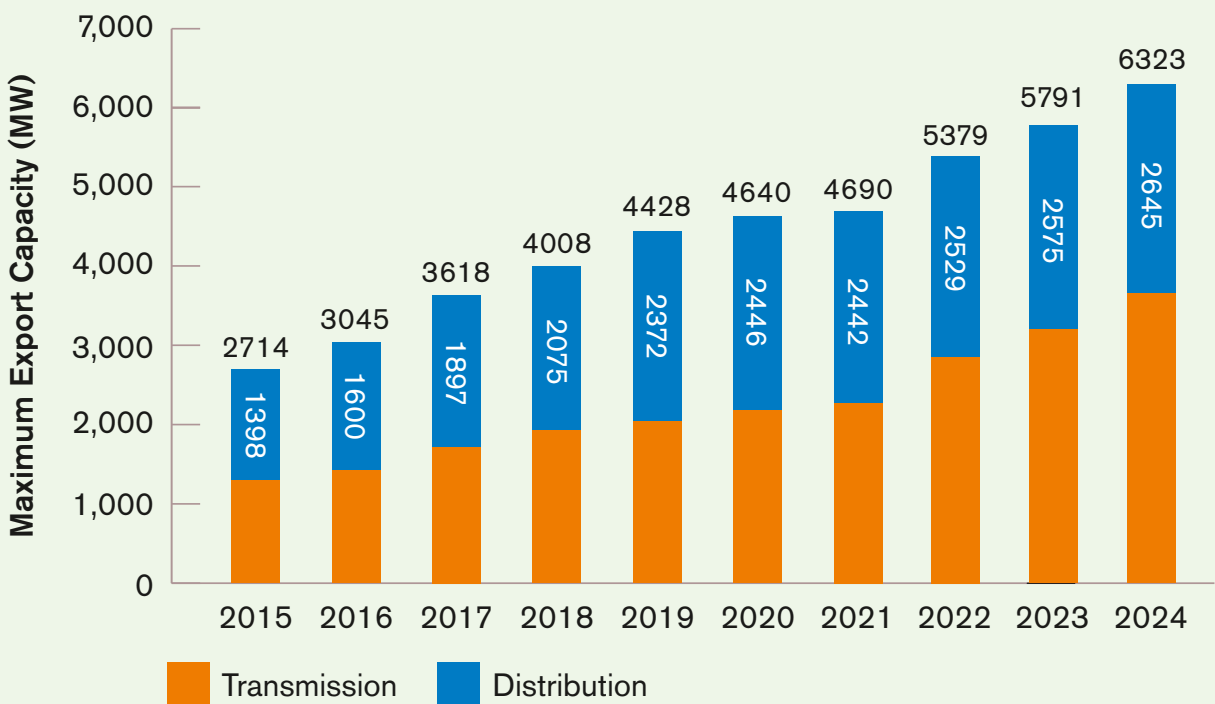
ESB Networks connected two large transmission system energy storage projects for 2024 totaling 175 MW (TSO), resulting in a total energy (battery and pumped hydro) storage capacity of 1,049 MW (75 MW Distribution and 974 MW Transmission) on the network by the end of 2024 (see the graph below). Energy storage provides system support services to the electricity system operators to enable increased penetration of renewable energy on the grid and to store renewable energy when the supply of energy exceeds demand.

Energy Storage (MEC) connected to the electricity system
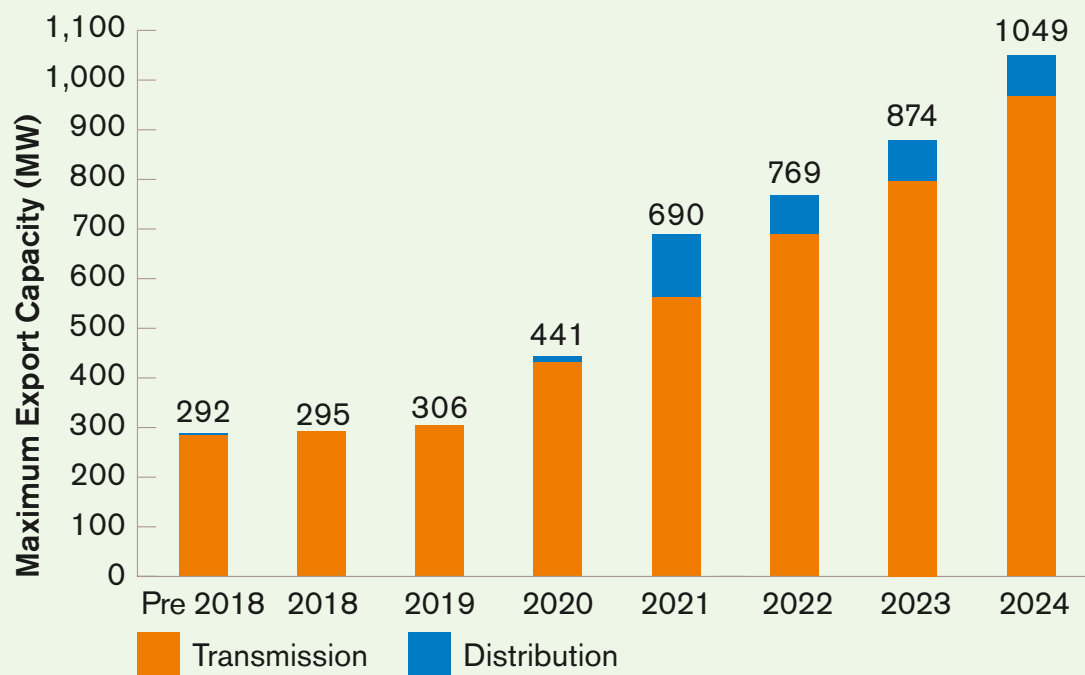
Key Achievements of 2024 (Distribution and Transmission):

- **1,000 MW** of Solar connection to the network by end of February 2024. Figure includes roof top solar and utility solar. Total utility and non utility scale solar at year end 2024 was 1,500 MW.
- **175 MW** Energy Storage energised in 2024.
- **1,000 MW** of Energy Storage connected to the network by end of April 2024. Figure includes Turlough Hill Pumped Storage and Battery Energy Storage.
- The **6,000 MW** of Utility scale renewables on the system threshold was also broken in 2024 and reached 6,300 MW of utility scale at year end 2024.
- **534 MW** Renewables energised in 2024 (utility scale renewable) across 23 projects.
- Total Connected to date – **6,987 MW** (6,324 MW utility scale & 663MW of non utility Scale).
- Record Total of **2,006 MW** of new energy sources connected in one year.

Enduring Connection Policy (ECP-2.4)

ESB Networks successfully completed the processing of 70% of the Enduring Connection Policy 2.4 (ECP-2.4) generator applications in 2024, with the remaining completed by March 2025.

The application window first opened for the ECP-2.4 batch in October 2023, and applications included a mix of wind, solar, battery, and hybrid projects. ESB Networks processed a total of 40 applications throughout 2024, leading to 26 offers issued in 2024 and early 2025. We also carried out extensive customer engagement across the period, with over 70 customer meetings taking place to agree the customer connection methods. As part of the ECP process, customers had the option to:

- **proceed with their full MEC and the associated network reinforcements;**
- **reduce MEC in order to avoid uprate works (where possible); or**
- **withdraw from the process for a partial application fee refund.**

The option to re-optimise available capacity proved very successful in allowing projects to remain in the process, which otherwise might have been withdrawn or requested to modify in the future.

The ECP-2.4 applications were processed in time for the upcoming RESS-5 auction qualification process which was due to take place in May 2025. Applications included a mix of wind, solar, and hybrid, projects. The aim is for these projects to proceed with a RESS-5 contract or Corporate Power Purchase Agreement and that they will start contributing to the Climate Action Plan (CAP) target of an 80% share of electricity generation supplied by renewable sources by 2030.

For ECP-2.4, the Stage 1 customer engagement took place between May 2024 and June 2024 in advance of the application fee balance requirement. Customer calls were scheduled for approximately 32 nodes, where significant uprates were identified. After the Stage 1 customer engagement, 6 ECP-2.4 applications were withdrawn.

The Stage 2 customer engagement took place between June 2024 and October 2024, following the technical assessment of the applicant's connection method by ESB Networks.

These meetings consisted of:

- **outlining the connection method at a high level;**
- **estimating costs associated with connection;**
- **discussing whether the possibility of MEC reduction to avoid certain uprates was available; and**
- **offering the option to withdraw ECP-2.4 applications and receive a 75% application fee refund.**

There were 34 Stage 2 customer engagement meetings, with some applications requiring more than one meeting. In total, six applications availed of the option to withdraw their application post-Stage 2 customer engagement. For the customers who indicated that they wanted to proceed with their application, the connection offer documentation was prepared and issued to each customer.

The number of connections offers and associated MW for each technology is outlined in the table below.

ECP- 2.4 Connection Offers Profile

Technology	Connection Offers	MW
Wind	5	70
Solar	18	91
Hybrid	2	5
Battery	1	40
Total	**26**	**206**

The ECP 2.5 Application window was open from 1st October – 30th November 2024. In early November 2024, ESB Networks held a three day customer clinic event. The event was open to all ECP-2 categories and provided customers with the opportunity to discuss their prospective ECP-2.5 project with ESB Networks. It gave customers a very early stage indication of the works that may be required at a particular node. In total, 24 project meetings took place over the three days.

Microgeneration

ESB Networks is committed to facilitating increasing levels of microgeneration connections to the distribution network. Customers who wish to install microgeneration and export excess electricity onto the electricity network are referred to as prosumers. As the DSO, ESB Networks has an important role to play in facilitating this transformation. We aim to support our customers along each stage of the process as they adopt small scale low carbon technologies and make the transition towards being active participants in the energy system. With the support of new robotic process automation tools, our teams are processing an ever increasing number of applications with no backlogs or delays.

Key points relating to microgeneration connections at the end of 2024 are as follows:

- **Simple 'inform and fit' process.**
- **New Online Application Form Introduced in 2024.**
- **43,800 applications were successfully processed in 2024 (an increase of over 30% from 2023, as outlined in the chart below).**
- **In the second half of 2024, a weekly average of 950 applications were successfully processed.**
- **By the end of 2024, ESB Networks facilitated 121,700 microgeneration connection applications to the electricity network, providing approximately 500 MW of renewable energy.**

Customers must inform ESB Networks at least 20 days in advance of installing microgeneration through completion of an NC6 form. This enables ESB Networks to ensure compliance with the required standards and to register the connection with the customers electricity supplier. For further information, please see the microgeneration section of the ESB Networks website.

Annual Number of Microgeneration Registrations (NC6)
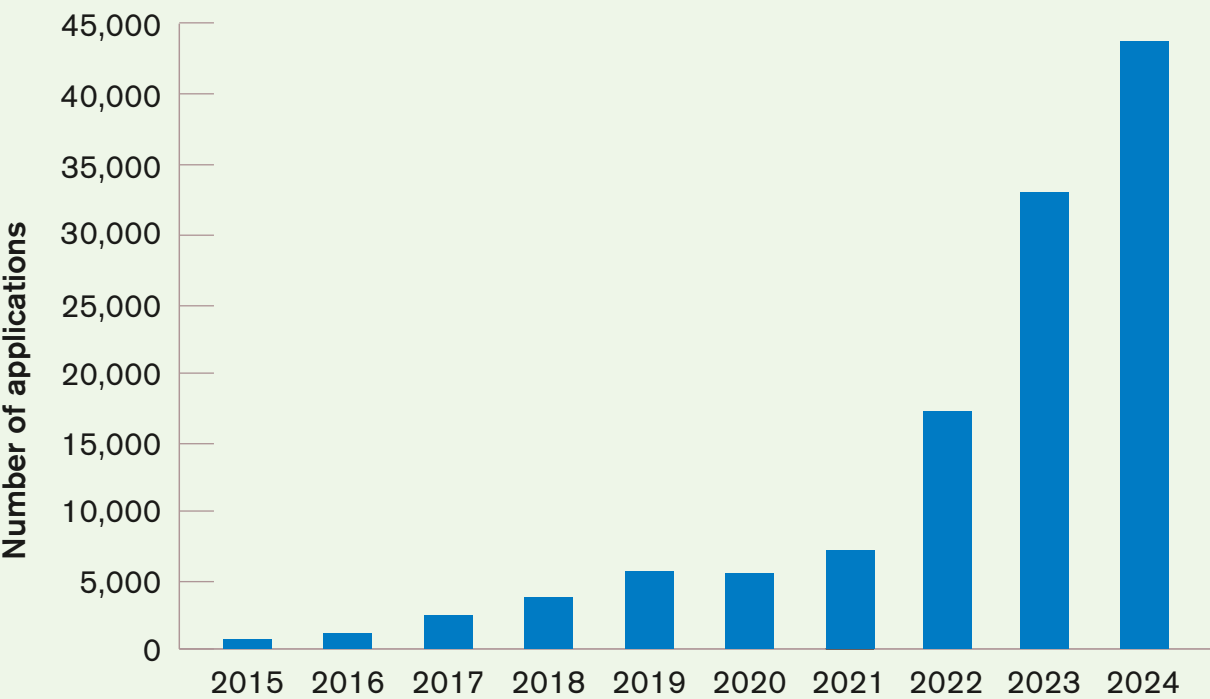
Mini-Generation

Following a very successful trial phase ESB Networks announced the transition to business as usual for its new simplified mini-generation application process. This process is for customers generating up to 50 kW (e.g., farms, business properties, community buildings, etc). This equates to, for example, between 18 and 150 typical solar panels. This move to an enduring process will support the delivery of Ireland's 2030 CAP targets. The streamlined mini-generation process ensures that it is even simpler for our customers who generate their own renewable electricity to safely connect their generator and to export their excess electricity to the local electricity network. This is allowing ESB Networks and customers to play an active role in connecting Ireland to a clean electric future.

Key points relating to mini-generation connections at the end of 2024 are as follows.

- **Streamlined connection process for customers with generators of up to 50 kW.**
- **Over 3,500 applications received by the end of 2024 (approximately 90 MW of renewable generation).**
- **In excess of 1,545 customers completed installations and connected their generators.**
- **Over 43MW of renewable generation already connected.**

In order to ensure the safety and resilience of the electricity network, all customers installing mini-generation must submit an NC7 application form and complete the ESB Networks' connection process prior to connecting their generator to the electricity system. For further information, please see the [mini-generation section of the ESB Networks website](#).

Small Scale Generation

Following an extensive trial phase ESB Networks successfully transitioned its new simplified small scale generation application process to business as usual. The process enables the quicker processing and connection of larger sites generating up to 200 kW, supporting progress towards achieving Ireland's 2030 CAP targets.

The new streamlined process is making it easier for our customers who generate their own renewable electricity to safely connect their generator and to export their excess electricity to the local electricity network. This allows ESB Networks and customers to play a more active role in connecting Ireland to a clean electric future. This process was successfully up and running when the Irish Government introduced the new Small Scale Renewable Energy Support Scheme (SRESS) in 2023 which enables these customers to be remunerated for exporting their excess electricity.

Key points relating to small scale generation connections at the end of 2024 are as follows.

- **Streamlined process for customers exporting up to 200 kW.**
- **Over 550 applications received (approximately 60MW of renewable generation).**
- **At the end of 2024 a total of 260 customers had installed and connected their generators.**
- **Approximately 29MW of renewable generation already connected.**

In order to ensure the safety and resilience of the electricity network, all customers installing small scale generation must submit an NC8 (or NC5) application form and complete the ESB Networks connection process prior to connecting their generator to the electricity system. For further information, please see the [Small Scale Generation section of the ESB Networks website](#).

National Networks, Local Connection (NN,LC) / Distribution and Markets System Operator

The decarbonisation of Irish society depends on fundamental changes to how energy is generated and consumed. To enable these changes at the right pace and cost, it is essential to connect renewable energy generation with how we use and store energy. Every Irish home, farm, community, and business is being called upon to play a role in this transition.

The National Network, Local Connections programme was established within ESB Networks to collaborate with customers and support them in enabling this transformation. The NN,LC Programme was integrated with other business areas as part of the newly created Distribution Markets and System Operation (DMSO) function within ESB Networks, in January 2024. A series of engagements were undertaken to communicate the DMSO transition throughout Q2 and Q3 2024. This included engagements with the CRU, DCEE and EirGrid. Briefings were also facilitated for the NN, LC Advisory Council; the National Smart Metering Programme's Industry Liaison Group; and the Industry Governance Group in the retail market.

The new DMSO organisational structure aims to deliver an efficient, effective, and unified Distribution Markets and System Operation function within ESB Networks. This structure is designed to best serve customers and industry stakeholders. Its overarching goal is to support the transition to a high-renewable, low-carbon energy system, with customers at its core, while maintaining operational excellence and security of supply.

DMSO will also lead the implementation of initiatives arising from the Clean Energy Package, which support Ireland's broader climate objectives. These initiatives will significantly impact distribution network operations and planning, introduce flexible demand markets, and drive the shift toward a renewable-centric energy system.

Our challenge is to deliver all of this efficiently, while continuing to ensure operational excellence and a secure, reliable energy supply.

Engagement

When the NN,LC programme was created, we acknowledged that a whole of energy industry approach would be required to deliver an inclusive network that supports the people of Ireland. Engagement with our stakeholders evolved and expanded in 2024. In 2024, we attended and presented at 20 conferences, held two NN,LC Advisory Council meetings, and participated in a variety of stakeholder meetings and roundtable discussions. Several public consultations took place across 2024, including the publication of two separate expressions of interest:

- Expression of interest for large energy users biomethane lighthouse; and
- Expression of interest for flexible demand connections.

In addition, two papers were published related to medium-duration demand flexibility.

- The closure of the public consultation on 14 February 2024, ESB Networks collated and assessed respondents' feedback; this informed the development of a recommendations paper submitted to the CRU (and published in June 2024).
- The Second Consultation Paper on the ESB Networks Demand Flexibility Product Proposal was published in October 2024. Following this release, a webinar was conducted on the 26th of November, which garnered 129 registrations. This online session aimed to explore the key elements of the recently published Second Consultation Paper.

A Call for Input Consultation Paper – supporting the DSO's preparation of the 2025-2029 multi-year plans – was published on 15 July 2024 for the following four PR5 incentives:

- Flexibility Markets.
- Visibility.
- Independent Role of the DSO.
- Estimated Restoration Time Accuracy.

In September 2024, ESB Networks published the DSO-TSO Multi-Year Plan 2025–2029 in collaboration with EirGrid, the national Transmission System Operator (TSO).The full DSO-TSO Multi-Year Plan 2025–2029 is publicly available on ESB Networks website.

In addition, ESB Networks also published the Flexibility Multi-Year Plan 2025–2029, which sets out our strategy for enabling flexibility on the distribution system to support the transition to a low-carbon energy future. This plan is also accessible on the ESB Networks website.

Beat the Peak

The successful 'Beat the Peak' domestic (BTP-D) initiatives continued throughout 2024 with iterative improvements and new campaigns under the tagline 'Is This a Good Time?' (ITAGT). This is a nationwide domestic behavioural demand response campaign, educating registrants about how to take control of their electricity consumption during peak hours. It also promotes and rewards customers who reduced their demand during peak events.

Campaigns launched in 2024 aimed to build upon the key learnings and successes of the pilot phase, and continued to educate participants on how they can take control of their electricity consumption, while also introducing new carbon related topics to participants such as flexible consumption, renewable generation and carbon abatement and support demand side flexibility.

Outlined below are some of the key outcomes from the 'Beat the Peak' domestic products to date:

- The 'Is This a Good Time?' product reached 25,619 active participants (as of December 2024)

- Over 100,000 responses to events were received, with over 90,000 actions taken

- In 2024, we had three Peak events, 13 Flex Up events and nine Flex Down events. The average response rate for Peak Events was 36% with an average action rate of 93%. The average response rate for Flex Up events was 31% with an average action rate of 78%. The average response rate for Flex Down events was 29% with an average action rate of 92%.

- A new rewards value for the "Is This A Good Time?" product was implemented in November 2024.

- The 'Beat The Peak' digital game, aimed at supporting learning on the impact of gamification in the journey towards proactive energy management, was launched to a test audience of 10,000 participants.

- A school's programme was developed to embed concepts related to demand flexibility for secondary level students, commencing in September 2024.

- Customer research continued with Wave 5 of the Customer Attitudinal Tracker completed in September 2024 and Wave 6 ongoing as of December 2024

- ESB Networks collaborated with electricity suppliers – in 2024 to co-brand 'Is This a Good Time?' marketing communications and promote the initiative through the suppliers.

Beat the Peak Business

ESB Networks' Beat the Peak Business is a demand response scheme where eligible commercial electricity users can get paid to reduce their electricity demand between 4:30pm - 7pm, during the service window, on business days (Monday to Friday, excluding public holidays). Launched in late 2023 the scheme continued through 2024 and is scheduled to end in September 2025.

The scheme was built based on the learnings from Beat the Peak Commercial Active (BTPCA) and the non-event-based Beat the Peak Commercial Daily (BTPCD) and incorporates:

- Generation Interaction checks: Introduction of generation interaction checks to assess eligibility for summer participation (April – September).

- Improved baseline accuracy: Refinement in historical demand analysis to better estimate flexible capacity and improve response reliability.

- Improved payment and reconciliation: Payments processed based on achieved demand reduction, with reconciliations for participants also engaged in other energy markets (or providing DS3 System Services to the TSO).

- The scheme currently has two contracted Flexibility Service Providers taking part as of April 2025.

National Energy Demand Strategy (NEDS)

In 2024, ESB Networks continued to make significant progress against its National Energy Demand Strategy (NEDS) obligation, both in a leading and supporting role:

- DSO Flexibility Procurement (National Energy Demand Strategy action 2.11) – ESB Networks completed a second-stage consultation on detailed aspects of the product design to support medium-duration flexibility procurement tender process. This action was closed out in December 2024.

- Biomethane Lighthouse (NEDS 2.12) – ESB Networks published a plan to deliver biomethane lighthouse project, including an indication of anticipated biomethane volumes and further details to deliver flexibility. A plan was agreed with supporting bodies and an Expression of Interest (EoI) published in Q4 2024.

Distribution Losses

Distribution system losses are inherent losses within an electrical system. Distribution system losses from 2019 to 2024 are outlined in the chart below. In 2024, approximately 6.52% of the energy that was put into the distribution system was accounted for as losses. This was a 0.23% reduction on the distribution system losses in 2023. This reduction is mainly a result of increasing export of microgeneration, minigeneration and small scale generation to the distribution system at low voltage, especially where this generation is installed in urban areas with minimal transfer of energy through distribution network (between exporting and importing customer).

Distribution System Losses as a % of injections
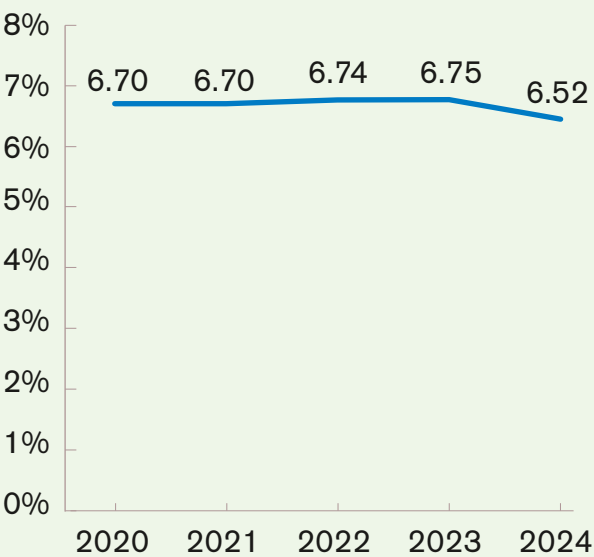
Losses are comprised of 'technical' and 'non-technical' losses.

• Technical losses are heat losses arising from the passage of electricity through lines, cables, and transformers. Technical losses depend on the volume of electricity flowing in the system and the characteristics of the lines, cables, and transformers.

• Non-technical losses on the other hand are electricity units which are unaccounted for, for example as a result of theft arising from unauthorised connections.

Some of the factors that affect the percentage of electricity lost are outlined below.

• **The proportion of electricity that is distributed at the various voltage levels**. Electricity distributed to customers connected at higher voltages incur less system losses than electricity connected at lower voltages.

• **Utilisation of assets.** If the loading of transformers, lines and cables increases, losses will also increase. As networks are naturally reinforced, this will normally result in a reduction in losses.

• **Operating voltage of lines and cables.** The higher the operating voltage of lines and cables, the lower the losses for a given electricity throughput.

• **Generator connection.** As more generation is connected to the distribution network there is an impact on losses. There are additional losses on the lines and cables connecting to wind farms and other large generation sites. Some losses may be avoided due to supply of electricity locally displacing electricity supplied via the transmission system, particularly for generation connected at LV (e.g., photovoltaic generation).

• **Unauthorised connections/metering tampering.** The propensity for unauthorised connections and meter tampering in the customer base and the effectiveness of measures to reduce it.

More current flows through the network as demand on the distribution system increases. It is not feasible to eliminate losses completely, but what is required is to manage the losses to an economically optimum level, that is, the point where the total cost of supply to the customer is minimised. ESB Networks recognizes the importance of managing losses and commits to continuing to manage losses optimally on the distribution network.

Examples of how ESB Networks is managing losses are provided below.

Capitalisation of losses in network investment decisions
The efficiency of equipment is factored into purchasing decisions. The cost of the losses associated with each design is included with the plant costs, so that the overall total cost of ownership over the lifetime of the investment is minimised. In general, this means that designs which are energy efficient are chosen over designs which are not, all else being equal.

Conversion of 10 kV to 20 kV
ESB Networks is undergoing a program to convert its 10 kV network to a 20 kV network. One of the primary benefits of converting the electricity network to a 20 kV network is that the thermal capacity is increased by a factor of two and voltage drop performance is increased by a factor of four. In addition, the conversion to 20 kV reduces losses by a factor of 4. In effect, 20 kV is a vital enabler of demand growth that is anticipated as a result of low carbon government initiatives in relation to e-Heat and e-Transport. The reduction in Carbon that can be achieved by extending this 10kV to 20kV programme is highly significant due to the reduction in losses achieved.

The conversion programme continued in 2024, with 378 kilometres of the network converted to 20 kV. This results in an estimated avoidance of 445,664 kg of CO2 emissions per year. To date, ESB Networks has converted 53% of the 10 kV network to 20 kV.

The expected energy savings through the reduction of losses by converting 10 kV network to 20 kV during PR5 is presented in table below.

Year	Average losses saving kW/km	Converted kilometres	Yearly Average loss reduction (kW)	Annual energy savings (kWh/year)
2021	0.826	255	210.6	557,940
2022	0.826	109	90	238,492
2023	1.014	618	626.7	1,661,184
2024	1.746	378	660	1,749,006

4 Environment

4. Environment

ESB Networks is dedicated to conducting our business in a way that prioritises our environmental and sustainability performance and reflects our commitment to responsible management of these areas.

Our Networks for Net Zero Strategy outlines our role in supporting the Government's Climate Action Plan 2024 and the decarbonisation of electricity by 2040, aiming for Ireland's net zero ambition by 2050. To learn more about our approach, please refer to ESB Networks' Policy Statement on the Environment and our Annual Environmental Performance Report on our website.

Throughout 2024, we have pursued the strategic commitments outlined in our Networks for Net Zero Strategy, ensuring continuous progress for all our customers and stakeholders.

Energy Usage – Buildings and Fleet

Electricity usage in our buildings and the associated carbon footprint was down 16% in 2024, compared to 2023. It is worth noting that in ESB Networks, sustainable carbon reducing measures are a feature of all current and future building upgrade works and include lighting, insulation, energy efficient heating systems, windows, and other works.

Vehicle fleet fuel consumption was 13% higher in 2024 compared to 2023 (however, this increase was driven by increased road milage due to both an increase in storm response and associated repair works). Despite the increase last year, there are still newer and more efficient vehicles being brought onto the fleet, and an expansion of our electric vehicle fleet. Ongoing engagement with the vehicle industry continues to search for and identify viable low carbon vehicle solutions for the fleet, with most viable options addressing the area of smaller fleet vehicle replacement.

Carbon Emissions

ESB Networks' carbon emissions can be categorised into three different scopes.

Scope 1 – These are direct emissions from ESB Networks owned or controlled sources. This includes our vehicle fleet, SF6 emissions from switchgear, diesel generators, and from gas heated buildings.

Scope 2 – These are typically indirect emissions from the generation of purchased energy, such as electricity used in ESB Networks' buildings. However, as ESB Networks is an electrical utility, this also includes transmission and distribution losses from the network.

Scope 3 – These emissions are all indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions. This includes waste, capital goods, business travel, employee commuting, working from home and the upstream emissions of purchased fuels.

ESB Networks' annual carbon footprint for 2024 is detailed in the table and figure below.

Scope	Category	Tonnes of CO2 Equivalent
Scope 1	Vehicle Fleet - Direct Emissions	13,275
	SF6 Gas	3,059
	Perfluorocarbon Tracer (PFC) *	2.37
	Generator Emissions*	981
	Building Emissions - Heating Gas *	208
Scope 2	Building Emissions - Electricity	3,343
	Transmission and Distribution Losses	553,974
Scope 3	Waste *	148
	Capital Goods	161,764
	Business Travel	3,132
	Upstream Emissions for Purchased Fuels	3,248
	Upstream Emissions of Gas Consumption in Buildings *	34
	Employee Commuting	1,855
	Working from Home*	647
Total Tonnes CO2E		**745,670**

* These categories are included in the 'Other' category in the below figure.

Transmission and Distribution losses (T and D losses) is ESB Networks' largest carbon footprint category. Carbon emissions are very dependent on the intensity of electricity generation. As we connect more renewable sources to the grid, this will result in further reductions in carbon emissions in future years, and thus a continuous downward trend.

Overall CO2e Emissions Note:

Overall CO2 equivalent figures compiled using relevant Department of Environment, Food and Rural Affairs (DEFRA) and Sustainable Energy Authority of Ireland (SEAI) CO2 conversion factors.

Breakdown of ESB Networks' 2024 Carbon Footprint

Vehicle Fleet – Direct Emissions **13,275**

Building Emissions – Electricity **3,343**

Upstream Emissions for Purchased Fuels **3,248**

Business Travel **3,132**

SF6 Gas **3,059**

Employee Commuting **1,855**

Generator Emissions **981**

Other **1,039**
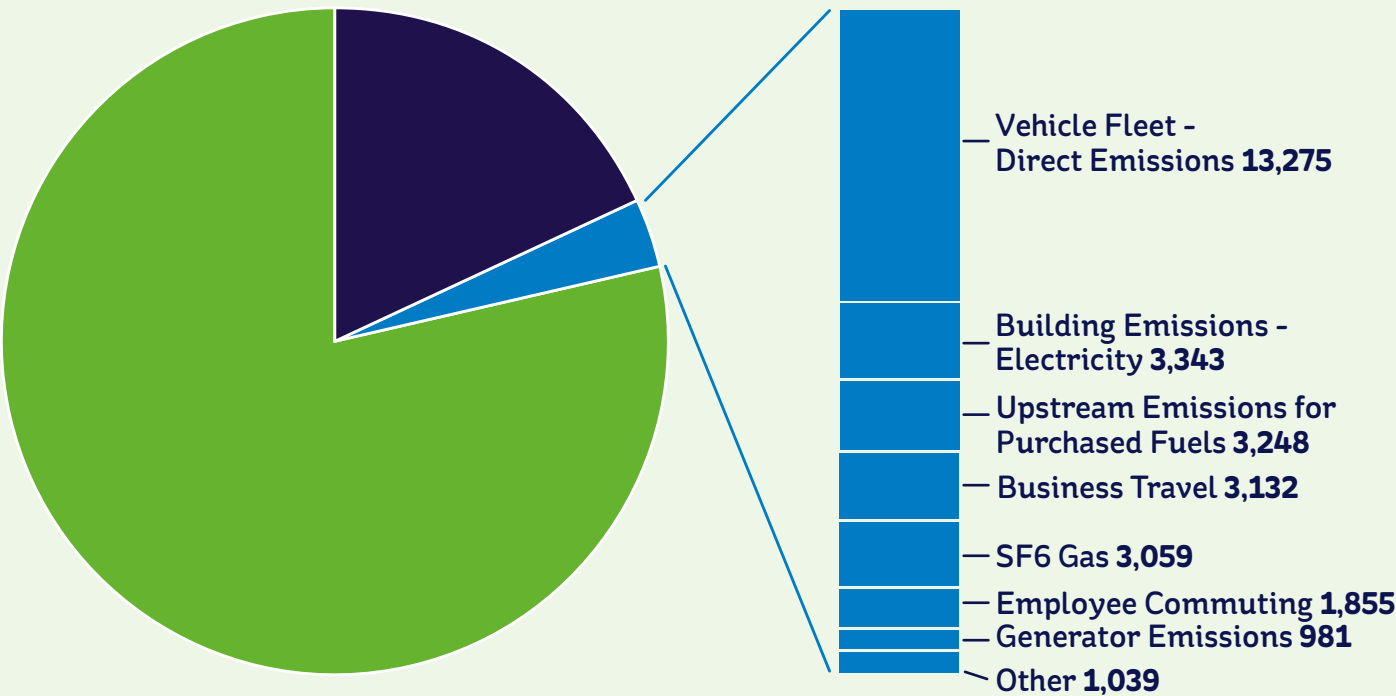
SF6 Gas Management

SF6 is used in a significant portion of ESB Networks' high-voltage switchgear assets on the transmission and distribution networks.

It is used because of its very high electrical insulating properties, which facilitate efficient and safe operation of the switchgear. Emission rates for SF6 gas are reported to the EPA on an annual basis in line with Regulation (EC) No 166/2006.

In 2024, 125.9kg of SF6 was emitted due to equipment faults, representing 0.06% of the total installed inventory of SF6. The comparable 2023 leak quantity was 90.29 kg, representing 0.04% of inventory. This overall leakage rate compares favourably to other European utilities.

SF6 Gas - Tonnes CO2 Equivalent
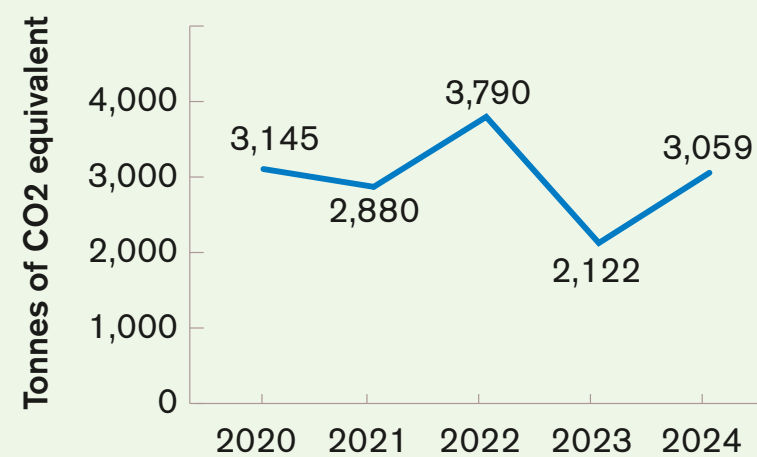
Fluid-Filled Cables

ESB Networks responds to each leak and continuously works to reduce its annual leakage by improving on leak identification and repair times and by progressing our fluid filled cable (FFC) replacement programme.
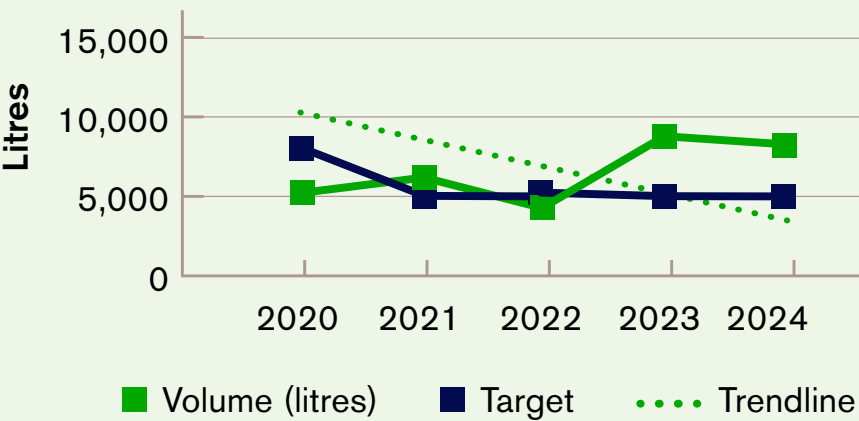
Six distribution circuits had Local Authority notifiable leaks in 2024.

The graph above outlines target and outturn fluid cable leakage from 2015 to 2024. ESB Networks' company standard, 'Management of Fluid- Filled Cables' set a target cable leakage volume of 5,000 litres per annum from 2021 to 2024. In 2024, 8,259 litres of cable insulating fluid leaked from ESB Networks' HV cable network, compared to 9,016 in 2023. Cable leakage is due to factors such as the increasing age of the assets, third party damage and environmental factors.

Waste Management

ESB Networks is committed to being at the forefront of sustainability and the circular economy, and the effective management of waste is a fundamental part of this environmental management goal. Notably, in 2024, significant advancements were made towards this objective including:

- Depot recycling rate of 84% achieved for municipal solid waste & Scrap Metal Recycling and 83% for all Non Hazardous & Scrap Metal Recycling combined in 2024.
- 100% of Networks assets including Oil Filled Equipment, Scrap Metal, Transformer Oil & Network Poles are recycled.
- New facility established for refurbishment of interface transformers to increase our recycling and reuse of legacy equipment, avoiding disposal.

Additionally, ESB Networks maintains memorandums of understanding with Dublin City Council, South Dublin City Council, and Dun Laoghaire-Rathdown County Council to address illegal dumping of waste, litter and graffiti at unoccupied ESB Networks' facilities.

Environmental Management System (EMS)

Since 2010, ESB Networks has been using an EMS that has been certified to the ISO 14001 Standard. This has enabled the company to identify, evaluate, prioritise, and manage environmental risks associated with its operations. The EMS covers all of ESB Networks' activities, services and processes related to managing the electricity network on behalf of ESB Networks. The EMS maintained its ISO 14001 certification after external surveillance audits in 2024, reporting no non-conformances.

Managing the Environment During Construction

In line with our commitment to deliver PR5 by 2025 and in keeping with our ESB Networks Net Zero Strategy, a sustainability approach is a key consideration in the design and construction stage of all our projects.

ESB Networks has remained committed to achieving timely and cost-effective project delivery, despite the demanding landscape of project planning and consenting. To this end, ESB Networks has made continuous improvements and adapted to the challenges of the environment to ensure successful project implementation.

At the planning and design stage for each Capex project, multi-disciplinary technical teams work to develop projects and site-appropriate construction methodologies in order to deliver connections to customers, while protecting sensitive receiving environments. Detailed design packs, capturing the requirements (e.g. planning consents) are provided to our external contractors who are increasingly important to project delivery. Project support through document review processes (e.g., inputs to Construction Environment Management Plans, Traffic Management Plans, Resource & Waste Management Plans, etc.) is key to ensuring delivery on planning permission condition requirements. Oversight of construction projects is achieved through the appointment of specialists such as Environmental Coordinators, Project Ecologists, Ecological Clerks of Works, Project Archaeologists where appropriate as well as through the implementation of our environmental audit program.

The Waste Enforcement Regional Lead Authorities (WERLA) oversees enforcing waste regulations and ensuring the appropriate handling of construction and demolition waste at a national level. When requested, ESB Networks provided WERLA with data on their construction undertakings that could produce construction and demolition waste. This information is then passed on by WERLA to waste enforcement officers from local authorities throughout the country, who conduct inspections to verify that waste and materials are being responsibly managed at construction sites. This effort is part of a strategic approach to managing construction and demolition waste in the state.

Biodiversity

ESB Networks remains very focused on the importance of biodiversity in the Irish landscape, and to ensure its activities are managed in a sustainable manner in relation to wildlife and habitat protection. 2024 saw continued advances by ESB Networks with regards to biodiversity action.

In September 2024, ESB Networks published its first Biodiversity Strategy, entitled 'Networks for Nature '. This strategy has been developed through leveraging our own internal experience, informed by specialist input and draws from international best practice and innovation implemented across the energy sector. It is cognisant of the objectives of Ireland's Fourth National Biodiversity Action Plan 2023-2030 and of the 'Whole of Government, Whole of Society' approach which is advocated therein. 'Networks for Nature' is informed by the following overarching objectives; Integrate Biodiversity, Enhance Nature where We Operate, Build Capacity, Explore Synergies for Biodiversity, Innovate & Improve and Act Responsibly. The objectives are underpinned by a suite of actions and targets which will facilitate our progress for biodiversity at a strategic, project and site level. Networks for Nature will be reviewed and updated on a five-yearly cycle to ensure it best reflects science-based decision making and any further developments in policy at all levels.
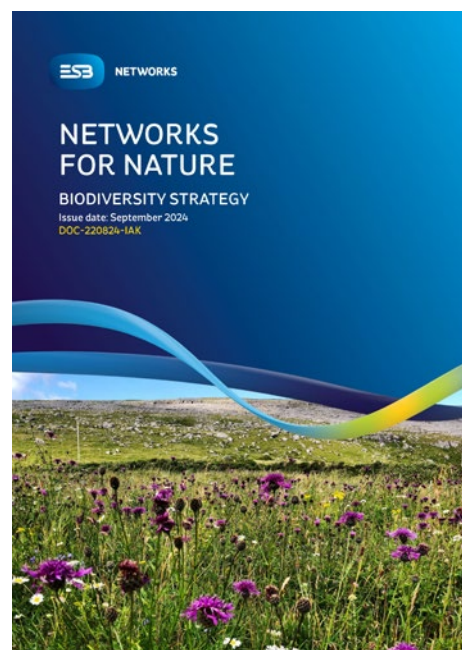
In parallel with the development of our strategy, during the first half of 2024 ESB Networks was a sponsor and key contributor to the development of new biodiversity guidance for the electricity sector. EurElectric commissioned this first-of-a-kind guidebook to support Distribution System Owners and renewable developers in scaling up nature-inclusive practices across the lifecycle of their projects. The guidebook focuses on grid, wind, solar and hydropower technologies and outlines guiding principles for integrating biodiversity when siting, designing, building, operating and decommissioning infrastructure. It is hoped that through applying the guidance to projects and operations, the electricity sector can assist in efforts to retain natural habitats, protect endangered species, and even create new possibilities for wildlife to flourish.

A number of ESB Networks' documents are in place to advise staff on biodiversity matters and communicate their requirements for legislative compliance. Training with regard to designing and undertaking work in proximity to sites designated for nature conservation was rolled out during 2024, while a new procedure relating to identification of invasive species and biosecurity response actions was finalised. Staff continue to regularly engage with the Networks Environment Team and ecology staff on various biodiversity related issues, including screening for Appropriate Assessment, ecological monitoring of construction projects and the implementation of mitigation measures where required.

ESB Networks continues to support the All-Ireland Pollinator Plan (AIPP), pursuing opportunities for more pollinator-friendly management of properties, where this fits with the needs of safety and business operations. ESB Networks has expanded its trials regarding pro-pollinator landscape management at its properties. Building on learning from previous years' actions at the National Training Centre in Portlaoise, long-flowering meadow management of the training field continues, and 'No Mow May' at 19 of its depots and offices during 2024 was applied in tandem with communications to staff regarding the rationale and importance of such actions. In addition, working collaboratively with ESB Enterprise Services and our Facilities Management Contractors, a herbicide-free weed control methodology was trialled at the Finglas depot.

Staff from the ESB Networks Environment Team have continued to represent the business on the Business for Biodiversity Ireland Platform following its formal launch in January 2024. This is a government-backed national platform helping Irish businesses transition towards a 'nature positive' way of working, where they can actively seek to support nature restoration. The initiative is a key objective delivery vector in the Fourth National Biodiversity Action Plan, with an aim to scale up to 900 businesses over the duration of the plan. Finally, ESB Networks has continued its preparations for reporting requirements relating to Biodiversity and Ecosystems under the Corporate Sustainability Reporting Directive (CSRD) requirements. Significant work has been undertaken with regard to consolidating spatial data and operational information for relevant Networks assets, for the purpose of reviewing their potential effects on Biodiversity Sensitive Areas across the country.

5 Safety

5. Safety

Our purpose in ESB Networks has always been to connect and distribute electricity – safely, securely and affordably.

The safety, health and wellbeing of our staff and contractors as well as the communities and customers we serve, continues to be a core strategic priority and area of focus. Our Safety Strategy sets out our strategic intent and commitment to how we keep our network safe. It outlines how we raise awareness about the importance of safety, health and wellbeing among our staff and contractors, as well as the dangers of coming into contact with, or being in close proximity to, our electricity networks and equipment for the general public. In 2024, we continued to make improvements across the key areas of safety compliance, engagement, communications, safety culture transformation, road safety and public safety, while all the time ensuring the provision of essential services to the communities we serve.

External Validation of Safety Management System

In keeping with our aim to continuously improve and develop our capability and performance levels in safety, health and wellbeing, ESB Networks successfully retained its certification to the international ISO 45001 Occupational Health and Safety Management System standard in 2024. ESB Networks was also found to be in compliance with the public safety conditions set out the in the Distribution System Owner, Distribution System Operator and Transmission System Owner licences issued by the CRU. The National Standards Authority of Ireland (NSAI) recognised the continued effort and commitment that is required to continuously drive safety improvements.

Safe and Sound – Safety Culture Transformation Programme

During 2024, through our internal 'Safe & Sound' programme we continued with our commitment to creating and embedding a positive, proactive and engaging workplace safety culture where safety, health and wellbeing is at the centre of everything we do. Safe & Sound is an employee-centred safety culture transformation programme based on changing attitudes and perceptions to safety, health and wellbeing. The objective of the programme is to build and embed a world class values-based safety culture that is sustainable over time, where people speak up, challenge unsafe practices, and take responsibility for their own safety and the safety of others.

A key structure in the Safe & Sound culture transformation programme is our local and regional Safe & Sound Leadership Teams. These teams are comprised of a cross-section of the local team who are interested in taking on complex safety culture challenges and developing our culture. ESB Networks has approximately 40 of these safety culture teams operating at local, regional, functional and senior management levels. The teams drive and embed safety culture improvement at a local level and are the backbone to safety culture transformation in the business.

Throughout 2024 a key focus was on how we learn from information that our people provide, whether this be from Good Catch and Near Miss reporting, analysing incidents or creating engaging team meetings where people feel that they can openly and honestly share. Based on feedback from our people our processes of team briefings, investigating and sharing learning, and engagement around reporting have been revised and improved.

It is important in any safety culture journey to periodically assess and reflect on progress, and towards the end of 2024 we began a safety culture review. This takes the form of a standardised safety culture survey along with focus groups to gather qualitative data. The review will inform our next steps in Safety, Health & Wellbeing in the organisation.

Road Safety

As an employer, ESB Networks has a responsibility to provide a safe place of work and a safe system of work. The ESB Networks' road safety 'Driving for Work' programme, reminds staff that when driving and using the road that it needs to be done in a safe manner. Unfortunately, in 2024 174 people lost their lives on Irish roads, which is an 8% decrease on 2023. Road safety continues to be a priority within ESB Networks, and there has been an increased focus on all aspects of road safety. In 2024, we continued to implement our Road Safety Strategy (2021 – 2025), which is the focal point of our safety delivery. Some of the key highlights of 2024 are as follows.

Reduction of Speeding Infringements
The Road Safety Strategy 2021-2025 has continued to successfully reduce the number of speeding infringements within our fleet. Through the various safety controls which includes driver conversations, driver training and the communication of business line road safety reports have all contributed to reducing the risk of a road traffic collision. This improvement underlines ESB Networks' sustained commitment to road safety and protecting not only our staff but all road users.

Communication and Engagement
In 2024, our engagement with the business has improved road safety. The Road Safety Bureau (RSB) team conducted safety sessions across the business, communicated bank holiday safety messages, delivered 12 core briefs, organised a family-oriented road safety competition, and produced 4 videos on key road safety behaviours.

Communication and engagement with our staff are essential in maintaining a culture of safety on the roads.

Public Education and Awareness

Our customers are at the heart of everything we do, and we continue to strive to ensure their safety and the safety of those who work on, or may come in close contact with, the electricity network. Increasing awareness of electrical safety risks is essential, and safety education and awareness programmes continue to be a strategic objective of our public safety activities.

In 2024, we continued to implement our Public Safety Strategy (2021 – 2025), which is anchored in the core purpose of our business and continues to be a core strategic priority and area of focus for ESB Networks.

We re-ran our Safety campaign, 'Are You Sure It's Safe' to continue on the momentum of our safety message. The simple and clear campaign messaging of 'Are You Sure It's Safe?' and 'Stay Safe, Stay Clear' helps to encourage the public to stop and think of the danger when they are close to the electricity network. This campaign has continued to resonate with our key at risk groups since its creation in 2016.

In 2024, our safety advert ran across TV, video-on-demand, radio, digital audio, social media, display, and paid search. English and Irish creative was used across majority of platforms. Our campaign includes four key risk scenarios:

- **builders using scaffolding near overhead wires.**
- **people using drones near overhead wires.**
- **people hanging flags and bunting on electricity poles; and**
- **a generic fallen wires message.**

Awareness figures for the campaign remained high. From our research, the awareness level of the campaign averaged 87% in 2024.

ESB Networks' social media channels continued to target key at-risk audiences, with always on safety messaging targeting our key 'at risk' sectors (i.e. farming, construction, general public, schools).

ESB Networks promotes educational resources on safety in primary schools nationally. The 'Stay Safe, Stay Clear' primary school competition calls for primary school children to create posters with electricity safety tips. This competition helps to educate primary school children about how to stay safe when they are playing outdoors near electricity poles and overhead wires. We've received great engagement with the competition to date. In 2024, a total of 1,794 entries were received from 104 primary schools. These schools were located across the 23 counties, providing an excellent geographical spread of engagement. In 2024, an interactive game was created for school visits, e.g. with HSA to teach children safety tips.

We issued several press releases on topics such as storm safety and fallen wires, winter safety, and working near electricity wires. This provided an opportunity to engage with large audiences through both national and local radio. We provide more detail on sector specific initiatives relating to farm, construction and local authorities, state agencies and emergency services below.

As part of the ESB Networks website upgrade project, we updated the safety section on the ESB Networks' website to enhance the user experience and make content accessible to all users.

Farm Safety

In 2024, through our partnership with the Irish Farmers Journal, we ran six full page adverts / advertorials which were issued to both their online and offline readers. Our informative videos issued during Farm Safety Week 2024, along with ESB Networks own social media channels continued to extend our reach among the Irish farming community. For example, our May-July digital advertising campaign delivered over 350,000 digital impressions with an average click-through-rate of 0.13%. Our display campaign with Agriland resulted in over 2.5 million impressions. Our 'Safe Family Farms' partnership with the Irish Farmers Journal continued into its tenth year. In 2024, to raise awareness of electrical safety on farms, we made further additions to the library of general farm safety videos, regular safety pages and created full-page public safety advertorials.

We delivered safety talks to Teagasc colleges and University College Dublin's Agriculture and Food Science School as part of the 'Champions for Safety' initiative, in association with the Health and Safety Authority (HSA) and FBD Insurance. Our sponsorship of the Farming News podcast, which included sponsor name check in intro and outro by host, a 30 second mid roll advert and branding on all print and digital material, resulted in 5,165 listeners. We sponsored fifteen productions of Farm Tech Talk. ESB Networks Public Safety Manager, was featured on four episodes, which had 6,211 listens and 8,881 views.

Construction Safety

Our partnership with the CIF resulted in a strong focus on electricity for 'Construction Safety Month 2024', with electricity recognised and promoted as one of the five key construction risks via a webinar discussion. This panel discussion was chaired by our partners in CIF, with contributors from other CIF member bodies and utility providers. In 2024, we were also featured in the Construction Management Ireland Yearbook and CIF Construction Magazine.

Local Authorities, State Agencies and Emergency Services

Electrical awareness sessions were delivered to front line operational staff and contracting partners of Uisce Eireann and various local authorities during 2024. In addition to this, the ESB Networks' Training Centre hosted electrical appreciation sessions with the Uisce Eireann and the Health & Safety Authority in order to raise their awareness levels associated with the hazards and risk of working close to the electricity network.

During 2024, electrical safety sessions were also held with all OPW outdoor staff and an e-learning module on electrical safety was developed in collaboration with Coillte for onward delivery to their timber harvesting contracting partners.

As part of our commitment to engaging with the emergency services sector, we delivered awareness training to approximately 30 newly appointed Fire Service Incident Commanders at national training events in Sligo and Bray, as well as attending other local training events.

ESB Networks continued to participate in the An Garda Síochána-led metal theft forum, which met during the year to share information and coordinate responses to break-ins and metal theft. Our staff continued to provide an excellent emergency response service in all situations, including major storms, emergency calls from the public and from the other emergency services.

Networks Work Programmes and Critical Safety Processes

The delivery of our public safety work programmes (including cyclical hazard patrols, maintenance of overhead and underground networks, and timber cutting) continued to be prioritised during 2024 to ensure public safety. The delivery of these programmes is monitored and reviewed regularly to ensure delivery within agreed cycles. Our incident recording system recorded and actioned all public safety incidents and provided important information that led to focused public safety initiatives and campaigns.

The internal staff monthly safety communication, which is circulated to all staff in ESB Networks, provided information on significant public safety incidents. This communication emphasises the importance of public safety, recognises the contribution of staff and contractors in keeping the public safe, and it continually reinforces the prioritisation of public safety actions.

We continued to implement critical public safety interventions by serving 'Notifications to Stop Work' where ESB Networks' staff became aware of unsafe work near electricity networks. During 2024, we served 203 notifications to stop work to third parties (up from 141 in 2023). Of these 203 notices, 109 were passed on to the HSA Workplace Contact Unit for further follow-up with the parties involved.

As part of our emergency response, when we were notified of low or fallen electricity wires, we continued to implement the remote disconnection of the electricity network, where appropriate, to safeguard the public. The 'Dial Before You Dig' service provided maps of the overhead and electricity networks to construction companies to support compliance with HSA Codes of Practice in relation to electricity.

The number of dangerous occurrences / third-party damages that occurred from 2020 to 2024 are outlined in the table below.

Number of dangerous occurrences/third-party damage

	2020	2021	2022	2023	2024
3rd Party plant damages (excluding underground cable dig-ins)	2,620	2,707	2,780	3,000	3,467
3rd Party plant damages caused by underground cable dig-ins	778	756	616	418	406
Non 3rd party – MV and 38kV notifiable fault incidents (line drops and reduced clearances)	132	404	344	676	982
Non 3rd party – LV notifiable fault incidents (line drops and reduced clearances)	1,012	384	383	936	1,868

6

Delivering on Price

6. Delivering on Price

Every five years (known as a 'Price Review' period), the CRU determines the revenue price control, which sets the amount of Distribution Use of System (DUoS) revenues that ESB Networks can recover through tariffs from DUoS customers. These revenues are utilised for safely operating, maintaining, and improving the distribution network.

The Price Review is a robust process where all capital and operating costs are assessed and benchmarked against peer utility companies. This ensures that costs are efficiently and effectively managed, so that the customer receives the maximum value for money.

In December 2020, the CRU published its final determination for PR5, setting the allowed revenue for ESB Networks for the five-year period (2021 to 2025), starting in January 2021.

The CRU's key strategic objectives for PR5 are:

1. facilitating a secure, low carbon future;

2. transforming the role of the DSO;

3.   increasing efficiency and protecting customers; and

4. resolving local security of supply (in the Dublin area).

The final determination provides allowances for capital and operating expenditure, totalling €5.9 billion (in 2019 prices), over the five-year period 2021 to 2025. This allows ESB Networks to provide the infrastructure needed to meet the Irish Government's CAP and the EU's Clean Energy Package. The split of ESB Networks' capital and operating expenditure across the business in 2023 and 2024 is provided in the figures below.

The determination also includes a very significant investment (€0.88 billion) in Ireland's smart metering programme.

The Price Review process facilitates annual adjustments to these revenues using the K-factor mechanism for reasons such as updated forecasts, inflation, incentive out-turns, additional unforeseen items (e.g. storms), and updates due to potential under- or over-recovery of revenue. If there is an over-recovery, meaning that the revenue recovered from customers was more than required, this is deducted from the following year's revenue allowance. Likewise, if there is an under-recovery, this is added to the next year's revenue allowance via the K-factor. The CRU approved DSO revenues of €1,181.72 million for 2024.

DUoS tariffs are the proportion of a unit of electricity which pay for distribution system development and operation. These tariffs are updated in October each year, based on changes in demand, inflation and other decisions made by the CRU. The CRU publishes an Average Unit Price (AUP) every year. The CRU's AUP is calculated by dividing the total allowed revenue by the total forecast units of electricity (measured in kWh).

While the actual tariff allocation is more complex, the AUP gives a high-level indication of network tariff movement between 'tariff periods' (i.e., a 12-month period, starting in October).

- The AUP for the 1st of October 2023 to 30th September 2024 period (first 9 months of 2024) was €4.51c/ kWh. This represents a 19.1% increase relative to the AUP for the first nine months of 2023.

- The AUP for the 1st of October 2024 to 30th September 2025 period (final 3 months of 2024) was €4.66c/kWh, a 3.3% increase relative to the AUP for the October 2023 to September 2024 period.

More detail on the allowed revenues and tariffs for 2024 is available in the CRU's decision paper, CRU2023103 'The Electricity Distribution Network Allowed Revenues for 2024 and the Distribution Use of System (DUoS) Tariffs & Distribution Loss Adjustment Factors (DLAFs) for 2023/2024'

Capital Expenditure

2023: New Business 9%, Reinforcements 20%, Generation Connections and Line Diversions 5%, Asset Replacement 26%, Response and System Control 4%, Property, Tools, Vehicles, IT and Other 14%, Smart 22%

2024: New Business 5%, Reinforcements 20%, Generation Connections and Line Diversions 6%, Asset Replacement 34%, Response and System Control 4%, Property, Tools, Vehicles, IT and Other 15%, Smart 17%

Legend:
- New Business
- Reinforcements
- Generation Connections and Line Diversions
- Asset Replacement
- Response and System Control
- Property, Tools, Vehicles, IT and Other
- Smart

Operating Expenditure

2023
- 8%
- 3%
- 21%
- 6%
- 16%
- 46%

2024
- 9%
- 4%
- 22%
- 6%
- 18%
- 61%

Legend:
- Maintaining and Renewing the Network
- Business Rates
- Telecoms and R&D
- Customer Service and Metering
- Environmental and Health & Safety
- Other

Incentives Outturn

The CRU set out the incentive arrangements for ESB Networks in the PR5 decision. The table below shows ESB Networks' performance against these incentives for 2024, and the associated reward or penalty.

Incentive	2023 DSO Incentive Outturn			2024 DSO Incentive Outturn		
	Target	Actual	Payment/ Penalty (€m)	Target	Actual	Payment/ Penalty (€m)
Customer Minutes Lost (CML)	80.8	105.592	-€10.0m	78.7	117.5	-€10.0m
Customer Interruptions (CI)	114.8	126.4	€-5.79m	112.7	137.9	-€10.0m
Customer Satisfaction (National Customer Care Centre)	90%	91.69%	€1.41m	90.00%	90.84%	€0.7m
Customer Satisfaction Survey	82%	80.10%	€-1.50m	82.50%	78.19%	-€2.7m
Smart Metering Delivery	450k-500k	464,954	€0.24m	450k-500k	325,786	€0.216m
Smart Metering Functionality		Partially completed with some deferred	€0.20m		Partially completed with some deffered	€0.45m
Smart Metering Customer Satisfaction	>80% Customer Satisfaction	96% net satisfied	€0.36m	>80% Customer Satisfaction	93% net satisfied	€0.36m
Stakeholder Engagement	10	7.6	€0.57m	10	7.61	€0.57m
Processing Generation Connection Applications	Process ECP offers 30 days before batch deadline	Completed	€1.03m	Process ECP offers 30 days before batch deadline	Completed	€3m
Worst Served Customer	>9,000	13,569 customers met the success criteria	6.70m	>9,000	11,360 customers met the success criteria	N/A
Outage Information	Balanced Scorecard	90%	€0.9m	Balanced Scorecard	97%	€0.97m
Flexibility	Balanced Scorecard	100%	€3.00m	Balanced Scorecard	95%	€2.85m
Low Voltage Network Visibility	Balanced Scorecard	84.30%	€2.53m	Balanced Scorecard	82%	€2.45m
Joint DSO/TSO Coordination	Balanced Scorecard	78.30%	€2.35m	Balanced Scorecard	92%	€2.77m
Independent Role of the DSO	Balanced Scorecard	56%	€3.12m	Balanced Scorecard	93%	€0.93m
Total			**€5.13m**			**-€7.034m**

7

Social Obligation and Engagement

7. Social Obligation and Engagement

Electric Aid

In 1987, ESB employees established ElectricAid, as an independent social justice fund run by volunteers from ESB. In 2024, it had membership of c2000 serving and retired employees, from both ESB and EirGrid, with donations matched by ESB on a 2:3 ratio up to €300K annually. As a registered charity, with its own constitution, an elected volunteer committee manages the charity, which includes employees from ESB Networks.

Since its foundation, ElectricAid has provided funding for small development projects in Ireland, as well as projects in ninety-one different countries and territories across Europe and the Developing World. In 2024, Electric Aid funded eighty-six projects across thirty-five countries, amounting to a total of €942,270.46. Each project addressed one or more of the United Nations Sustainable Development Goals (UN SDGs). The most frequently targeted UN SDGs were as follows: twenty-seven projects under Goal 3, Good Health, and Wellbeing; eighteen projects under Goal 6, Clean Water and Sanitation; 12 projects under Goal 4, Quality Education; and 5 projects under Goal 7, Affordable and Clean Energy.

ElectricAid focuses on long-term sustainable improvement and poverty relief, as well as responding to emergency appeals. The ElectricAid committee, meticulously review projects for grant funding, ensuring selected projects, address critical needs and have a lasting impact. Additionally, ElectricAid is committed to responding to emergency appeals, providing timely support where it is most needed. This dual focus on sustainable development and emergency relief underscores ElectricAid's dedication to making a meaningful difference in the lives of the most marginalised communities worldwide.

A copy of the 2023 Electric Aid Annual Report as well as Project Reports and Newsletters are available from the Electric Aid website (www.electricaid.ie).

Energy for Generation Fund

In 2024, the Energy for Generations Fund (EFG) proudly allocated €994K to support 63 grant-funded projects dedicated to advancing social inclusion. These initiatives focused on critical areas such as access to education, access to employment, and homelessness, embodying the fund's unwavering commitment to fostering a more equitable society.

Each project was meticulously aligned with seven of the United Nations Sustainable Development Goals (SDGs), with a significant portion of the funding directed towards SDG 10: Reduced Inequalities, and SDG 4: Quality Education. This strategic approach ensured that the projects not only addressed immediate needs but also contributed to long-term, sustainable development.

The EFG Volunteering Committee, comprising ten dedicated members, including representatives from ESB Networks, played a pivotal role in the fund's success. Their expertise and passion for community service were instrumental in guiding the fund's activities and ensuring that the resources were effectively utilised to maximise impact.

The Energy for Generations Fund remains steadfast in its mission to support and uplift marginalised communities.

Charitable Volunteering

Employees at ESB Networks exemplify the spirit of volunteerism and community engagement each year. Their dedication spans a wide range of activities, from volunteering for the Energy for Generations Fund (ESB's CSR Fund) and ElectricAid (ESB's staff charity), to actively participating in charitable organisations and organising fundraising events.

In recognition of their volunteerism, the Energy for Generations Fund offers a unique initiative. Employees who volunteer over 20 hours of their time or raise at least €250 for their chosen charity can apply to the Energy for Generations Fund for a grant of €250. In 2024, 18 dedicated ESB Networks staff members took advantage of this opportunity, directing a total of €5000 to charities of their choice. This initiative not only supports worthy causes but also fosters a culture of giving within ESB Networks.

To celebrate the Energy for Generations Fund's 20th Anniversary, the grant amount awarded to chosen charities will increase from €250 to €500.

School Volunteering

In the 2023/2024 academic year, 40 ESB Networks staff members participated in the "Time to Read" and "Time to Count" programmes. These initiatives aim to improve literacy and numeracy skills among second and third-class primary school children, boosting their confidence and enjoyment in learning.

The "Time to Read" programme focuses on enhancing reading skills and fostering a love for books over a 20-week period. Business in the Community Ireland partners with the Corporate Social Responsibility team to administer these programmes annually.

Inclusion and Diversity at ESB Networks

At ESB Networks, we are committed to building and sustaining an increasingly diverse workforce, reflective of society and the communities we serve, ensuring equitable experiences, and agile culture of inclusion and belonging for each of our employees. ESB Networks fosters an inclusive working environment by increasing inclusive leadership capabilities for all people managers and supporting a range of programmes which are delivered either hybrid or virtually, enabling a broader, increased participation across the business.

ESB Networks employees are active members on each of the Employee Resource Groups (ERGs) at ESB – Accessibility, Cultural Diversity & Ethnicity, Gender, LGBT+. ERGs are voluntary, employee-led groups of colleagues, working to progress diversity, equity and inclusion through employee voice, action planning and initiatives.

Stakeholder Engagement

Engagement with our external stakeholders is integral to our day-to-day operations and is at the heart of everything we do at ESB Networks. Engaging with our customers and stakeholders is crucial to how we shape the future of our business and the electricity network. It helps us develop new initiatives which benefit the communities and industries we serve, as well as improving and enhancing existing ones. It shapes our business planning and strategic priorities and informs the decision-making process. Engagement with wider industry accelerates innovation within the business and the energy sector through shared learnings and ideas.

Our Stakeholders are defined as the individuals, groups of individuals, communities or organisations that affect (or could be affected by) our activities, products or services, and associated performance. Given our central role in the electricity industry in connecting over 2.5 million homes, farms, communities, and businesses around the country, we have a very broad range of stakeholders. Since considerable changes are taking place within the energy sector at an unprecedented scale, who we engage with and how is constantly changing.

We have developed this stakeholder wheel to help us better define and categorise our broad stakeholder base.

OUR STAKEHOLDERS

- Business
  - Large users
  - SMEs
  - Media
    - Local media
    - National media
  - Academia research
    - Research bodies, think tanks etc
    - Schools and Universities
  - Supply Chain
    - Contractors
    - Technical Suppliers
  - Local government
    - Local authorities
    - State agencies
    - Other
- Communitites and representatives
  - Schools and colleges
  - Local business and enterprise groups
  - Healthcare
  - Vulnerable customer representatives
  - Community interest groups
  - Charities/NGOs
- Industry
  - Transmission System Operator
  - Gas
  - Water
  - Electricity Suppliers
  - Telecoms
  - Housing associations
  - Landowner/ farmers
- Developers and representative bodies and associations
  - Generation customers
  - Builders and developers
- Domestic customers
  - Domestic Customers
  - Vulnerable poor customers
  - Hard to reach
  - Future customers
- Emergency Services
  - Gardaí
  - Ambulance
  - Fire
  - Other
- National government and policy influencers
  - Government bodies
  - TDs
  - Regulators
  - Trade Unions

We tailor our engagement approach to our broad stakeholder base which is constantly changing given the pace of change that is taking place across the energy sector. We continually review and improve our engagement methodology as we benchmark our systems and processes against international best-in-class practice in this field.

ESB Networks recognise that engagement is essential for the successful management of our business and as a strategic priority, it is led by the senior leadership team and is seen as a vital activity at every level of the organisation. Engagement with our customers and stakeholders is now an essential part of everyone's role and it is at the heart of our operations.

Our Engagement Incentive

In 2018, the CRU introduced a new incentive for ESB Networks (as the DSO) and EirGrid (as the Transmission System Operator (TSO)) in relation to stakeholder engagement. The objective of this incentive, as stated by the CRU, is to promote cultures within the system operators that put stakeholders (i.e., customers, generators, and local communities) at the centre of what the network companies do. This ensures that the system operators deliver high quality outcomes for energy customers and the wider public.

The evaluation process requires ESB Networks to demonstrate our comprehensive, up-to-date stakeholder engagement strategy, plans, delivery channels and initiatives for engaging with stakeholders, and demonstrable positive impacts on stakeholders, stakeholder groups or the business. Each year we publish for consultation our Stakeholder Engagement Strategy and Plan for the year ahead.

In January 2024, we published our 'Stakeholder Engagement Strategy and Plan for 2024'. This set out our proposed engagement approach, priorities and planned activities for 2024, and provided our stakeholders with pathways to engage with us throughout the year.

Our corresponding outturn report for 2024 'ESB Networks Stakeholder Engagement Report 2024' was published in March 2025. This provides an overview of the extensive engagement we had with our stakeholders throughout the course of 2024. In the report we demonstrate how our engagement supports the delivery of our Networks for Net Zero Strategy targets and action plan, which we have set out to 2030.

Some of the key achievements from our external engagements in 2024 are outlined below:

Price Review 6 Submission

During 2024, we developed our Price Review 6 (PR6) Business Plan outlining our proposed investments for the period 2026 to 2030, in response to the CRU Price Review Six Strategy Paper (published in April 2024). As part of this process, we engaged extensively with stakeholders, communities and customers to understand their requirements and get feedback on our proposed investments. The process included third party research, the publication of a consultation paper outlining our investment plan approach , bilateral meetings and a stakeholder webinar, attended by representatives from 34 individual industry groups, where participants had an opportunity to ask questions.

The Business Plan was submitted to the CRU in November 2024 and was also published on our website.

Connecting Renewables

In 2024, ESB Networks undertook a range of activities to enhance stakeholder engagement relating to renewable connections. This included information webinars and customer clinics, as well as the development of online tools such as capacity heat maps, a generator cost tool and capacity workbooks. These engagements and supporting tools and processes sought to provide clarity and additional support to customers engaging with various connection processes including the Enduring Connection Policy (ECP) and the Micro, Mini and Small-Scale Generation processes. Stakeholder engagement took place at all stages of the connection journey including the pre-application, offer processing, design and energisation phases. ESB Networks also engaged in quarterly meetings with all major customers to track progress and address issues as they arose.

National Networks, Local Connections (NN,LC) Programme

The NN,LC Programme unlocks the benefits of a more flexible distribution system for our customers. In 2024, ESB Networks invited stakeholders to input to the design and development of new Demand Flexibility Products, by publishing two consultations on its Demand Flexibility Product (including two public webinars).

ESB Networks published five strategies via our call for input process in Q3 2024 seeking stakeholder input. Responses to our call for input informed the development of our Flexibility Multi-Year Plan 2025-2029. More information on these activities can be found in Section 3 of this report.

Innovation

Collaboration is central to the success of ESB Networks' innovation programme. Engaging with stakeholders ensures that projects address real-world challenges and incorporate diverse perspectives. To meet the needs of customers and support national policy objectives, including the delivery of the Climate Action Plan (CAP) targets for 2030 - we work closely with a wide range of stakeholders, including academic institutions, Government bodies, customers, industry trade associations, energy suppliers, and newer industry participants such as demand-side units and battery storage providers.

Our engagement activities extend nationally and internationally. Over the past year, we have collaborated with a wide range of industry bodies and research institutions, contributing to their programmes of work and integrating insights from other organisations into our own operations. During 2024, we hosted an 'Innovation for Net Zero' conference to enhance engagement with our innovation stakeholders and to promote opportunities for further collaboration. More information on our Innovation activities is available in Section 8 of this report.

Citizen Energy Roadshow

ESB Networks continued to collaborate with EirGrid and SEAI on the national Citizen Energy Roadshows programme in 2024. This included participation at five events around Ireland to inform communities about developments relating to flexibility, Smart Metering Programme, Distribution Markets System Operations (DMSO) and other initiatives being progressed by ESB Networks. These important stakeholder engagements demonstrate the close ongoing collaboration between Distribution System Operator (DSO) and Transmission System Operator (TSO).

National Smart Metering Programme (NSMP)

ESB Networks is leading a national programme to replace electricity meters in homes, farms and businesses with next generation smart meters. This programme is a key enabler of the Government's Climate Action Plan. By the end of 2024, nearly 1.9 million smart meters were installed. ESB Networks engaged extensively with stakeholders and customers through public information and advertising campaigns to ensure the smooth rollout of smart meters.

Campaigns to promote the benefits and opportunities for customers arising from smart meters are ongoing. Over one in five customers with a smart meter is now availing of a smart meter tariff or service. ESB Networks also led industry forums and working groups to ensure alignment with supplier system and process development and provided ongoing support for supplier queries throughout the national smart metering programme to ensure its success. More information on the National Smart Metering Programme is available in Section 9 of this report.

Network Capacity

Network capacity is the ability of the electricity network to accommodate flows of electricity to serve growing electricity needs of existing and new customers connecting to the network. Network capacity must be sufficient to meet peak system demand and address local constraints so that electricity can flow smoothly between sources of generation and demand customers at all times. Distribution network capacity is a key enabler of national policy objectives relating to housing, economic growth and climate change. As part of our ongoing collaboration and communication with our stakeholders in 2024, we published a consultation report (Electricity Distribution Network Capacity Pathways) and held a stakeholder webinar on potential measures to develop capacity. Through this process, we engaged with the TSO, local authorities, industry, and stakeholders on our plans to support electrification, connect renewables and provide capacity for new demand driven by increases in population and the growth of the economy.

To improve transparency for customers in relation to network capacity, ESB Networks developed an Availability Capacity Heatmap. This provides information on the network capacity available at all of our 3-phase LV, MV and HV DSO substations through a user-friendly, online interface. The Availability Capacity Heatmap provides indicative information on the capacity available for new demand and generation connections so that customers can easily identify potential transformer capacity in the vicinity of their development. The Heatmap was updated in Q2 and Q4 2024.

Additional transparency in relation to future network capacity was provided through the publication of Network Capacity Workbooks in 2024.

8 Innovation

8. Innovation

At ESB Networks, innovation is fundamental to delivering the electricity network needed for Ireland's clean electric future. Our Networks for Net Zero Strategy sets a clear ambition: to deliver a Net Zero ready electricity network by 2040. Innovation underpins this ambition, enabling the adoption of new solutions, improvements to customer experiences, and the delivery of a resilient, flexible, and decarbonised electricity system.

Innovation is embedded across ESB Networks. Each business unit leads innovation activities aligned to their functional responsibilities, while the central Innovation Team supports the organisation by identifying, piloting, and evaluating emerging technologies and solutions. The innovation programme is guided by four objectives: discovering new solutions, delivering breakthrough projects, disseminating learnings, and developing innovation culture and capability.

Recognising the need for collaboration, we engage widely with customers, industry, academia, start-ups, peer utilities, and community groups. Our annual Innovation Consultation 'Innovation to Deliver Networks for Net Zero' published in February this year outlines the challenges to be addressed and the proposed focus of our innovation programme for the coming years. It demonstrates our commitment to ensuring that innovation is effective, inclusive and aligned with the expectations of our customers and stakeholders who depend on us daily.

Innovation Performance Highlights 2024

ESB Networks' innovation initiatives are extensive and encompass partnerships with numerous organisations, as highlighted by the performance indicators below.

- ESB Networks continued to drive innovation momentum, assessing seventy-four innovation ideas in 2024, with two projects at an early stage of development and sixteen projects in progress. Seven of these projects were initiated and advanced in 2024. In addition, twelve innovation projects were successfully completed, with key learnings shared across our partners and stakeholders.
- Over 450 stakeholder engagements took place through webinars, conferences, publications, and bilateral meetings.
- Since the start of PR5, approximately 50 innovation projects have been progressed, with nearly 50% transitioned to Business as Usual (BAU).

74 Innovation ideas assessed	**30** Projects	**450** Engagements	**4** Publications

An external review of innovation strategy and governance was commissioned in 2024 to provide insights into industry best practice across UK Distribution Network Operators (DNOs). This work is informing the development of a revised Innovation Strategy which will be published in Q3 2025.

The range of projects in ESB Networks' innovation portfolio reflects our commitment to sustainable, resilient, and customer-focused innovation. The portfolio includes projects that directly address customer needs and leverage new technologies to improve customer experience, network efficiency and performance. These span all stages of the innovation lifecycle including: In Development, In Progress, and Completed. Details on each of the projects are available here.

Our projects are scoped and developed to ensure full alignment with our Networks for Net Zero strategic objectives and to optimise potential benefits for our customers. Examples of customer benefits arising from some of the innovation projects progressed in 2024 are outlined below:

- The Flexible Demand Connections pilot is testing the potential for customers to secure faster network connections by entering into flexible, time-bound connection agreements. This approach has the potential to enhance network efficiency and enable earlier access to network capacity in cases where customers' consumption profiles align with times when network capacity is available. The learnings from this pilot will inform the development of other forms of flexible demand connections.

- **The Plexigrid project** is exploring how a digital twin of the Low Voltage (LV) network could support more efficient network operations and planning. The technology enables ESB Networks to simulate real world network constraints and predict impact of the adoption of future low carbon technology. By enabling better forecasting of load growth and local constraints, this may enable quicker and more detailed connection assessments that will inform more targeted investment plans and facilitate faster uptake of low carbon technologies (LCT).

- **The Low Carbon Technology (LCT) Register** was developed to simplify the process of connecting low carbon technologies to the network. By establishing a list of LCT devices that are compliant with network standards, we hope to streamline connection processes for technologies such as heat pumps and electric vehicle chargers and enhance customer experience. We anticipate that the Register will reduce administrative processing time and improve transparency for customers.

- **The pilot with Advanced Infrastructure Technology Ltd** is exploring a self-serve capacity screening tool for Medium Voltage (MV) demand customers. Tools like these may enable faster high-level capacity assessments to be completed by prospective customers in advance of submitting a connection application to ESB Networks. This has the potential to deliver efficiency gains for ESB Networks and, coupled with other developments to enhance our network planning tools and processes, has the potential to deliver a faster response to new customer connection requests and growing electricity demand.

Innovation Achievements in 2024

Key improvements and achievements delivered through the innovation programme in 2024 include: .

- The Flexible Demand Connections pilot progressed considerably, and potential partners were identified and evaluated through an Expression of Interest process. This project seeks to leverage customer flexibility to facilitate and accelerate network connections for customers in capacity constrained areas.

- Significant progress was made on the Neara MV/LV pilot, an innovative trial that leverages digital twin technology and advanced machine learning to create a 3D digital representation of approximately 400 km of MV and LV network for evaluation across a range of use cases including resilience, vegetation management and data unification.

- Following extensive engagement with over 200 stakeholders, registered electrical contractors and equipment manufacturers, ESB Networks implemented the LCT Register on a pilot basis. This is a list of low carbon technologies that meet the standards required to connect to the low voltage distribution network, which aims to simplify and streamline the process of connecting LCT for our customers.

- The Plexigrid pilot continued to test use cases to improve LV data quality, optimise capital investments, reduce connection request lead times and increase hosting capacity for distributed energy resources on the LV network.

- ESB Networks continued to explore the potential of machine learning and AI to enhance asset management, using GridVision AI technology from eSmart Systems to undertake condition assessments of steel transmission towers.

- Our in-person "Innovation for Net Zero" conference brought together over 100 stakeholders and collaborators to share learnings from recent innovation projects and discuss opportunities for future collaboration.

- ESB Networks fostered knowledge exchange and collaboration with industry leaders in Ireland and globally through 450 engagements via webinars, conferences, publications and papers.

- Extensive collaboration and engagement took place with a wide range of stakeholders including community groups, the TSO, academia, international DSO's, industry, government, the CRU, and international research organisations.

- ESB Networks presented at a range of industry events including CIRED 2024 (Vienna), Enlit (Milan) and the Energy Transition Summit (Dublin).

Innovation Projects 2024

The table below provides an overview of our 2024 innovation portfolio and includes projects that were in development, in progress and completed during the year.

	Name	Impact Status	Networks for Net Zero Strategic Objective
In Development			
1.	Sustainable Backup Power Solutions	Breakthrough	Decarbonised Electricity
2.	Island Decarbonisation	Breakthrough	Decarbonised Electricity
In Progress			
1.	Plexigrid	Breakthrough	Decarbonised Electricity
2.	Development of Dynamic Line Ratings (DLR)	Incremental	Resilient Infrastructure
3.	Sidewalk Transformers	Incremental	Resilient Infrastructure
4.	Introduction of Alternatives to Creosote Wood Poles	Incremental	Resilient Infrastructure
5.	GridVision AI for Condition Assessment of Tower Corrosion	Breakthrough	Resilient Infrastructure
6.	Composite Street Light	Incremental	Empowering Customers
7.	Low Carbon Technologies Register	Incremental	Empowering Customers
8.	Neara MV/LV Pilot	Breakthrough	Resilient Infrastructure
9.	Gridguard AI -Woodpecker Mitigation	Incremental	Resilient Infrastructure
10.	Composite Core Conductors	Breakthrough	Resilient Infrastructure
11.	Flexible Demand Connections - Timed Connections	Incremental	Empowering Customers
12.	Compact 110 kV Line Design	Incremental	Resilient Infrastructure
13.	Industrial Heat Pump Network Impacts	Incremental	Empowering Customers
14.	Advanced Infrastructure Self-Serve Pilot	Incremental	Empowering Customers
15.	HV Distribution Network Development Study	Breakthrough	Resilient Infrastructure
16.	IFT (Interface Transformers) Units Refurbishment Pilot	Incremental	Decarbonised Electricity

	Name	Impact Status	Networks for Net Zero Strategic Objective
	Completed		
1.	E-fleet – Decarbonisation of the Fleet	Incremental	Empowering Customers
2.	MV Planning Assist Tool	Incremental	Empowering Customers
3.	Developing 400MHz Spectrum Use for Smart Grid Applications	Breakthrough	Resilient Infrastructure
4.	AI in Smart Metering Applications	Breakthrough	Empowering Customers
5.	Innovation Feasibility Study for Uprating of Existing 38 kV Overhead Lines to 110 kV	Breakthrough	Resilient Infrastructure
6.	CSS Voltage Quality Dashboard	Incremental	Empowering Customers
7.	International Community for Local Smart Grid	Incremental	Empowering Customers
8.	Wildlife OHL Contact Prevention	Incremental	Resilient Infrastructure
9.	AI Synthetic Analyses of 110 kV Composite Insulators	Breakthrough	Resilient Infrastructure
10.	Novel Use of Drones and AI for Line Patrolling and Fault Location	Incremental	Resilient Infrastructure
11.	Inspection of OHLs Using Drones and Image Processing Analytics	Incremental	Resilient Infrastructure
12.	Investigate Statistical Contributions from Distribution Generation: F-Factors	Incremental	Decarbonised Electricity

Future Focus: Advancing Innovation at ESB Networks

Guided by our Price Review objectives and in alignment with our Networks for Net Zero Strategy, ESB Networks is committed to ongoing innovation to deliver the electricity network for Ireland's clean electric future. Full details on our innovation portfolio are contained in this year's Innovation Annual Consultation report.

Our innovation programme is delivered against a robust framework that includes strong governance, stakeholder representation, external collaboration, knowledge sharing and horizon scanning. Through these activities, we seek to identify, assess and validate new technologies and ways of working with the potential to enhance network performance and deliver benefits to customers. We consult annually with stakeholders on our proposed programme of activities.

Innovation is an important competency in ESB Networks which is developed and nurtured through education, engagement and continuous professional development. The central innovation team is responsible for supporting innovation capacity building, and for proactively tracking new technologies and innovations that may add value for the organisation. Our horizon scanning programme includes a full spectrum of activities from online research and attendance at industry events through to bilateral meetings with peer utilities and participation in expert working groups. Through these activities, we engage with a wide range of internal and external stakeholders, including peer DSOs, academics, start-ups, suppliers and research performing organisations to share ideas and identify opportunities. This is critical to finding solutions to accelerate and enable the changes necessary for a net zero energy system.

In Q3 2025, ESB Networks will launch a new Innovation Strategy. This will draw on insights from an external review of innovation best practice among UK DNOs which we commissioned in 2024 and will be aligned with our Networks for Net Zero strategy. The new strategy will prioritise initiatives that accelerate decarbonisation, enhance network reliability and resilience, and empower customers to be active participants in the electricity system.

The new strategy will focus on deepening collaboration with a range of stakeholders including academia, start-ups and peer utilities to accelerate the energy transition and ensure that we optimise benefits for customers, now and in the future.

9

Connectivity and Digitalisation

9. Connectivity and Digitalisation

National Smart Metering Programme (NSMP)

During 2024, ESB Networks continued the NSMP. The NSMP aims to replace 2.2 million electricity meters in homes, farms and businesses with next generation smart meters by the end of 2025. This will support the transition to a low carbon electricity network as it is a key enabler of CAP, specifically regarding microgeneration and the electrification of heat and transport. We achieved the following relating to smart meters in 2024:

- The programme continued to safely install smart meters in every county in Ireland. During 2024 325,786 smart meters were installed. This brings the total number of smart meter installations to 1,894,934 by the end of December 2024. This includes 40,286 smart meter installations for microgeneration customers, bringing this total to 110,922 with smart meters. By the end of 2024, 165,968 smart day/night meters and 14,581 unused night storage heating meters were replaced by smart meters.

- ESB Networks delivered the V14.00.00 retail market release in November 2024. This release has enabled the remote switching functionality within the smart meter – one of the major benefits associated with the smart metering programme. From January 2025 Electricity Suppliers have successfully utilised the remote switch for Smart Pay As You Go and Vacant Premises De-Energisation and Re-energisation requests and almost 4,000 night storage heating meters were replaced by smart meters.

- ESB Networks is committed to ensuring that the NSMP is delivered in compliance with all applicable data privacy laws and that all customer personal data is safe and secure. We had ongoing engagement on this topic with the CRU, DCEE and Electricity Suppliers. ESB Networks fully engaged with the CRU's Smart Meter Data Access Code (SMDAC) consultation, including a number of workshops where ESB Networks' high level SMDAC proposal was considered.

Usage of the ESB Networks' Customer Online Account grew steadily in 2024. The 'My Energy Consumption' option which offers customers insight into their half hourly interval usage on their smart meter was updated in July 2024. The improvements include:

- Enhanced energy consumption and contribution charts available to a smart meter customer with the following features:

  – Introduced a Day / Night / Peak toggle to allow customers to view their consumption during different times of the day.

  – Updated the charts from line charts to bar charts for greater accuracy.

  – Modified the time period selection to specific periods (day, week, month, year) for ease of use when viewing data over a longer period.

  – Introduced total consumption and contribution values for the selected periods.

- Introduced 3 new harmonised data files (HDF) so that customers can view and analyse their data in detail to make informed decisions about their electricity usage.

  – 30-minute readings in kW

  – Daily snapshot of day/night/peak usage in actual kWh

  – Daily snapshot of total usage and export data (where applicable) in actual kWh

At the end of 2024, smart meter data for 1.9 million customers was available, with 156,453 customer accounts set up and 94,925 customers with access to their consumption data. Since it's go live there have been 647,999 visits to the 'My Energy Consumption' site and almost 297,751 HDFdownloads. By the end of 2024 several price comparison websites have the ability to utilise a customer's HDF and provide tariff options to suit the customer's usage.

- ESB Networks delivered the V13.00.00 retail market release required to support the delivery of smart services by suppliers in February 2021. By the end of 2024: 405,515 customers have availed of half-hourly interval data for smart services and tariffs; and 49,736 customers had availed of day/ night/peak standard smart tariffs.

- ESB Networks commenced remote meter reading of smart meters in February 2021. There have been over 22.1 million bi-monthly reads since go live, with 9 million of these occurring in 2024. This resulted in a significant reduction in estimated bills and improved billing accuracy for customers with smart meters. Since going live, ESB Networks has pulled over 573,000 on-demand reads from smart meters to support the change of supplier and change of legal entity retail market processes.

- ESB Networks led industry forums and working groups throughout 2024. Through this engagement we have ensured alignment with supplier system and process development and provided ongoing support for supplier queries.

- ESB Networks continues to lead the implementation of the agreed industry-wide 'Strategic Framework for Communications and Consumer Engagement'. This framework aims to support the meter deployment programme and outline the benefits of smart meters. We have included updates to programme material including more information on standard smart tariffs and data privacy. As the smart meter roll out nears conclusion it was agreed that ESB Networks collateral should be updated to focus on the benefits of a smart meter and promote how customers can access their smart meter data.

- Based on customer feedback, the smart meter upgrade section on the ESB Networks' website has been updated to include expanded FAQs, additional information on smart meter benefits, the Networks On Line Account and the remote switch functionality.

- ESB Networks has undertaken a public information campaign across local radio, press and social media channels. We've developed branding for the public to easily identify the contractors' associated with the ESB Networks' programme, created media assets and stakeholder packs and engaged with local radio stations. We have also delivered briefings to national and local stakeholders.

- Consumer surveys conducted during 2024 demonstrate that customer awareness is still high at 96%, and that sentiment towards the programme is positive. This is further supported by the average 93% customer satisfaction rating of the exchange process.

- ESB Networks won the 2024 Best Use of Technology Award at the Irish CX Impact Awards for the 'Smart Meter Upgrade Rollout'.
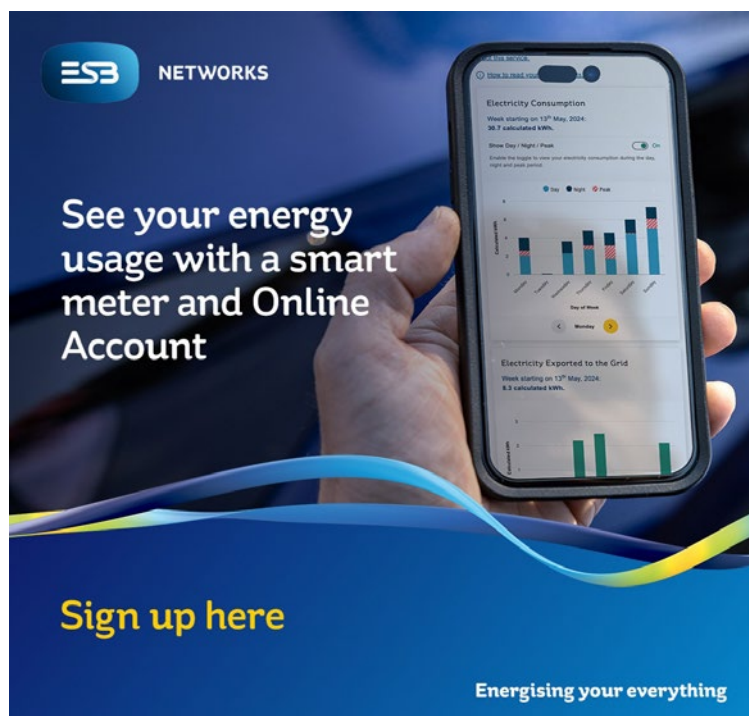
Networks Telecoms

The transmission and distribution electricity networks rely on resilient, highly available telecommunications to centrally control and operate the grid. This connectivity is provided using an extensive private telecommunications network within ESB Networks, covering a range of technologies including fibre, microwave radio, satellite, polling radio, as well as operational technology networking systems. These technologies form Ireland's largest private telecommunications network, which is managed by our 24/7 network management centre. The electricity system is developing to connect new customers and renewable energy sources. Telecommunications infrastructure deployed for these projects ensures the control centres maintain full visibility and control as the grid expands. High Voltage protection schemes also utilise the ESB Networks Telecoms infrastructure.

Resilience

The telecommunications network is designed to remain operational in challenging conditions. The network is implemented with resilience of power, diversity of routes and technologies, and cybersecurity. Evidence of this resilience was seen in the high up-time of the Telecommunications networks during the 2024 winter storms.

Operation Technology

ESB Networks Telecoms is modernising its telecommunications systems in line with our 2022 Technology Strategy. In 2024, ESB Networks Telecoms has continued to develop and deploy an advanced operational telecommunications network to meet the growing needs of the grid. This is becoming increasingly important as the need for greater system flexibility grows. The deployment of high-capacity fibre connectivity, next generation active equipment, and a highly resilient core network architecture has been a key area of focus.

Private Long Term Evolution (P-LTE)

ESB Networks is developing a private, resilient LTE network utilising spectrum awarded by ComReg. Deployment of the network core progressed well across 2024. The first base stations were delivered in four locations. Deployment of enhanced backhaul connectivity and supporting infrastructure has progressed to ensure this critical network will be resilient. Build-out of the network will continue into 2027; the network will go-live in 2025 with a sub-set of the total base-stations.

Retail Market Services

ESB Networks' Retail Market Services team provides meter and data services to the electricity market and serves all 2.5 million electricity customers and their registered suppliers.

In 2024, as part of phase 2 of the NSMP, Retail Market Services enabled an increasing number of smart meters and have facilitated the introduction of additional retail market functionality. Retail Market Services also continue to support the Interim Retail Market Microgeneration solution with growth of an average of approximately 700 customers each week. During 2024, Retail Market Services have also invested time in exploring the transformative regulatory driven changes that are expected to gain increased focus in 2025 and the coming years.

Electricity Costs Emergency Benefit Scheme

The Irish Government introduced the first Electricity Costs Emergency Benefit Scheme in winter 2021 to support domestic electricity customers with the exceptional increase in global energy prices. A second scheme was announced as part of a range of Budget 2023 measures. The associated legislation obliged both ESB Networks and electricity suppliers to operate and administer the scheme. During 2024, ESB Networks facilitated an additional two schemes. Scheme III saw three payments of €150 administered to each eligible domestic customer over the course of Winter 2023/2024. Scheme IV saw two payments of €125 administered in Winter 2024/2025. To date approximately €3 billion has been passed to customers through the four schemes.

10

Service Level Agreements

10. Service Level Agreements (SLA)

The Service Level Agreement (SLA) Report in the following table contain the complete set of results for 2024 The report provides a description of each SLA and the measure against which its level of performance is reported. The actual performance is measured as the percentage of transactions that were completed within the agreed SLA timeline and the percentage completed within twice the SLA timeline during 2024.

Description	No.	Standard Approval Timelines (SLA)	Within SLA Timeline	Within twice SLA Timeline
Change of Supplier (NQH)	1A	Validate within 5 days	99.97%	100%
	1B	Using customer read supplied by the customer– Complete within 3 days	99.92%	100%
	1B	Using a special read organised between the customer and ESB Networks– Complete within 10 days	98.80%	100%
	1B	Using one of ESB Networks scheduled reads – Complete within 3 days	99.75%	100%
Change of Supplier (QH)	2A	Validate within 5 days	99.51%	100%
	2B	Complete within 3 days	98.57%	100%
Change of Supplier Cancellation	3A	Validate supplier cancellation within 5 days	99.98%	100%
	3B	Complete supplier cancellation within 5 days	99.84%	100%
New Connection and registration with supplier (NQH)	5C	Data Processing – Issue details to Supplier within 10 days	99.53%	99.79%
New Connection and registration with supplier (QH)	6C	Data Processing – Issue details to Supplier within 10 days	78.38%	91.89%

Description	No.	Standard Approval Timelines (SLA)	Within SLA Timeline	Within twice SLA Timeline
Change to meter point characteristics	8C	Process Change – Issue details to Supplier within 10 days	96.39%	98.77%
De-energisation of meter point	9A	De-energise of meter point within 5 days	93.08%	96.04%
	9B	Issue Meter details to Supplier within 10 days	99.36%	99.61%
Re-energisation of meter point	10A	Re-energise meter point within 5 days	98.47%	99.19%
	10B	Issue Meter details to Supplier within 10 days	98.89%	99.57%
Change of meter configuration	11A	Reconfigure meter within 5 days after the receipt and validation of Supplier request	94.29%	96.88%
	11B	Process data within 10 days	98.80%	99.40%
Meter problems and reports of damage	12A	Repair or replace faulty meter within 5 days	68.26%	75.35%
	12B	When a faulty meter is repaired or replaced – process meter data within 5 days	98.55%	99.03%
NQH Meter Reading	14A	Scheduled Read – Distribution of Reads to Suppliers within 7 workdays	99.81%	99.93%
	14A	2 Scheduled reading visits per annum	98.05%	NA
	14A	4 Scheduled reading visits per annum	93.66%	NA
	14A	Actual reads for scheduled meter reading visit	91.48%	NA
	14A	Actual reads for scheduled MD meter reads	83.00%	NA
	14A	One actual read per annum	97.06%	NA
	14B	No Consecutive Block Estimations	99.61%	NA
	14B	No Consecutive MD Block Estimations	100%	NA
	14C	Out of Cycle Customer Read – Readings processed within 3 workdays	97.82%	98.43%

Description	No.	Standard Approval Timelines (SLA)	Within SLA Timeline	Within twice SLA Timeline
QH Data Collection	15A	D+4 QH data-	100%	NA
		Send to SEM-O / Suppliers in 1 workday		
	15B	QH Actual Data. Send to suppliers within 4 and 10 days**	95.88%	96.65%
Request for Special Read	18A	Site visit by 7 days	72.69%	77.62%
	18B	Issue of Meter details within 3 Days	70.98%	74.36%
Data Aggregation	16	Issue of aggregated data to SEM-O/ TSO/Suppliers and Generators within 5 workdays	100%	NA
Change of SSAC	20	Complete process in 3 workdays	100%	NA
De-registration	21	Auto Completion within 5 workdays	100%	NA
		Manual Completion within 10 workdays	100%	NA
Change Customer Details	24	Complete within 5 days	99.96%	100%
Change Legal Entity	25	Complete within 5 days	99.13%	99.23%

11 Register of Assets

11. Register of Assets

The following table is a register of all relevant distribution system assets at the end of 2024.

Register of Distribution System Assets at end of 2024

Asset	Units	Volume
220kV		
220kV Substations	Sub	3
220/110kV Transformer Capacity	MVA (Installed Capacity)	2,250
110kV		
110kV Overhead Lines	Km	386
110kV Underground Cable	Km	224
110kV Switching Substations	Sub	13
110kV Substations	Sub	
110/38/MV Substations	Sub	123
110kV/MV Substations	Sub	
110/38kV Transformer Capacity	MVA (Installed Capacity)	8,625
110kV/MV Transformer Capacity	MVA (Installed Capacity)	2,464
38kV		
38kV Overhead Lines	Km	5,615
38kV Underground Cable	Km	1,304
38kV Substations	Sub.	418
38kV Transformer Capacity	MVA (Installed Capacity)	6,264
MV		
20kV 3-ph Overhead Lines	Km	16,060
20kV 1-ph Overhead Lines	Km	32,622
10kV 3-ph Overhead Lines	Km	13,116
10kV 1-ph Overhead Lines	Km	23,301
20kV Underground Cable	Km	2,152
10kV Underground Cable	Km	8,884
3-ph Pole mounted Transformers	Trafo	23,202
1-ph Pole mounted Transformers	Trafo	230,423
MV Ground Mounted Substations	Sub	24,354
LV		
LV 3-ph Overhead Lines	Km	4,869
LV 1-ph Overhead Lines	Km	58,008
LV Underground Cable	Km	15,863
Mini-Pillars	MP	187,527