ESB NETWORKS

Innovation 2026
Innovation To Deliver Networks For Net Zero

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Foreword

Ireland's electricity network is central to enabling population growth, economic development and the transition to a clean electric future. As more customers depend on electricity for heat, transport and daily life, the electricity distribution network must be reliable, resilient and flexible. The continued expansion of renewable generation, low-carbon technologies and digital services will place new and more complex demands on the system. Ensuring that the network can accommodate this change in a secure, affordable and efficient manner is a national priority.

ESB Networks has set a clear direction of travel through our Networks for Net Zero strategy which outlines our commitment to achieving a Net Zero-ready electricity network by 2040, based on three strategic pillars: decarbonised electricity, resilient infrastructure and empowered customers. Innovation is integral to each of these objectives. It enables us to trial and scale new approaches, strengthen our operational performance and support customers as they adopt low-carbon technologies. Our new Innovation Strategy, which was published in September 2025, sets out our approach to managing innovation in ESB Networks to optimise value for customers and accelerate change.

Innovation in ESB Networks extends beyond the introduction of new technologies. It encompasses the governance, processes and culture required to deliver change with confidence. Over recent years we have strengthened our innovation structures, adapting our governance processes, establishing a balanced portfolio of innovation projects and deepening collaboration across the energy ecosystem. Our engagement with utilities, start-ups and research institutions ensures that we remain connected to global best practice while addressing the specific needs of the Irish system.

This consultation presents our innovation focus for 2026 and provides an overview of the projects in development, in progress and completed in the past year. It highlights how our work aligns with the Networks for Net Zero strategy and how digitalisation, data and new business models are being applied to enhance capacity, resilience and customer experience. It also reflects our commitment to collaboration, dissemination and transitioning proven pilots into business-as-usual activities.

We recognise that the transition to a Net Zero-ready electricity network cannot be achieved on our own. Insights from customers, industry colleagues, suppliers, communities, policymakers and the research sector are essential in shaping an innovation programme that is relevant, ambitious and impactful. We invite you to review this document and share your perspectives through the accompanying questionnaire. Your feedback will help us to refine our priorities, strengthen collaboration and ensure that our innovation activities continue to deliver value for the energy system and for society.

Nicholas Tarrant
Managing Director, ESB Networks

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1. Innovation In ESB Networks

1.1 ESB Networks – Who We Are

ESB Networks has a key role in enabling Ireland's transition to a clean energy future. As the electricity distribution system operator (DSO), distribution asset owner (DAO) and onshore transmission asset owner (TAO), licensed by the Commission for Regulation of Utilities (CRU), we are responsible for developing, operating and maintaining the electricity distribution system that supports the daily lives of more than 2.5 million customers and their families.

Our network spans over 160,000 km of overhead lines, 28,000 km of underground cables and more than 800 high-voltage substations. For almost a century, we have worked to ensure that customers can rely on a resilient and affordable electricity supply. Today, this responsibility includes supporting Ireland's increasing dependence on electricity for heat, transport, digital services and industrial activity.

We work closely with customers and stakeholders across Ireland to ensure that the electricity network continues to evolve in a way that supports economic growth, new technology adoption and a secure, sustainable future.

Our Values

Each of us is prepared to challenge the way we've always done things, stand up for what we feel is right and try better ways of working.

We're putting customers' current and future needs at the heart of what we do and we keep ourselves and others safe and healthy.

We bring passion and persistence to what we do every day, innovating and collaborating to meet the challenges and opportunities ahead.

We each play our part, taking ownership of our responsibilities, seeing the job through and protecting our own health and safety, as well as others'.

1.2 Our Networks for Net Zero Strategy

In 2023, ESB Networks published Networks for Net Zero setting out our strategy to deliver a net zero-ready electricity network by 2040. The strategy outlines the system wide changes required to enable Ireland's decarbonisation objectives and identifies three strategic pillars that guide all areas of our work:

Decarbonised Electricity

Connecting and facilitating renewable generation, supporting flexibility and reducing carbon emissions across our own operations.

Resilient Infrastructure

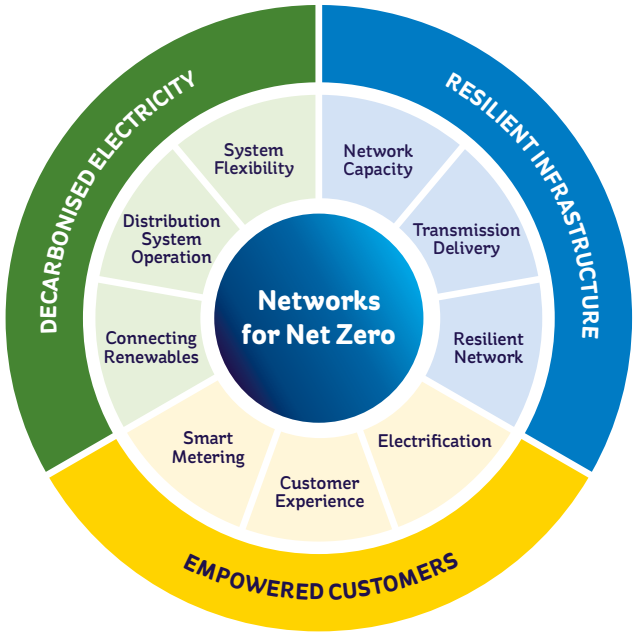
Building and maintaining a network that is robust, reliable and adaptable to changing climate and customer demands.

Empowered Customers

Enabling all customers to actively participate in the energy transition through improved data, services and accessibility.

This strategy is supported by four foundational capabilities: our people, our digital and data capability, our financial strength, and our commitment to sustainability and social responsibility. Together these provide the organisational foundation needed to deliver the long-term transformation of the electricity system.

Our innovation programme is aligned with these strategic pillars focusing on solutions that help the network respond to emerging needs and support national climate and housing policy objectives.



1.3 Driving Innovation at ESB Networks

Ireland's energy system is undergoing rapid transformation, driven by electrification, digitalisation and increasing renewable generation. Innovation enables ESB Networks to respond effectively to these changes by trialling and scaling new technologies, processes and approaches that improve performance across the network.

Our innovation programme supports the delivery of our Networks for Net Zero strategy by focusing on solutions that enhance network capacity and resilience, optimise the use of renewable generation and empower customers.

Since the beginning of 2021, over 50 innovation projects have been progressed, with many now integrated into Business as Usual (BAU) operations. These projects have demonstrated the tangible impact of innovation, improving safety, accelerating electrification, advancing digital capability, digitising solutions and services for our customers, and delivering efficiencies across the network.

We work closely with colleagues across the organisation and engage with utilities, start-ups, research institutions and industry partners to ensure we remain connected to emerging ideas and best practice internationally. This approach ensures that ESB Networks continues to identify solutions suited to the unique characteristics of the Irish electricity system.

In 2025

115
Innovation ideas assessed

38
Projects

450
Engagements

1.4 Innovation Strategy and Governance

Effective governance remains central to how ESB Networks delivers innovation. Our structures ensure that projects are strategically aligned, well managed and positioned to deliver lasting value for customers, stakeholders and the wider energy system.

Innovation across ESB Networks is delivered through a balanced portfolio that combines incremental change, emerging opportunities adjacent to the core business and breakthrough advances in technology and business practices. This portfolio approach ensures that near-term opportunities are pursued alongside longer-term, higher-impact projects, maintaining the right balance of risk and benefit across our innovation activity.

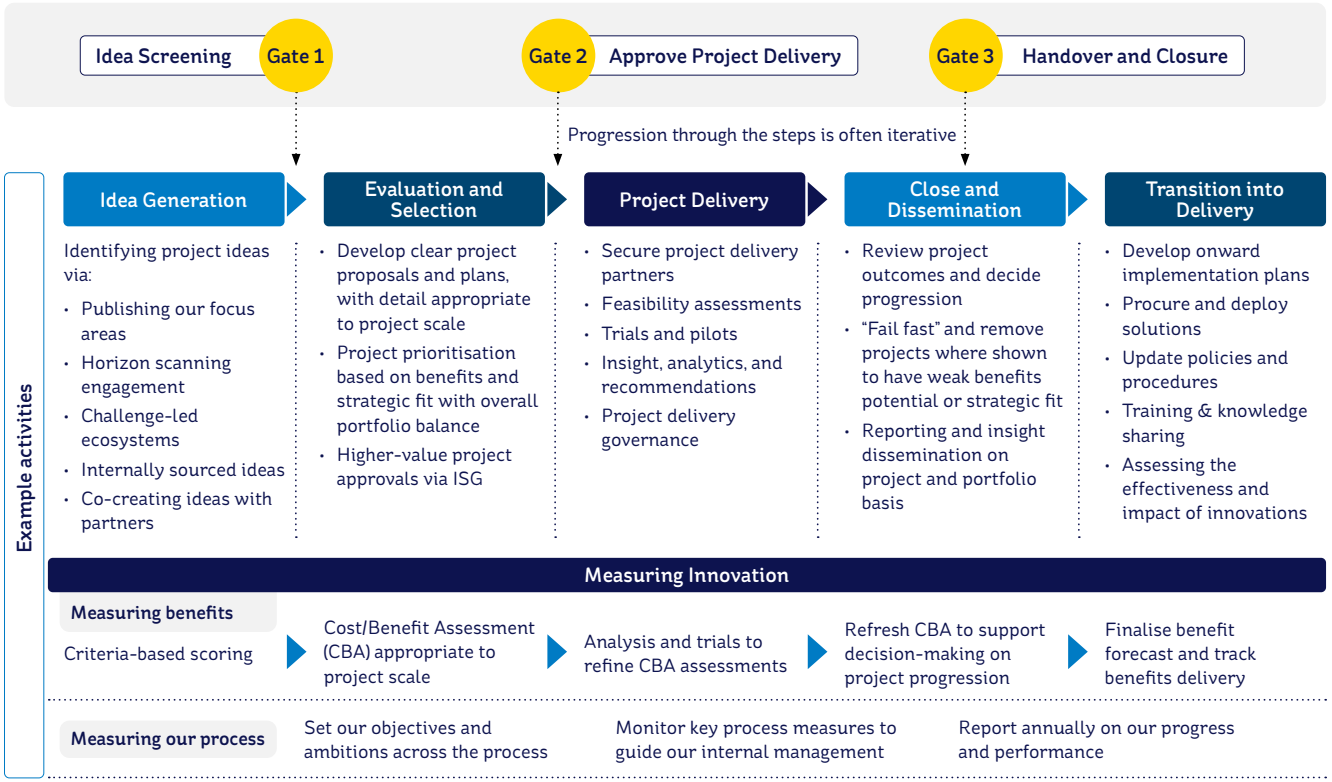
Oversight is provided by the Innovation Steering Group (ISG), which brings together senior leaders from across the business. The ISG ensures proposals are assessed based on their strategic fit, potential impact and customer value, and endorses projects for progression through a stage-gate process.

This structured framework ensures transparency and consistency in decision-making, avoiding duplication with other projects across the organisation, while enabling flexibility and responsiveness as new challenges and opportunities emerge.

Our Innovation Strategy, published in 2025, provides a clear framework for identifying, delivering and embedding innovation. It reinforces collaboration, accountability and knowledge-sharing as core principles, ensuring that innovation is seamlessly integrated into how we plan, build and operate the network.

Together, these arrangements provide a strong foundation for delivering innovation that is purposeful, well-governed and aligned with our Networks for Net Zero ambition.

Stage Gates in Innovation Governance Process



1.5 Looking Ahead

In 2026, ESB Networks will embark on our largest ever investment programme under Price Review 6 (PR6). As we ramp up to deliver infrastructure at a much higher pace and scale to meet Ireland's energy needs, innovation will be key to overcoming challenges, improving efficiency and driving transformative change.

Our priorities for the period ahead include:

Delivering outcomes that matter
Ensuring innovation strengthens network resilience, capacity delivery and customer empowerment.

Embedding innovation across the business
Integrating learnings, tools and process improvements into core activities to support consistent and effective delivery.

Strengthening partnerships
Deepening engagement with peer utilities, academia, industry and communities to address shared challenges.

Advancing digital and data capability
Expanding the use of advanced analytics, AI and digital twins to optimise network planning and enhance network resilience and reliability.

Fostering a culture of innovation
Empowering people at every level of the organisation to identify opportunities and progress new ideas.

By applying insight, fostering a collaborative approach, and maintaining strong governance, ESB Networks will continue to deliver innovative solutions that support Ireland's transition to a clean electric future and provide long term value for customers and society.

2. 2026 Objectives

We have aligned our innovation activity for 2026 to the strategic pillars outlined in the Networks for Net Zero strategy. Our focus areas support resilient infrastructure, decarbonised electricity and customer empowerment and will focus on the themes below.

Resilient Infrastructure

Delivering Network Capacity
We are seeking solutions that will enhance and accelerate project delivery through standardisation, modularisation, the application of optimised processes and learnings from other jurisdictions.

Network Reliability
We are seeking solutions that will improve the reliability of the network through faster fault identification and restoration, and by enabling us to identify and influence the operation of low carbon generation and loads across the network.

Network Resilience and Safety
We are seeking solutions that will enhance the resilience of our network and mitigate risks to our assets, including those related to storms, flooding, wildlife interference, and cyber security, all the while keeping the public and our personnel safe.

Decarbonised Electricity

Flexibility
We are seeking to develop open markets and offer new products and services that unlock system capacity and maximise the efficiency of the network, in support of constraint management and accelerating connections. We will also optimise and leverage smart meters to transform our operations.

Whole Energy System Engagement
We are seeking solutions that will enable greater transparency of electrification plans across utility organisations and local authorities. We will also explore and socialise technology solutions that support electrification with reduced societal impact.

Net Zero Network
We are seeking to decarbonise our own operations, reducing losses, and embedding circularity, biodiversity, and regeneration across our sites. We will also explore new technologies to decarbonise networks such as storage and enable the use of low carbon fuels in the energy system.

Empowered Customers

Vulnerable Customers
We are seeking to explore innovations that unlock customer insights and influence policy, while enabling fair access to low carbon technologies, ensuring no one is left behind in the energy transition.

Enabling Electrification
We are seeking solutions that address barriers and deliver the customer experience needed to promote the uptake of low carbon technologies which support the electrification of heat, transport, and industry.

Self-Serve Solutions
We are seeking to enhance services for our customers by developing digital self-serve solutions that leverage accessible data and meet their requirements, helping them to transition towards low carbon in an informed and safe manner.

Digital, Data and Artificial Intelligence (AI)
We are seeking to enable customer-focused solutions, using an open and shared data approach and leveraging solutions, such as digital twin technologies and Augmented and Virtual Reality (AR/VR), to drive smarter decisions, enable automation, improve customer experience, and unlock value across the energy system.

3. Innovation Portfolio

3.1 Projects Overview

ESB Networks' innovation portfolio focuses on delivering solutions aligned with our three strategic objectives and includes projects at various stages in the innovation lifecycle classified, for simplicity, as being: In Development, In Progress, and Completed.

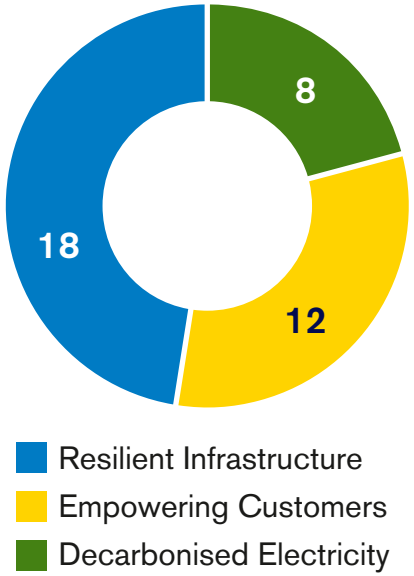
Projects in the "In Development" stage are being conceptualised, evaluated and planned. "In Progress" projects are actively being implemented, transforming ideas into tangible outcomes. "Completed" projects from 2025 showcase our achievements and the benefits of our innovation efforts.

Details on each of the projects are available in the appendix document here.

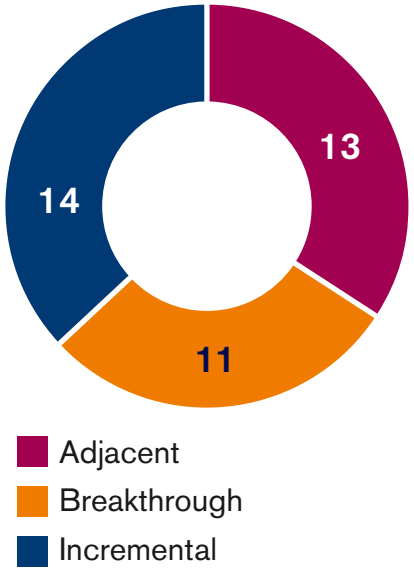
We invite stakeholders to review our portfolio and share their thoughts on our projects. Your perspective helps us ensure our innovation efforts continue to deliver solutions that meet customer and stakeholder needs.

The following sections provide a breakdown of the number and classification of innovation projects and spotlight a selection.

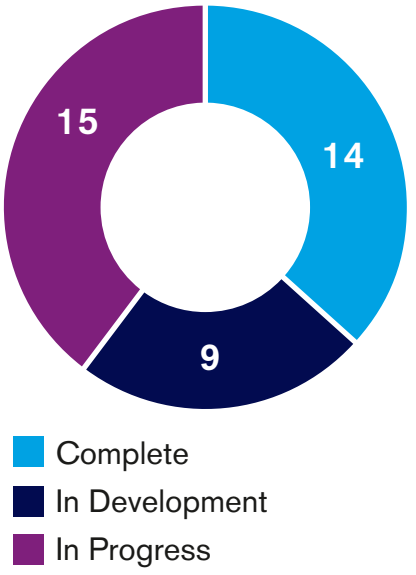
Networks for Net Zero Strategic Objective



Impact Status



Project Status



The following table provides an overview of ESB Networks' innovation project portfolio, categorising projects by their stage of development, the degree of innovation from incremental to adjacent to breakthrough, and their alignment with the strategic objectives in our Networks for Net Zero strategy.

	Name	Horizon	Strategic Alignment
In Development			
1.	69 kVA pilot	Incremental	Empowered Customers
2.	AR/VR Fire Safety Training Pilot	Adjacent	Decarbonised Electricity
3.	Assetcool	Breakthrough	Decarbonised Electricity
4.	Battery Co location pilot	Incremental	Decarbonised Electricity
5.	ElectriCITY	Breakthrough	Empowered Customers
6.	Emergency Low Earth Orbit (LEO) Sat Communications	Incremental	Resilient Infrastructure
7.	Smart Fault Passage Indicators for Substations	Incremental	Resilient Infrastructure
8.	Tower Jacking Initiative	Breakthrough	Resilient Infrastructure
9.	Third Equation	Breakthrough	Resilient Infrastructure

	Name	Horizon	Strategic Alignment
In Progress			
1.	300 kVA pilot	Incremental	Empowered Customers
2.	Compact 110 kV Line Design	Incremental	Resilient Infrastructure
3.	Composite Core Conductors	Breakthrough	Resilient Infrastructure
4.	Composite Cross Arm	Incremental	Resilient Infrastructure
5.	Composite Street Light	Adjacent	Empowered Customers
6.	Development of Dynamic Line Ratings (DLR)	Incremental	Resilient Infrastructure
7.	Flexible Demand Connections - Timed Connections	Adjacent	Empowered Customers
8.	Gridguard AI - Woodpecker Mitigation	Adjacent	Resilient Infrastructure
9.	GridWrap	Breakthrough	Resilient Infrastructure
10.	HV Distribution Network Development Study	Incremental	Resilient Infrastructure
11.	Looped Services Identification Using AI	Adjacent	Empowered Customers
12.	Portable Overhead line Fault Passage Indicators	Incremental	Empowered Customers
13.	Prezerv	Breakthrough	Resilient Infrastructure
14.	Sidewalk Transformers	Adjacent	Resilient Infrastructure
15.	Zero Parallax	Adjacent	Resilient Infrastructure

	Name	Horizon	Strategic Alignment
Completed			
1.	Advanced Infrastructure Self-Serve Pilot	Adjacent	Empowered Customers
2.	GridVision AI for Condition Assessment of Tower Corrosion	Adjacent	Resilient Infrastructure
3.	IFT (Interface Transformers) Units Refurbishment Pilot	Incremental	Decarbonised Electricity
4.	Industrial Heat Pump Network Impacts	Incremental	Empowered Customers
5.	Introduction of Alternatives to Creosote Wood Poles	Incremental	Resilient Infrastructure
6.	Island Decarbonisation	Breakthrough	Decarbonised Electricity
7.	Linebird	Breakthrough	Resilient Infrastructure
8.	Low Carbon Technologies Register	Incremental	Empowered Customers
9.	Neara MV/LV Pilot	Adjacent	Resilient Infrastructure
10.	Plexigrid	Adjacent	Decarbonised Electricity
11.	PortaSCAN Pilot	Breakthrough	Resilient Infrastructure
12.	Rooftop PV identifier	Adjacent	Decarbonised Electricity
13.	Sustainable Backup Power Solutions	Breakthrough	Decarbonised Electricity
14.	VisNet Design Pilot	Adjacent	Empowered Customers

3.2 **Spotlight 1:** Linebird

Pilot Overview

As part of our innovation commitment to network reliability and operational excellence, the Linebird pilot explored the use of UAV-deployed tools for live-line maintenance and condition assessment, offering a safer, more efficient alternative to traditional methods.

Linebird's technology enables live-line maintenance operations using a heavy-lift Unmanned Aerial Vehicle (UAV). The toolkit includes a grabber for removing debris from overhead lines, a cutter for remotely severing lines, and the Ohmstik Plus, an aerial ohmmeter that measures joint resistance without requiring outages. This approach minimizes the need for network shutdowns, improving safety and enabling more effective asset management.

Why it Matters

The Linebird toolkit enables ESB Networks to perform live-line work without outages or the need for lifting equipment. It enhances crew safety, particularly during storm damage scenarios, while reducing operational disruption and resource requirements. In addition, the technology supports forward planning through condition-based assessments, helping improve overall network reliability and efficiency.

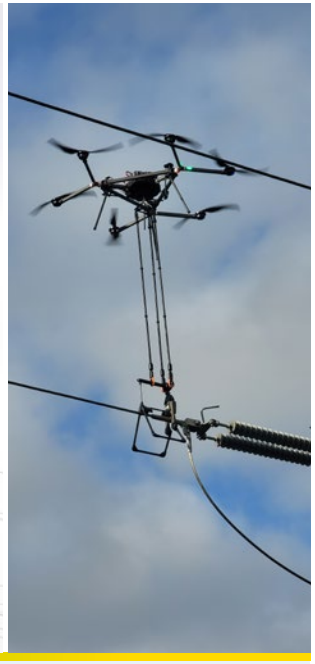
Pilot Progress and Next Steps

A three-day trial was carried out in collaboration with Cyberhawk (drone operator). The programme included training at ESB Networks' National Training Centre (NTC), live testing on the Cushaling–Portlaoise 110 kV line, and additional demonstrations at the NTC.

The pilot validated the toolkit's effectiveness and produced operational learnings to inform future deployments. This pilot supports ESB Networks' broader innovation strategy and aligns with national goals for safety, resilience, and sustainability.

The Bigger Picture

By adopting advanced technologies like UAV-based maintenance and operations, ESB Networks is paving the way for smarter, more flexible approaches to network management, supporting safer and smarter network maintenance and contributing to Ireland's energy transition and net zero ambitions.



3.3 **Spotlight 2:** Prezerv

Pilot Overview

Prezerv is a US-based top 15 finalist in the 2025 Free Electrons programme. Its AI assisted cloud point processing technology for ground penetrating radar (GPR) provides 2D and 3D visualisations of underground assets with greater speed, precision and accuracy than traditional technologies.

Ground penetrating radar is an existing technology which uses radar scanning to detect objects underground such as pipes, cables and other utilities.

Why it Matters

Prezerv's new AI assisted processing techniques enable us to see our underground assets with greater detail and accuracy than before. This could help us pinpoint locations for new cable routes, reduce the scale of exploratory digging and limit the risk of cable strikes.

Pilot Progress and Next Steps

ESB Networks and Prezerv have designed a trial of Prezerv's technology that will see multiple sites in Dublin City and county Meath undergo GPR scanning followed by data analysis, to test the capabilities of the technology against different use cases and under different scenarios.

The trial will provide insight into how the Prezerv scanning and analysis process operates, as well as experience of and insights into the benefits of the 2D and 3D visualisation formats.

The use cases to be tested are of high importance to operational, engineering, environmental and planning teams and include earth grid mapping of HV substations, analysis of congested cable routes and pre- and post-construction surveys.

The surveying is scheduled to take place over the course of one week before end January 2026. Once the surveying is complete, the collected data will be post-processed, and 2D and 3D visualisations will be delivered to ESB Networks on a phased basis, with final outputs expected before the end of March 2026.

The Bigger Picture

Prezerv's technology may enable faster and more accurate identification of underground assets than technologies and processes in use today. This initiative aligns with ESB's strategic objective of having a resilient network capable of delivering increased capacity and reliability for customers.

3.4 **Spotlight 3:** Sustainable Backup Power Solutions

Pilot Overview

ESB Networks is actively investing in the testing and deployment of cutting-edge solutions to enhance grid resilience and support decarbonisation.

We have recently completed a proof-of-concept (PoC) pilot with Allye Energy, a top 15 start-up in the 2024 Free Electrons programme. Allye's mobile Battery Energy Storage System (BESS) offers a sustainable alternative to diesel generators, delivering high-power, silent, and resilient backup energy for off-grid, on-grid, and grid-constrained sites.

Why it Matters

As extreme weather events become more frequent, the need for resilient energy infrastructure has never been greater. Innovative technologies such as BESS can play a key role in providing resilience during storm events by providing clean and reliable backup power. This technology can disrupt traditional solutions and accelerate the transition to net zero by reducing reliance on fossil fuel-based standby generators.

Pilot Progress and Next Steps

In 2025, ESB Networks tested the 300 kWh mobile BESS solution at its National Training Centre (NTC) in Portlaoise. This trial provided an opportunity to assess Allye's solution under simulated real-world conditions. ESB Networks also completed a mobile BESS trial with Power2 (Energy Storage Solution Provider), which focused on understanding system behaviour under realistic grid conditions. Testing included operation with unbalanced single-phase loads and three phase motor loads, allowing engineers to assess performance during energisation, varying demand and typical customer scenarios.

Key areas evaluated included synchronisation with the live grid, smooth transition to island mode, controlled load transfer and peak shaving operation. Simulated grid faults were also introduced to examine protection coordination and ensure the unit's stability during abnormal system events.

The Bigger Picture

Together, these completed trials provide a strong evidence base for how mobile storage technologies can enhance resilience, support operational activities and offer low carbon alternatives to traditional standby generation. This work positions ESB Networks to safely and effectively deploy mobile BESS solutions as part of its Networks for Net Zero Strategy.

3.5 **Spotlight 4:** Low Carbon Technology (LCT) Register

Pilot Overview

The LCT Register is a dynamic list of devices that meet those industry standards required to connect to the electricity network. Launched in January 2025, there are now over 1,500 LCT devices registered including generation inverters, heat pumps, electric vehicle chargers and export limiting devices, with additional LCTs being added monthly.

ESB Networks has appointed an LCT Compliance Agency which continues to liaise with LCT Manufacturers to support registration of additional devices.

Why it Matters

The LCT Register reduces administration for customers and ESB Networks as, by choosing to install an LCT device that is on the Register, it eliminates the need for customers to provide supporting documentation such as Type Test Reports or Type Test Certificates as part of their application. Customers simply inform ESB Networks of the LCT reference number of their chosen inverter or export limiting device. The benefit of the LCT Register is already being realised by those applying to connect Mini-Gen and Small-Scale Generation onto the network.

Pilot Progress and Next Steps

Changes to the design of the microgeneration application form in 2026 will extend this benefit to a wider group of applicants.

The Bigger Picture

By customers only installing LCT devices listed on the LCT Register, this will ensure compliance with connection standards for these LCTs which will help to improve the overall safety of the network.

Currently, there is no process in place for customers to notify ESB Networks of their intention to install LCT demand devices such as heat pumps and electric vehicle chargers, the LCT Register does however identify those devices that meet the standards ESB Networks requires to permit them be installed on the network.

3.6 **Spotlight 5:** Interface Transformer (IFT) Units Refurbishment Pilot

Pilot Overview

ESB Networks piloted an innovative approach to extend the life of Interface Transformer (IFT) units through refurbishment and automation. This initiative reflects ESB Networks' commitment to sustainability and the circular economy by reducing waste, reusing materials, and minimising the need for new equipment procurement.

The pilot focuses on refurbishing existing IFT units to enhance their functionality and extend their operational lifespan. Each unit undergoes a comprehensive upgrade process that includes stripping down, degreasing, cleaning, and repainting; installing a new zinc-coated floor and brackets to support reclosers and controllers; and fitting a new control panel with a protection relay to enable full automation of the IFT. A dedicated refurbishment workshop has been established to support the 20 kV project team and to develop a repeatable process for future upgrades.

Why it Matters

This project is important because it delivers multiple benefits. It significantly reduces waste and carbon footprint through recycling and reuse, achieves substantial cost savings compared to purchasing new IFT units, and shortens lead times relative to new equipment procurement. Additionally, it aligns with ESB Networks' sustainability goals by supporting a circular economy and extending asset life.

Pilot Progress and Next Steps

The refurbishment process has been successfully trialled, demonstrating the feasibility of upgrading and automating IFT units. The next step is to formalise this process and transition it to Business-as-Usual (BAU), applying lessons learned to other electrical assets across the network.

The Bigger Picture

The IFT refurbishment pilot illustrates ESB Networks' proactive approach to sustainability and innovation. By extending asset life and reducing waste, this project supports Ireland's transition to a low-carbon future while delivering operational and financial efficiencies. Importantly, the initiative aligns with ESB Networks' PR6 objectives by driving cost-effective solutions, enhancing network resilience, and contributing to our regulatory commitments on sustainability and innovation.

3.7 **Spotlight 6:** 300 kVA Connection Pilot

Pilot Overview

Traditionally a single customer could receive up to a 200 kVA connection from a prefabricated unit sub-station. ESB Networks is piloting a new approach to deliver high-capacity individual connections of up to 300 kVA using unit substations. This pilot now enables individual customers to avail of up to a 300 kVA connection without the necessity to construct a block-built substation.

This initiative addresses space, cost, and planning challenges faced by customers, particularly EV Charge Point Operators (CPOs) and supports Ireland's electrification goals by accelerating infrastructure delivery. Currently, customers requiring more than 200 kVA must connect via block-built substations, which are expensive, time-consuming, and require planning permission. The pilot introduces a prefabricated unit substation design with a smaller footprint, enabling faster installation, reduced costs, and eliminating planning delays.

The scope includes sourcing and testing materials to support a 300 kVA supply and running three pilot projects to assess compatibility with existing infrastructure, technical performance, and commercial implications. Stakeholder engagement has been central, with strong buy-in from EV CPOs and ZEVI.

Why it Matters

This solution could transform high-capacity connections by accelerating EV infrastructure deployment, reducing costs, and optimising land use, supporting Ireland's sustainability targets.

Pilot Progress and Next Steps

The pilot will increase LV capacity to 300 kVA in confined locations and shorten connection timelines. Key outputs include energising three pilot sites and developing a new procedure for 200–300 kVA connections. Next steps involve energising two additional sites, monitoring installations for six months, and finalising procedures for transition to Business-as-Usual (BAU).

The Bigger Picture

The 300 kVA Connection Pilot exemplifies ESB Networks' commitment to innovation and sustainability by simplifying high-capacity connections, accelerating EV infrastructure rollout, and supporting Ireland's low-carbon future in line with PR6 objectives.

3.8 **Spotlight 7:** Sidewalk Transformers

Pilot Overview

ESB Networks is developing and trialling a prototype miniature secondary substation, known as a sidewalk transformer, as an alternative to conventional reinforcement in urban centres where space for traditional substations is limited. With the electrification of heat and transport and the growing adoption of low-carbon technologies (LCT), demand on LV networks is increasing, creating congestion that requires innovative solutions. ESB Networks is working closely with Kyte Powertech to deliver this solution.

The project focuses on designing and testing a compact transformer that can be deployed on narrow streets in densely populated areas, enabling additional capacity where spatial restrictions prevent the construction of larger substations. A 10 kV 200 kVA prototype sidewalk transformer has been designed, type-tested, and installed at ESB Networks' National Training Centre (NTC) in Portlaoise.

Why it Matters

This initiative offers a cost-effective way to uprate the network and meet rising demand from electrification, particularly in urban settings where space is at a premium. By enabling additional transformers to be installed in constrained environments, the project supports Ireland's transition to low-carbon technologies and enhances network resilience for residential customers.

Pilot Progress and Next Steps

The sidewalk transformer will allow capacity to be increased for customers in city centres without major civil works. The first unit will be installed at the NTC for a non-energised fit-out trial using test MV and LV cables to confirm compatibility. If successful, it will be redeployed to a Dublin site for full operation. The 200 kVA prototype core will be repurposed into a new enclosure and fully connected to the live network at the NTC.

4. Collaboration, Engagement, and Dissemination

Collaboration remains fundamental to the success of ESB Networks' innovation programme. By engaging early and consistently with stakeholders, we ensure that our innovation activities address real system needs, incorporate diverse perspectives, and support national policy objectives, including the delivery of the Climate Action Plan and Ireland's broader decarbonisation targets.

Guided by our Stakeholder Engagement Strategy & Plan 2025 we continue to adopt a structured and transparent approach to stakeholder collaboration across the innovation lifecycle. This ensures that external insight informs our priorities, strengthens project design and supports effective delivery and knowledge transfer. Our engagement spans government departments, regulators, academia, industry associations, suppliers, local authorities, community groups and emerging actors such as flexibility providers and technology innovators.

Over the past year, our collaboration activity has broadened both nationally and internationally. We have engaged in cross-utility working groups through organisations such as EDSO, CIRED, CIGRE, and ENA, focusing on resilience, flexibility, and smart grid development. In addition, we have contributed to research programmes and industry forums, including the Energy Transition Summit, where we shared insights and shaped strategies to accelerate Ireland's clean energy future. These collaborations have enabled us to integrate learnings from other jurisdictions into our operations and inform the delivery of innovation projects that enhance capacity, resilience, and customer empowerment.

Participation in global initiatives, including the Free Electrons programme, ensures that ESB Networks remains connected to international best practice and emerging technologies, enabling us to fast-track innovation pilots, leverage learnings from other jurisdictions and positioning us as a fast-follower where appropriate. In addition, we are actively engaging with the EU Mission Cities initiative, which is paving the way for climate neutrality by 2030. Through this collaboration, we are working alongside leading cities to accelerate decarbonisation efforts, share best practices, and co-develop solutions that support Ireland's transition to a clean electric future.

Looking ahead, ESB Networks will maintain an outward-facing, partnership-driven approach, ensuring that the learnings generated through our innovation activity are widely shared and that stakeholders remain actively involved in shaping our strategic direction. This collaborative ethos is central to delivering the flexible, resilient and customer-focused electricity network required for Ireland's clean electric future.

ESB Networks also continues to play an active role in supporting third-level research that advances knowledge in areas central to the energy transition. We collaborate closely with universities and research centres across Ireland to explore solutions that strengthen distribution system performance, enhance flexibility and enable the integration of low-carbon technologies. Current programmes include work with UCD on electric vehicle impacts through the DERs simulator, and contributions to the NexSys research framework, examining optimal voltage management, and the optimal scheduling of heat pumps to increase hosting capacity for DERs.

We are also participating in the D3Twin project with UCD, TCD and DCU to develop multi-sector digital twins that support national demand-side decarbonisation. In addition, ESB Networks supports further research activity across DKIT, UCC and the Southeast Technological University (SETU), reflecting our commitment to fostering academic partnerships that inform innovation and contribute to the development of future system capabilities.

4.1 Free Electrons

ESB Networks continues to actively participate in the Free Electrons global accelerator programme, which connects utilities with emerging technologies and solutions developed by global start-ups. In 2025, ESB hosted the programme's Grand Finale in Dublin, reinforcing Ireland's presence within the global innovation ecosystem and enabling our teams to engage directly with international peers and high-potential start-ups. Insights from the programme help to inform our innovation pipeline and support our role as a fast-follower, ensuring that the solutions we progress reflect both global best practice and the specific needs of ESB Networks.

Now in its tenth year, Free Electrons is the world's largest open innovation programme designed to bring disruptive energy solutions to market. ESB is a founding member of the programme and works alongside its utility partners, China Light & Power (Hong Kong), EDP (Portugal), E.ON, (Germany), Hydro Quebec (Canada), and Origin Energy (Australia).

4.1.1 Network Capacity and Resilience Workshop

As part of our wider collaboration activities, ESB Networks hosted a technical workshop on network capacity and resilience, bringing together a selection of domestic and international partners to explore emerging approaches that can strengthen system performance as electrification accelerates. The session focused on the practical challenges associated with delivering capacity at scale, maintaining reliability and enhancing climate resilience, and highlighted the role of digitalisation, flexible connections and advanced analytics in meeting these needs.

The insights gathered through this workshop will inform our innovation pipeline during PR6, supporting the development of solutions that enable accelerated capacity delivery, improved asset utilisation and a more adaptable, resilient electricity network.

4.2 Engage With Us

Ireland's electricity network is key to achieving a clean electric future, and ESB Networks' innovation programme plays a vital role in this transition. As we enter PR6, innovation will be required to help deliver national policy objectives, accelerate renewable energy connections, enable electrification, and strengthen system resilience.

Building on our Innovation Strategy 2025, this consultation sets out our priorities for 2026 and highlights planned and ongoing activities. These initiatives seek to address emerging customer and network needs, the challenges associated with aging infrastructure and growing demand, and opportunities from digitalisation, data, and emerging technologies.

Collaboration is central to success. Input from industry, academia, government, communities, and new market participants will help shape a practical and ambitious programme that delivers system-wide benefits. Your feedback will refine focus areas, identify collaboration and fast-follower opportunities, improve project design, and ensure alignment with the wider energy ecosystem.

We invite you to share your views on proposed priorities, emerging challenges, and collaboration opportunities. Together, we can advance an innovation programme that supports Ireland's net zero goals, delivers measurable customer value, and builds a sustainable, flexible, and resilient electricity system.

Your feedback is important to us. Please share your feedback using the link here or scan the QR code below.

Your insights are essential to shaping the future.

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