



NETWORKS



Flexibility Multi Year Plan 2025-2029

**DISTRIBUTION MARKETS AND SYSTEM
OPERATION**

September 2024

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1 Glossary

Table 1: Glossary of Terms Used in This Document

Term	Definition
BtM	Behind-the-Meter
BaU	Business as Usual
BSP	Bulk Supply Point
CAP	Climate Action Plan
CRU	Commission for Regulation of Utilities
CSIP	Common Smart Inverter Profile
CAPEX	Capital Expenditure
CVR	Conservation Voltage Reduction
DECC	Department of the Environment, Climate and Communications
DER	Distributed Energy Resources
DMSO	Distribution Markets System Operation
DSO	Distribution System Operator
DSU	Demand Side Unit
DUoS	Distribution Use of System
DAM	Day-Ahead Market
eHeat	Heating powered by electricity
EV	Electric Vehicle
FMS	Flexibility Market System
FSP	Flexible Service Providers
HV	High Voltage
IDS	Individual Demand Sites
IEEE 2030.5	A standard for communications between smart grid and consumers developed by the Institute of Electrical and Electronics Engineers
ITAGT	Is This a Good Time?
LTE	Long term Evolution
LV	Low Voltage
MV	Medium Voltage
MVP	Minimum Viable Product
MYP	Multi Year Plan

Term	Definition
MWH	Megawatt Hour
NN, LC	National Network, Local Connections
NWA	Non-wire alternatives
NDCC	National Distribution Control Centre
NEDS	National Energy Demand Strategy
OT	Operations Technology
PR5	Price Review 5
PR6	Price Review 6
PV	Photovoltaic
QSQ	Qualification System Questionnaire
R&D	Research and Development
RfT	Request for Tender
SNSP	System Non-Synchronous Penetration
SEAI	Sustainable Energy Authority of Ireland
SECs	Sustainable Energy Communities
TSO	Transmission System Operator
V2G	Vehicle-to-Grid
XLEU	Extra Large Energy User

2 Multi Year Plan Structure

This Multi Year Plan consists of Eight chapters.

Chapter One contains a glossary of terms used throughout the document.

Chapter Two outlines the structure of the Multi Year Plan.

Chapter Three sets out the executive summary, along with sharing an overall view of key milestones.

Chapter Four outlines the strategic direction along with the progress to date and next steps for developing the blueprint.

Chapter Five shares some key and more recent successes focusing on the last 12 months – September '23-September '24.

Chapter Six details the milestones that ESB Networks proposes to deliver from 2025-2029.

Chapter Seven sets out the proposed balanced scorecard for 2025 based on the milestones shared throughout this Multi Year Plan.

In the final chapter, Chapter Eight, stakeholder consultation and feedback received through our Call for Input process is addressed.

3 Executive Summary

The National Network, Local Connections (NN, LC) Programme was established within ESB Networks to deliver the transformative change required on the distribution system to meet ESB Networks' PR5 targets and Climate Action Plan targets, in particular regarding flexible demand and the integration of renewable generation. Through this programme, ESB Networks has worked with, and for, customers to enable fundamental changes to how and when renewable energy is used or stored, as required to decarbonise our society.

Over the course of 2023, the NN, LC Programme was combined with other business areas as part of the Distribution Markets and System Operation (DMSO). The DMSO is a new organisational structure in ESB Networks that brings together the teams from the National Network, Local Connections Programme, Smart Metering, Network Operations and Retail Market Services. DMSO continues the work of enabling flexible services markets and facilitating customer participation in the energy transition, with the NN, LC work programme largely delivered by DMSO Design.

The recent CRU decision paper on [National Energy Demand Strategy](#) (NEDS) identified the work being done by DMSO as a key element of the strategy, especially within Area 2 – Demand flexibility and Response. As part of the NEDS, ESB Networks – along with other key stakeholders – has an important role in working towards the Climate Action Plan 2024 targets for flexible demand.

This updated Multi Year Plan is focussed on DMSO plans for 2025 to 2029, specifically as they relate to the work previously developed by NN, LC, and takes account of relevant action items in the Climate Action Plan and NEDS and also other work which will enable the transition. This plan aligns with NEDS action 2.9¹ by continuing the transition from focused product development to growing flexible market liquidity and leveraging broader, technology-agnostic strategies to foster a competitive market. The plan will also reflect work to be done to deliver on ESB Networks' [Networks for Net Zero Strategy](#) (published in January 2023), with a clear commitment to Ireland's climate action policies and ambitions. In some cases, where it makes sense, milestones and workstreams have been merged. An example is where flexible demand connections will be aimed at facilitating eHeat and electrification of commercial transport thereby delivering on cross sectoral development.

A common theme of the above strategies and action plans, and carried through into this Multi Year Plan, is that significant investment in flexibility will be key to delivering on the Net Zero Strategy. Flexible demand will be central to our ability to support the rapid increases in demand and distributed renewable generation across the Irish electricity system quickly, efficiently and securely. In addition, it is expected that flexible demand will be central to Ireland's ability to reduce carbon emissions, by enabling low carbon demand growth and by matching new or changing energy demand with renewable energy

¹[NEDS Decision Paper and Annex.pdf \(divio-media.com\)](#)

generation. Finally, flexible demand, including as facilitated by storage, provides new opportunities for all customers and businesses to benefit from taking an active role in climate action.

Amongst the key milestones set out in this Multi Year Plan are:

- **The introduction of flexible demand connections:** This will facilitate early connection of customers in advance of capital infrastructure being available and will incorporate initiatives to facilitate eHeat and commercial transport amongst others. In addition, this will facilitate the decarbonisation of energy by allowing additional electrical load to be accommodated more quickly on the system.
- **Review the potential for EVs for Demand Response:** In line with action 6.2.5 under the National Energy Demand strategy (NEDS), we will build on the Flex Charging pilot and apply the learnings to develop a new product/service to leverage the flexibility of this technology as well as reviewing the technology advancements in V2G.
- **Piloting and test of Behind the Meter activation architectures:** These pilots will trial registration, monitoring and activation of behind the meter DER technologies with an initial primary focus on PV. The pilots will develop an approach for integrating smart inverter-based functional capabilities.
- **Micro and Mini-generation:** We will continue to work with EirGrid to address the operational challenges presented by small scale and micro-generation and ensure any potential system issues are identified and plans are put in place to mitigate against these. By delivering on this milestone, we will continue to optimise the use of Ireland's renewable energy
- **Launch a National Outreach Programme:** A programme of activity at a national and local level which has the aim of raising awareness of demand side flexibility, embedding basic concepts, and supporting customers on their journey towards proactive energy management.
- **Iterate Ireland's Electricity Community Toolkit:** New features and functionality will be released for [Ireland's Electricity Community Toolkit](#) which was delivered in 2023. This is in support of climate action plan targets for ESB Networks
- **Iterate and support "Is This a Good Time?":** We will continue delivery of ["Is This a Good Time?"](#) which aims to educate domestic customers and engage them to positively influence behaviour in relation to demand side flexibility

DMSO will continue to deliver in partnership with stakeholders and organisations, with extensive customer research, education, and recruitment initiatives to build customer participation and awareness. As a result of this engagement the proposals set out in this Multi Year Plan have been heavily influenced by stakeholder consultation and feedback. A summary of feedback to our most recent Call for Input is provided in Section 8 of this document.

4 Looking forward: Strategic direction and Blueprint

4.1 Background

In 2023, ESB Networks commenced the development of a Distribution Markets and System Operation (DMSO) Blueprint, setting out the evolution of the DMSO function with respect to the:

- Continued safe, secure, reliable and economic operation of an evolving distribution system.
- Continued facilitation of Retail Market and Distribution Flexibility Markets.
- Embedding of flexible generation and demand and smart energy services to support customers' changing needs and expectations (as we transition to a low-carbon energy system).

The DMSO Blueprint is shaped by an evolving regulatory and legislative landscape, including the:

- EU's reformed Electricity Market [Directive](#) and [Regulation](#);
- CRU's [National Energy Demand Strategy](#);
- DECC's [Climate Action Plan](#).

Ultimately, the Blueprint aims to provide a long-term vision – and underpinning roadmap – to 2035. It brings together regulatory direction, customer needs and ESB Networks' own ambitions in achieving a net zero-ready distribution system by 2040, setting out a plan to respond to the needs of society, industry and the environment.

The DMSO Blueprint evolution sets out how our engagement with our customers and industry will evolve in line with the evolving energy landscape– across a multi-phase timeline out to 2035, i.e.:

- End of PR5 (December 2025);
- Mid-PR6 (December 2027);
- End of PR6 (December 2030);
- End of PR7 (December 2035).

4.2 Progress to Date

Since submitting the 2024-2028 Flexibility Multi Year Plan in September 2023, ESB Networks has undertaken extensive work to progress the development of the DMSO Blueprint. This includes:

- **Product and Market Inventory Development:** The development of key offerings that are – and will be – made available to customers and stakeholders, categorised across (i) congestion, (ii) capacity, (iii) continuity, (iv) choice, and (v) customer.
- **DMSO Roadmap Development:** The development of detailed roadmaps – underpinned by robust deliverability assessments – across (i) flexibility market

transformation, (ii) operations transformation, and (iii) smart+ and retail market transformation.

- **Price Review 6 Alignment:** The alignment of detailed PR6 proposals with the broader DMSO Blueprint multi-phase timeline, incorporating 2026-2030 initiatives within the longer-term roadmap to 2035.
- **Evolving Regulation/Legislation Alignment:** The alignment of the DMSO Blueprint vision with emerging requirements set out in new and updated regulations/legislation (including those referenced above).
- **Industry Engagement Approach Development:** As discussed below in 'next steps', the development of a DMSO Blueprint industry engagement approach, ESB Networks will engage – in Q4 2024 – with stakeholders on proposals/timelines.

4.3 Next Steps

In Q4 2024, ESB Networks will engage with the CRU, government, industry and the wider public on proposals/timelines with respect to the DMSO Blueprint (and how it will evolve out to 2035); this will afford our key stakeholders the opportunity to share their thoughts that will, subsequently, inform the finalised proposals/timelines.

Stakeholder engagement will include (i) bilateral discussions with the CRU, DECC and EirGrid, and (ii) the publishing of an external-facing public consultation document, setting out:

- Our understanding of the evolving needs/wants of our customers (LV, MV/HV and generation), including new technologies available to them;
- The products/services that the DMSO proposes to make available to our customers to facilitate their evolving needs/wants.

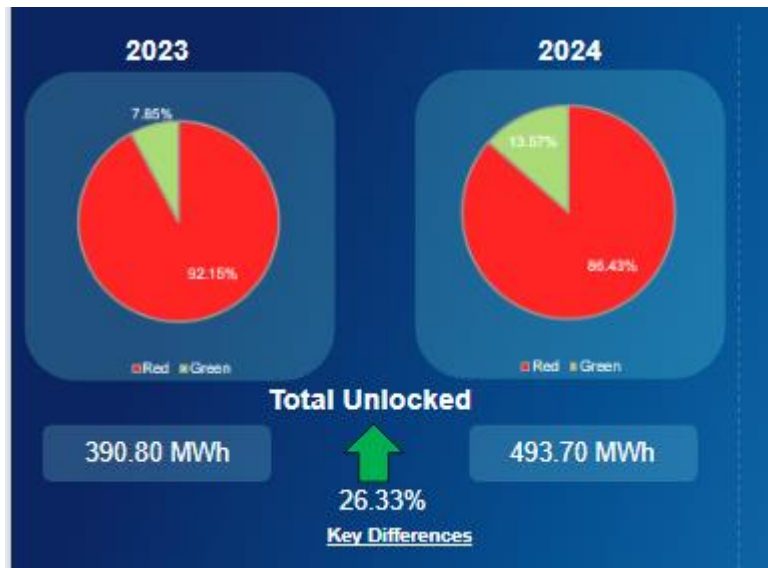
5 Looking back: Success to date

Since early 2021, significant progress has been made in testing, and proving, new capabilities – as well as enhancing existing capability – to transform the role of the DSO (as per the Clean Energy Package and Price Review 5 regulatory incentives). Many of these successes have been detailed in last year’s Multi Year Plan, however it is appropriate to note some key and more recent successes focussed on the last 12 months – September 2023-September 2024.

- Is This a Good Time?" (ITAGT) is a nationwide initiative aimed at educating registrants about how to take control of their electricity consumption during peak hours, while promoting and rewarding customers who reduce demand during peak events. The second phase of ‘Is This a Good Time?’ went live in August 2023. This phase 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. To date ITAGT has resulted in a 23% increase of customer awareness of peak times and an 18% increase in knowledge of the role of weather/wind in renewable generation.
- In December 2023 [Ireland’s Electricity Community Toolkit](#) was launched on the ESB Networks’ website. This provides a space for Sustainable Energy Communities (SECs) and other interested parties to see the uptake of flexible products, learn about flexible demand, and inform key decisions around times to use electricity based on weather, all at the county level. Each county is also ranked a ‘green score’ for their participation across flexible products and behaviours, to rank each county and encourage gamification. It is envisaged that this space will grow and evolve with continued stakeholder engagement to further support the target audience in decision making flexible product uptake and changes in consumption behaviour.
- Initiatives to improve **Dynamic Instruction Sets – which were first implemented in 2023** – with a view to
 - Providing more granular results (hourly rather than daily updates). In 2023 ESB Networks sent one daily status, informing the DSU which IDS will be green (operational) or red (not operational) for the day. This process meant even a 1-hour red period during the day results in the IDS being marked as red for the entire day. To improve this process and increase the time when IDSs can operate, hourly profiles have been implemented, providing greater granularity of data and the opportunity for more greens and MWH unlocked (as demonstrated in graphic provided in Figure 1 below).
 - Minimising the impact of changes to system configuration (due to planned work or faults for example) on parties providing services to the TSO markets

The overall impact of both these initiatives has been to release additional capacity as shown below:

Figure 1: MWh capacity released Mid-September 2023 versus Mid-September 2024



- The publication of a consultation on our Demand Flexibility Product² in December 2023. Our proposals pertaining to our Demand Flexibility Product were heavily informed by our ‘Scenarios for 15-20% Flexible System Demand’ consultation published in June 2023.
- Identifying key locations where a Demand Flexibility Product of significant scale has the potential to alleviate system congestion thereby enabling additional load growth and electrification of energy.
- Facilitating an external stakeholder webinar on our Demand Flexibility Product, in collaboration with CRU, to communicate our proposals and elicit feedback from our external stakeholders.
- At the beginning of 2024, agreement was reached between the two system operators – ESB Networks and EirGrid – on a high-level design for the future Operating Model. This high-level design sets out the vision and principles of the operating model, ensuring that the system operators have a coherent approach to optimising the electricity system as a whole and delivering efficient solutions for the electricity consumer.
- The implementation of Pilot 4 – Flexible Access Connections – expanded the ability of ESB Networks to offer non-firm or flexible generator connections. A key element of the work was establishing the required operational procedures within ESB Networks to ensure coordination between the generator and dispatch centres, thereby ensuring system security is not compromised.
- An improved process was developed to update EirGrid on the uptake of micro and mini-generation at a Bulk Supply Point³ (BSP) level on a quarterly basis. These updates will assist EirGrid in forecasting of overall generation and net demand on

² [ESB Networks – Demand Flexibility Product Proposal – Consultation Document ESB Networks](#)

³ Bulk Supply Points are the boundaries between the transmission and distribution systems



the transmission system and is part of the work in train to improve data exchange and information sharing.

- The hosting of three of our NN, LC programme Advisory Councils over the course of 2023 which affords us the opportunity to brief our Advisory Council members of our overall programme progress and take onboard feedback to inform our work.
- Facilitating an external stakeholder roundtable on behind-the-meter architecture and a consultation on same in December 2023.
- Attending external conferences ensuring an NN, LC presence and engaging with key industry stakeholders about the programme.
- Working closely with external stakeholders to initiate a lessons learned exercise on Beat the Peak Commercial to inform potential changes and improvements to future iterations. This exercise has culminated in the recent execution of contracts under Beat the Peak Business

6 2025-2029 Milestones

This section sets out the milestones to be delivered under this plan. The milestones are generally grouped on a functional basis with the year of delivery included in the milestone title.

The milestones are also segregated into 3 key themes:

- Non-Wire Alternatives
- New Products and Services
- Transparency and reporting

A brief description of each theme is included at the beginning of each of the sections 6.1, 6.2 and 6.3.

6.1 Non Wire Alternatives Milestones

For the purposes of this Multi Year Plan, “Non Wire Alternatives” refer to actions or milestones which facilitate and accelerate the introduction of any flexibility or demand response⁴ (including for example any of the products or services included in the next section) onto the Irish distribution system. Non Wire Alternatives actions include for example the introduction of standard technological requirements, or industry partnerships to accelerate new communications and control models. For clarity, we do not include the products or services themselves in this section, as they are addressed separately in the next section.

6.1.1 Behind-the-Meter Architecture

Developing Behind the Meter (BtM) standards is crucial for leveraging the capabilities and mitigating the challenges of distributed low-carbon technologies. Engaging the industry in developing this standard is key, making it important to undertake pilot learnings that shape consensus on interconnection standards, architecture, and recommended practices.

These milestones support the growing national electrification strategies and are aligned with the goals outlined in CAP24, and the National Energy Demand Strategy, further driving ESB Networks’ commitment to sustainable climate and energy objectives.

6.1.1.1 Pilot End-to-End Behind-the-Meter Architecture (2025)

ESB Networks will look to pilot and test a range of target Behind the Meter architectures (cloud, gateway), with IEEE 2030.5 as the dispatch protocol, to integrate and standardise inverter-based technologies for use on the Irish distribution system. Through this piloting and testing we can learn how the overall implementation works in reality and how we can transition this to a standard and eventually incorporate into BaU. This will provide the technical/commercial groundwork and detail to demonstrate the requirements needed to

⁴ Non-wire alternatives (NWA) typically refer to mechanisms for improving network capacity through means other than capital investment in network infrastructure. Flexible services are a key NWA.

successfully integrate these technologies and provide confidence to stakeholders. The pilot will be an important contributor to inform stakeholders on a new standard for integrating new smart inverter-based functional capabilities and by doing so will drive the development of consensus for an interconnection standard and architecture along with recommended practices.

ESB Networks are working closely with Irish 3rd level technology research institutes to support Behind the Meter proof of concept test platforms. This will de-risk network pilots by validating equipment in a controlled laboratory environment prior to installation in customer premises. By helping to identify and solve technical barriers to the widespread adoption of smart grid control techniques, it is anticipated that the learnings gained from such research and development should indirectly help in facilitating consumers to participate in the provision of energy services.

The proposed high-level architecture overview is presented in the Figure 2 below, utilising IEEE 2030.5 as the application-level dispatch protocol standard. This architecture demonstrates 3 technology options that will be explored via network piloting in 2025. ESB Networks always consider both the technical and economic drivers for any architecture to ensure customers can easily participate in flexibility services while also maintaining grid security and operational continuity of the network. The initial focus of the pilot will be on smart inverter interfaced PV – with later pilots exploring smart EV charging and potentially V₂G (Vehicle-to-Grid) services.

Figure 2: High Level Architecture Overview

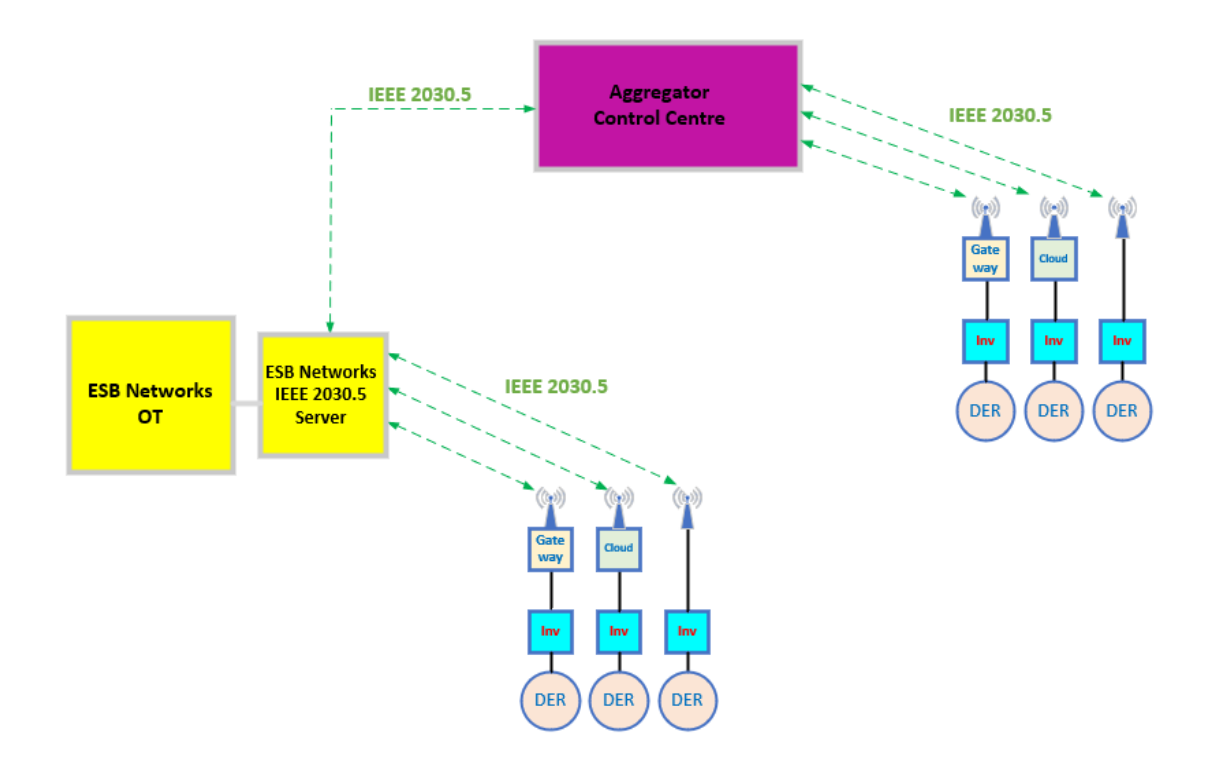


Table 2: Description of architecture components

Component	Description
ESB Networks OT (Operations Technology)	ESB Network’s Operations Head End Systems
ESB Networks IEEE 2030.5 Server	The IEEE 2030.5 Server will be hosted by ESB Networks and will be compliant to the IEEE CSIP (Common Smart Inverter Profile) Standard.
Dispatch Protocol Standard	IEEE 2030.5 as the application layer with secure transport layer such as LTE/Cellular 4G/5G is recommended. The wide-area networks may be public networks. ESB Networks recommend IEEE 2030.5 protocol over this network with: <ul style="list-style-type: none"> a) Well-defined cybersecurity b) Support for all the additional functionalities that reside in the architecture such as logging, alarms, schedules, defaults.
Aggregator Control Centre	Aggregator’s Operations Centre (including aggregator head end system) shall adhere to all ESB Networks security measures including physical, staff, and cybersecurity.
Gateway	BtM Communication Hub. The grid edge hardware device keeps the functional requirements of the inverter system minimised.
Cloud	Virtual Communication Software Client Platform
Inv (Smart Inverters)	Advanced smart inverters with interoperable communications capability and shall be IS EN50549-1 standard compliant.
DER	Mini-/Micro-generation PV panels with associated battery energy storage unit.

The main deliverables under this milestone in 2025 are:

- Developing a demonstration platform that utilises technical learnings from research testbeds to support smart inverter-based network integration.
- Implementing a network pilot to test the Behind the Meter technology architecture options – demonstrating both monitoring and control capabilities.
- Introduce technical requirements for interoperable telecommunications and control facilities for inverter interfaced small scale solar PV and battery sources (NEDS 1.16 Q3 2025).

6.1.1.2 Commence roll out of Behind-the-Meter dispatch architecture enduring solution (2026)

ESB Networks will commence the design of the enduring technological platform to include integration of ESB Networks operations, IEEE2030.5 DER dispatch infrastructure, full interoperability control, dynamic grid management of the distribution system, robust grid edge cybersecurity, vendor agnostic interface to the behind the meter devices and enabling remote security and system updates. This will involve the commencement of end-to-end integration of this Behind the Meter architecture, allowing the set-up, commissioning, operation, and ongoing compliance monitoring functions. Parallel to the technical development is the need to raise the level of awareness and education in relation to behind the meter standards to support customer adoption of products and services.

The main deliverables under this milestone for 2026 are:

- Detailed design study for the Operations Technology (OT) dispatch architecture integration with OT systems.
- Commence the integration steps of Behind the Meter dispatch architecture platform to operations systems.
- Develop communication plan and initiatives to build awareness of behind the meter standards and maximise engagement with behind the meter services:

Incorporating the Behind the Meter dispatch infrastructure into the OT landscape will facilitate the network integration and control for Behind the Meter assets.

6.1.1.3 Migration of Behind-the-Meter DER dispatch to enduring state (2027)

The target end state is to integrate the behind-the meter DER dispatch architecture with core OT and flexibility management systems. The enduring state architecture will include a utility side platform which allows monitoring and control of DERs, and dynamic grid management of the distribution system. The solution will include robust grid edge cybersecurity and enable remote security and system updates.

The main deliverable under this milestone for 2027 is:

- Integration of inverter based DER dispatch architecture platform with related operations and flexibility management systems.
- Deliver a communication plan and initiatives to grow the adaption of behind the meter standards and maximise engagement with behind the meter services:

6.1.2 Develop Market Liquidity

The development of market liquidity is a continuous objective aimed at enhancing participation across all sectors of demand, including domestic, community, industrial, heating, and transportation. There are many benefits to a liquid market; both for ESB Networks, and market participants. By fostering a liquid market, it becomes easier for participants to trade their flexible demand, leading to more efficient price discovery and therefore, a stable revenue stream. A liquid market also ensures additional options for

ESB Networks to manage network constraints. This increased participation can drive innovation, improve resource allocation, and ultimately contribute to a more resilient and dynamic economy.

The deliverables of the milestones in this area contribute to our overall strategy by supporting the decarbonisation of heat and transport in Ireland through electrification thereby supporting the realisation of Ireland's Climate Action Plan targets. The delivery of these milestones will be shaped to deliver on NEDs target 2.10 DSO demand flexibility product: Review further potential options for DSO demand flexibility products including industrial heat.

6.1.2.1 Tender for locational summer flexibility to assist with outage management (2025)

The 2024-28 Multi Year Plan referenced the rollout of “summer services” which are now referred to as locational summer flexibility. This scheme is where ESB Networks will issue a request for tender for flexible demand to be available over the period when most maintenance and upgrade works are undertaken on the electrical network. This pilot will involve multiple internal stakeholders including Customer Service Supervisors working in local areas.

Whilst we did not receive any tender responses in 2024 under this initiative, ESB Networks will engage with industry to understand why potential applicants did not submit tender applications. ESB Networks will use this learning to inform the tender in 2025. Specific locations will be identified where maintenance and upgrade works are planned for 2025; these locations will form part of the tender and be geographically represented as part of the tender documentation.

The main deliverables under this milestone in 2025 are:

- Building flexibility market liquidity and showing Flexible Service Providers (FSP's) that there is an additional source of revenue for being available and providing a service to the DSO on request.
- Reducing the impact on customers of planned outages in the local area

6.1.2.2 Review further potential options for DSO demand flexibility products (2025)

Undertake a study of the sources of flexibility from particular market segments and consider products that enable increased participation from these market segments:

The main deliverables under this milestone in 2025 are:

- Review further potential options for DSO demand flexibility products including industrial heat.

6.1.2.3 Achieve sufficient market liquidity to address localised network congestion (2026)

One of the objectives of flexible demand is to provide an alternative or complementary solution to network reinforcement. This milestone refers to our endeavours to build enough market liquidity by 2026 so that in some locations we can solve real-time network

congestion (noting that to date customer participation is substantially lower than the level needed to achieve this).

The main deliverables under this milestone for 2026 are:

- To successfully procure flexibility services and build sufficient flexibility market liquidity in a localised area to solve identified real-time network congestion.
- Demonstrate that flexibility is an alternative and/or complementary solution to network reinforcement.

6.1.3 Flexibility Market System

In the 2024-28 Multi Year Plan, ESB Networks referred to a flexibility market platform; this is now known as a Flexibility Market System (FMS). To operate flexibility markets, we rely on the use of market systems and platforms to interact with participating customers and energy companies. Currently, a range of in-house developed and off the shelf products are being used to achieve this, but more mature technology will be necessary as the scale and nature of flexible services grows. These milestones are for the introduction of a new flexibility market system in 2026 to support flexible service providers who are participating in the market. Through implementing a fully scalable system that can cater to increasing levels of flexible market liquidity these deliverables contribute to our overall strategy.

6.1.3.1 Procurement of a Flexibility Market System (2025)

In 2025 the procurement of the Flexibility Market system will be progressed with the following main deliverables under this milestone:

- Develop a list of requirements for an enduring flexible market system.
- Go to tender for a Flexibility Market System to meet the enduring needs of a liquid flexibility market (note procurement will conclude in early 2026).

6.1.3.2 Phase One Implementation of the Flexibility Market System (2026)

The main deliverables under this milestone for 2026 are:

- Conclude procurement of the Flexibility Market System
- Develop a detailed plan for the implementation of the Flexibility Market System.
- Refine the existing in-house developed solution' to facilitate new products and automate where possible.

6.1.3.3 Phase Two Implementation of the Flexibility Market System (2027)

The main deliverables under this milestone for 2027 are:

- Flexibility market competition advertisement through the FMS that clearly identifies geographic locations where we are seeking to procure flexibility service.
- Commissioning of an external facing platform to assist Flexible Service Providers in management of their flexible assets and aid in streamlining the associated flexibility market settlement process.

Full integration of FMS with OT systems will take place in 2028-2030.

6.1.4 Network Data and Operations Support

In tandem with developing the Market Systems, and separately the operations systems, there will need to be robust support to operate and maintain systems. This support will both ensure that the network data is fit for purpose and will also ensure the resources are in place to analyse output from the systems and respond accordingly.

These milestones are key to ensuring that – while transitioning to a more flexible power system – we maintain the safety and security of same.

6.1.4.1 Establish Network Data Requirements (2026)

As real time management of the power system becomes more complex, automated systems becomes more important. Accurate data, available in a timely manner, and reliably maintained is key to facilitate the transition.

As part of the delivery of this milestone in 2026, several key actions will be taken:

- Identify required distribution system data requirements to support automated and data-driven decisions for more efficient operations.
- Determine the necessary data accuracy and frequency levels for optimal system performance.
- Determine the operational limits which are appropriate for an automated system.

Ensuring data accuracy will require ongoing maintenance. With this in mind from 2026 and onwards,

- Data requirements will be assessed, and updated if required, to ensure the optimal operation and performance of the IT/OT systems and the services markets. This will be especially important where new technologies are available and new services are to be offered.

The data strategy described above is targeted at securing a robust and responsive IT/OT infrastructure which in turn will support ESB Networks ability to better anticipate and respond to current and future distribution grid challenges in an integrated way.

6.1.4.2 Establish near real-time and real-time operational planning desks (2026)

This milestone relates to the implementation of operational planning desks to carry out near-time and real time network monitoring and operations as well as dispatching flexible services to address current or anticipated grid demands. The new operational planning desks will play a pivotal role, making use of operational tools to facilitate scheduling and dispatching of flexible services, aligned with contractual obligations (e.g., settlement, payments, contracted delivery periods), while ensuring full coordination with the BaU operations of the control centre to secure grid security, stability and resilience.

The objectives of these teams will include:

- Use of operational tools to facilitate scheduling and dispatching of flexible services, aligned with contractual obligations, in anticipation of grid demands and/or outage management.
- Use of operational tools to facilitate customers – both generation and demand⁵ – with Flexible Connection Agreements – in anticipation of grid demands and/or outage management.
- Ensuring full coordination with the BaU operations of the National Distribution Control Centre (NDCC) to secure grid security, stability and resilience.
- Ensuring full coordination with other internal teams such as the planning team
- Ensuring full coordination with TSO in line with the joint system operating model.
- Maintaining oversight over aspects related to Flexible Service Providers (FSP) such as activation and engagement and supporting market operations as they carry out settlement and payments as required.

As part of the delivery of this milestone in 2025, several key actions will be progressed:

- Clearly outline the responsibilities and objectives of the new flexibility operational desk in coordination with the NDCC and other relevant stakeholders.
- Identification and recruitment of staff with the relevant skills.
- Support the development of IT/OT technologies to anticipate potential issues and optimize energy dispatch based on historical and real-time data.
- Engagement and coordination with BaU operations and TSO as required.

For the full delivery of this milestone in 2026 and onwards, additional actions are required to be taken:

- Supporting the development of training programmes for operators on using the real-time desk tools (e.g., interpreting data, execution of power flows, activation of flexibility contracts) in a simulated environment.
- Implement yearly reviews of processes to enhance operational policies to ensure they are consistently updated and aligned with the evolving needs of the distribution system and therefore maintaining their effectiveness and market value creation.

The availability of a near and real-time operational desk will be key in driving the energy transition by enabling the growth of the flexibility market.

6.1.5 Review the potential of Electric Vehicles for Demand Response

Electric vehicles (EVs) have the potential to enhance grid flexibility and reduce distribution network congestion through smart charging, vehicle-to-grid (V2G) technology, and demand response programs. By charging during off-peak hours and discharging energy back to the grid during peak times, EVs could help balance the load and prevent congestion. Additionally, integrating EVs with renewable energy sources and decentralised energy resources creates a more resilient and efficient energy system. The

⁵ The initiative to develop flexible connections for demand customers is described in section 6.2.3

milestones that have been identified here will also deliver on the National Energy Demand Strategy Implementation Plan.

6.1.5.1 Plan to Optimise EV fleet charging (NEDS Actions 1.3, 2.16, 2.17) (2025)

Milestones for 2025:

- Building on the learnings from the Flex Charging Pilot, develop and publish plan to optimise EV fleet charging through technology and software solutions. Q2 2025
- Carry out a study on V2G readiness and evaluation of road to adoption. Develop and publish technical assessment of how the available smart EV charging and V2G capacity can be maximised through network operations. (NEDS 2.17): Q2 2025
- Engage across relevant parties to develop propositions for smart charging services, including an exploratory investigation of vehicle-to grid (V2G) services. Establish working group to explore barriers and enablers. Publish programme of work. (NEDS 1.3): Q4 2025

6.1.6 Capital Reinforcement Deferral Process

Flexible demand, once available as a service, will be a key enabler of system growth – both growth in demand and growth in locally connected generation. Use of these services will allow us to optimise the use of the system and as a result has the potential to allow us to defer capital reinforcement on the system. Ensuring that we get best value from both our flexible demand and our infrastructure while maintaining a secure and reliable system is an important part of the energy transition.

6.1.6.1 Initiative to Deliver Network Capacity in a localised Area Via a Non-Wire Solution (2025)

In 2025 we intend to build on work already done in identifying locations where there is a role for flexibility in addressing network congestion. In this way flexibility will both facilitate organic load growth on the system (for example where domestic customers install heat pumps) and also facilitate new load (or increased load) requests from commercial and industrial customers (who may for example be transitioning to electricity to supply their heat or process needs as they work to transition their own businesses to be less carbon intensive).

In 2025 we intend to use flexibility a specific location of scale to facilitate growth through a combination of:

- Market services (in line with the milestone described in Section 6.2.4)
- Via flexible connections (in line with the milestone described in Section 6.2.3)

6.1.6.2 Flexible Services adopted as BaU (2028)

The integration of flexibility into the long-term planning processes of the DSO is an ongoing process. From a power systems perspective identifying where flexible services provide a valid solution to network congestion requires an assessment of the load profiles of existing and new loads and generation. The key to identifying flexible solutions lies in

building on the knowledge of the current and future requirements of the distribution system – already embedded within the planning area – to the identification of areas in the network where the timing and profile of the demand is such that the ability to control distributed energy resources or demand may facilitate optimum use of the existing and new infrastructure.

To further this work beyond 2025, the main deliverables under this milestone for 2028 are:

- Development of power system studies to identify and quantify system congestion to understand and measure its limitations, challenges and opportunities for customer involvement.
- Identification of new flexibility products and services to mitigate the identified system congestion.
- Evaluation and assessment on how each identified solution will affect grid's performance, stability, resilience and efficiency.
- Selection methods for the optimal investment solution through modelling several scenarios and conducting cost-benefit analyses.

This ESB Networks milestone aims to continuously evaluate, develop, and refine flexibility services and products, not only by revising technical criteria but also by reassessing the financial assessment frameworks.

This milestone will be further supported by delivery of the milestones identified in 6.1.2– achieving market liquidity – and also 6.1.3– availability of a Flexible Market System. There will also be a dependency on operating systems to get full value from flexibility.

6.1.7 Enhance Education, Awareness and Engagement to Grow Participation

The actions undertaken under this milestone is focussed on our strategic goals of **Leading the Public Conversation** in relation to demand side flexibility and **Optimising Customer Behaviour** so that demand side flexibility becomes a normalised part of everyday electricity use in the home and in businesses. Initiatives will be carefully designed to support an understanding of demand side flexibility, starting from basic concepts, and will guide customers on their journey from low level awareness to proactive energy management. We are committed to an evidence-based approach, harnessing extensive customer research to inform the design and implementation of our initiatives, ensuring they resonate with our audience's needs and preferences. Analytics will play a crucial role in gauging the success of our initiatives, enabling us to fine-tune our approach and tailor initiatives for maximum impact. Continuous measurement and feedback mechanisms are in place, providing the insights needed for iterative optimisation. These deliverables contribute to our overall strategy by enabling communities to participate in flexibility markets.

6.1.7.1 Route to market for community-based flexibility participation (2025)

We believe that energy communities could help us drive greater awareness and adoption of flexible services across Ireland. However, through piloting activities in 2021 – 2023 it has become apparent that various conditions for participating in flexible service markets

create barriers to entry for energy communities. This milestone is for ESB Networks to establish a route to market for energy communities that are currently unable to pass the qualification process to participate in local flexibility market arrangements.

The main deliverables under this milestone in 2025 are:

- Identify the challenges and potential barriers in the qualification process for communities to participate in flexibility markets.
- Determine a route to market for communities that ESB Networks can implement.
- Develop a plan to implement the route to market.
- Communicate this plan through appropriate channels to ensure all energy communities are aware of the route to market.

6.1.7.2 Initiatives to Build Awareness, Education, and Engagement with Demand Side Flexibility for Customers (2025)

To fully understand how best to effect behavioural change for customers, we will proactively experiment with a variety of nudges and techniques to identify the most effective strategies for promoting and sustaining the adoption of demand side flexibility practices.

Main Deliverables in 2025:

- **Launch National Outreach Programme:** A programme of activities to support all customers. Operating at both national and local levels aimed at raising awareness of demand side flexibility, embedding basic concepts, and supporting customers on their journey towards proactive energy management. The National Outreach Programme will include:
 - **National Awareness and Education Campaign**
 - **Virtual or In-Person Events:** This may include webinars, a mobile educational unit, and involvement in conferences and trade shows.
 - **Programme for School-Aged Children:** Targeted at providing practical knowledge and hands-on experience to support understanding of demand flexibility.
 - **Self-Guided Learning:** Including knowledge articles, videos, tools, etc. An example is Ireland's Energy Community Toolkit. In-person events will support non-digital users, and there will be a roadmap of activities for vulnerable customers.
 - **Digital Applications:** To support customer engagement with tools, products, and services related to demand side flexibility offered by ESB Networks or partners.
 - **Webinars / Direct Customer engagement:** To support customers in participation in learning more about commercial products available.
- **Iterate Ireland Energy Community Toolkit:** New features and functionality will be released for Ireland's Energy Community Toolkit, delivered in 2023, in support of climate action plan targets for ESB Networks (CAP EL/23/26).

Specific to domestic customers

- **Iterate and Support “Is This a Good Time?”**: We will continue delivering the “Is This a Good Time?” product, which aims to educate customers and engage them to positively influence behaviour in relation to demand side flexibility. Elements to be considered include:
 - Personalising communications and elements of the product.
 - Introducing elements of behavioural nudging and gamification.
- **Develop Roadmap to Support Vulnerable Customers**: Initially, customers requiring additional support to engage with demand flexibility from medical, digital, economic, or language perspectives will be identified. Research will uncover specific needs, challenges, and motivations. Further design work will develop a roadmap of engagement and specific solutions for these groups, such as deploying physical devices, tailored training programmes, and financial rewards or incentives.

Specific to non-domestic customers

- **Targeted Research and Insights for Relevant Non-Domestic Sectors**: Dedicated research is key to ensuring we design products, services, and engagement with an understanding of customer behaviours, needs, and challenges. We plan to conduct qualitative and quantitative research into the energy needs and behaviours of non-domestic customers, as well as to understand the motivations and barriers which may impact their ability or desire to participate with demand side flexibility products, services, or initiatives.
- **Develop SME Flexible Demand Products MVP Outline**: This milestone relates to the creation of an initiative aimed at a specific segment or segments within the non-domestic customer base, to raise awareness and engagement with demand side flexibility. The design of the initiative will be informed by research with industry to understand the challenges, motivations, and barriers to their participation with demand side flexibility.

6.1.8 Conservation Voltage Reduction

Conservation Voltage Reduction (CVR) is a means of reducing demand by reducing system voltage to the lower range of the voltage standard. ESB Networks is currently piloting CVR to develop the technical capability as well as supporting processes and procedures. A key outcome of the pilot will be to quantify the effectiveness of CVR on the Irish system. The pilot findings will help identify the scenarios where CVR is most useful and also to develop the future approach to optimal voltage management. The forecasted uptake of DER is predicted to have an impact on system voltage and a voltage optimisation pilot is included in the Operation Systems Delivery roadmap to commence in 2028.

6.2 New Products and Services Milestones

New Products and Services refer to new products or services to support or enable flexible demand or generation, for example:

- New market-based products introduced by the DSO to incentivise flexible demand;
- New connections options introduced by the DSO to enable flexible connections for demand, storage or generation.
- New services introduced by the DSO to complement market-based products, for example products and services providing educational or awareness benefits, supporting the uptake of more market-based solutions.

It is worth noting here that – where ESB Networks are procuring flexible services (or entering into flexible connections agreements with customer) – we are technology neutral as to how the services are provided. However, we are aware of new technologies being used by customers – such as HVO generation – and welcome these technologies.

6.2.1 Demand Flexibility Product

Following on from a strategic review in 2023, it was determined that the DMSO would develop a Demand Flexibility Product for the purposes of congestion management on the distribution network. The aim of this product is to deliver demand reduction, demand shifting or to inject power onto the distribution network for a number of hours when needed to assist with congestion on the distribution network. While congestion management will be its primary function, the asset providing the flexibility services should also be able earn revenue from SEM wholesale capacity, energy and balancing markets. This product has been designed so that participation in these markets will help alleviate net costs for Distribution Use of System (DUoS) customers.

While the initial assessment has been focussed on areas where large quantities of flexible service are required, consideration will be given also to tendering for locations where smaller scale would be suitable.

This initiative is a key element of our overall strategy in contributing to our ability to reach our 2025 and 2030 Climate Action Plan demand flexibility targets.

6.2.1.1 Launch procurement process for Demand Flexibility Product (2025)

In December 2023, ESB Networks published a consultation proposing the development and delivery of this new product including the steps to procure. In July 2024, CRU published their Decision “DSO Demand Flexibility Product Procurement Decision Paper (CRU202469)”⁶.

⁶ [CRU202469 DSO Demand Flexibility Product Procurement Decision Paper.pdf \(dio-media.com\)](https://www.dio-media.com)

The main deliverables under this milestone until end 2025 are:

- Publication of second consultation on techno-economic analysis of the sharing factor, negative incentives and day-in-the-life of an asset.
- Publication of qualification system questionnaire
- Publication of Request for Tender
- Award of Contract for Flexible Services
- Investigation into locations where smaller scale flexible services could be procured.

6.2.1.2 Connection offers issued for demand flexibility product initiative (2027)

This specific milestone targets the delivery of connection offers to any customers contracting for this service who are providing same via a new connection for storage. The actions described under this milestone ensure the optimum value to the power system is achieved through this initiative.

To deliver this milestone in 2027, several key actions will be taken:

- Further develop power system studies frameworks to identifying locations where storage provides the optimum solution in relieving high demand and facilitating renewable generation.
- Develop algorithms to identify charge/discharge cycles.
- Introduce changed standards which allows an assessment of these connections which considers how they will be operated.
- Establish enduring operational procedures to integrate this new type of flexible services into existing network infrastructure while accommodating seamless flexible operation and activation these connections.

This milestone is also dependant on the successful parties applying for a connection in a prompt manner.

The development and deployment of large-scale demand flexibility services is expected to increase the number of market participants and therefore increase overall market liquidity, aligning with the goals outlined in CAP24, further driving ESB Networks' commitment to sustainable climate and energy objectives.

6.2.1.3 Demand Flexibility product go live for 15-year contracts (2028)

As set out in Section 6.2.1.1, procurement of the Demand Flexibility Product is due to commence in 2024 with the publication of a Qualification System Questionnaire (QSQ). A Request for Tender (RfT) is due to be published by mid-year 2025. Following a four-month procurement process, ESB Networks are planning to issue contracts to successful applicants towards the end of 2025.

The main deliverables under this milestone for 2025 are:

- Issue contracts to Flexible Service Providers

As energisation deadlines⁷ are set at 32 months post contract signing, these assets are expected to provide a flexibility product in 2028.

6.2.2 XLEU product

ESB Networks is working on a Lighthouse Proposition for Extra Large Energy Users (XLEU's) that could see these customers reduce their existing demand on the electricity distribution system at times of high demand by switching to onsite generation through Biomethane.

Broadly, the scope of the lighthouse project is:

- ESB Networks to agree a flexibility contract with an XLEU for demand reduction at peak times for a specified period (to be agreed).
- Given the potential duration of the demand reduction (possibly 4-6 hours per day), the expectation is that the XLEU would use gas generation as its back up supply source.
- To ensure that such a flexibility agreement did not result in increased emissions, the expectation is that the XLEU would need to demonstrate that its generation was using renewable fuels – this would most likely be in the form of green gas certificates.
- It is also anticipated that the Lighthouse project will seek to test operations at times of high carbon within the Wholesale Electricity Market as a secondary use case.

6.2.2.1 XLEU product (commence operation) (2025)

ESB Networks is seeking to work with a customer and all stakeholders to assess the readiness of this Proposition in 2024. The target is to be market ready with a contract for the customer to sign by end of 2024 and to begin operations by early 2025, in line with the Multi Year Plan. This product is a key initiative in electricity-gas cross-sectoral co-operation.

The main milestones for 2025:

- Commence operations (schedule, dispatch, post event analysis) with the Lighthouse customer. Note operational go live is dependent on the customer, through their supplier relationships, who is responsible for agreeing flexibility in their electricity and Gas consumption consistent with the ESB Networks Flex contract.
- Contribute to overall emissions reporting through validation and settlement on the electricity meter.
- Run R&D lighthouse for a period to be agreed with all Stakeholders and the customer to gain learnings across seasons.

6.2.2.2 XLEU products (Scaled) (2026)

From the initial Lighthouse project (described in section 6.2.2), we intend to leverage learnings to develop a proven product that can be rolled out across the XLEU customer

⁷ For assets not yet connected

base. The intention is to scale the offering in a standardised manner to all eligible large energy users to facilitate decarbonisation and sustainable growth. Our lighthouse project, with a single customer, will establish what this product could look like and what would be required to bring this to market more broadly. As such this will not commence until the Lighthouse project is up and running with a customer in 2025.

It is envisaged that R&D lighthouse will run for 12 to 18 months to gain learnings across seasons. These learnings will inform product design and how we may scale this with more customers.

6.2.3 Flexible Demand Connections

ESB Networks is developing processes and policies for new flexible demand connections which will allow customers to connect to the distribution grid in areas where the network is congested, but where there are no immediate plans for network reinforcement. Flexible demand connections include:

- Timed connections (e.g., capacity is restricted within specific time periods);
- Limiting import for periods of high demand on a more dynamic basis – linked to real time load and network configurations – and in response to direct signals.

This initiative aims to streamline network connections, balancing speed and reliability for users while also delivering on the NEDS action 2.7: Maximum Import Capacity flexibility.

In 2024, ESB Networks issued an expression of interest (EOI) for Flexible Demand Connections that, while restricted at times, would enable quicker connections to the network. Expression of interest for 37 sites were received. The responses to this EOI are currently under review and ESB Networks is engaging with customers to develop the products.

6.2.3.1 Issue Offers for MVP Timed Connections (for Demand) to respondents of EOI (2025)

In the EOI it was outlined that the first phase would be the simplest form of flexible demand connections (i.e. Timed Connections). While it is hoped to issue the first connection offer by the end of 2024, throughout 2025 the product will be further developed to deliver for additional use cases.

The milestone deliverables for 2025 are as follows:

- Develop a minimum viable product and issue timed connection offers – developed to reflect local network conditions and load profiles – to suitable respondents of the EOI.

Some of the learnings are expected to include:

- Operational considerations – i.e. how does this work in practice.
- Commercial viability i.e. is this a useful option for customers.

6.2.3.2 Develop an MVP and Issue first offers for a Flexible Demand Connection (2025)

As outlined above, there is potential to enable flexible connections with a reduced level of flexibility required from the customer by using a more dynamic approach to managing the network constraint associated with their connection.

The milestone deliverables for 2025 are as follows:

- Develop a sandbox for flexible connections, including interim processes for network assessment, operational processes, and commercial considerations, to enable flexible demand connections that would meet the needs of customers suitable for a dynamic flexible connection. Quantify the number of connections that could be managed through this sandbox.
- Obtain approval from the CRU to make this MVP offering available to a number of customers.
- Subject to CRU approval, and interested customers, issue flexible connection offers to customers.

6.2.3.3 Launch Interim solution for Flexible Demand Connection offerings (2026)

Following the learnings obtained from exploring the minimum viable products for timed and flexible connections with EOI applicants, make these offerings available on an interim basis to more customers.

The milestone deliverables for 2026 are as follows:

- Compile interim proposals for timed and flexible connections based on
 - Meeting the needs of a reasonable number of potential applicants for new/increased connection
 - An assessment of the processes and systems required to support the interim proposals.
 - An evaluation of the capacity of existing systems – such as operating systems – to accommodate these changes.
- Present a set of recommendations to the CRU for Interim Flexible Connection offers.
- Subject to CRU approval, and limitation of numbers, launch the product based on the interim arrangements to all customers (possibly through a second EOI).

6.2.3.4 Develop a Framework for Enduring Flexible and Timed Demand Connections (2026)

Incorporating flexible demand connections into the BaU strategy is expected to maximize the utilization of the current distribution system infrastructure to support the growing electrification of loads and is also aligned with the goals outlined in CAP24, further driving ESB Networks commitment to sustainable climate and energy objectives.

To deliver this milestone by end 2026, several key actions will be taken:

- Assessment of the impacts of load profiles on network congestion in a location and identification of load shifting strategies to optimise the use of the system.
- Establishment of enduring operational procedures to accommodate the flexible network operation of flexible demand connections. This work will also identify any limits to numbers of flexible connections which can be accommodated in advance of a fully automated operations system.
- Addressing key policy decisions to form the basis for flexible demand connections into the future.
- Establishing contractual terms and conditions which may be more appropriate to such connections.
- Ensure that future operations systems facilitate the roll out of flexible connections at scale.
- Initiate a number of early flexible demand connections.

The milestone deliverables for 2026 are as follows:

- In conjunction with CRU, consult on the proposals for flexible connection offers (including dynamic and timed) to be made available for customers on an enduring basis.

6.2.3.5 Phase One Implementation of the Flexible Demand Connections Framework (2027)

Following from the consultation on flexible connection offers. Progress the transition to implement the outcome of the consultation:

The milestone deliverables for 2027 are as follows:

- Review the outcome to the consultation and produce a recommendations paper to the CRU for the implementation of flexible connection offers that can will be made available on an enduring basis.
- Modify, to the extent possible, any interim offerings that are available to the market.
- Put a detailed plan in place for the enduring flexible demand connections.

6.2.3.6 Phase Two Implementation of the Flexible Demand Connections Framework (2027)

Based on the detailed design for implementation, carry this out in 2028 and 2029. The timeframe for full implementation will be confirmed as part of the detail plan in 2027.

6.2.4 Develop Flexibility Market Products

ESB Networks is continuing to explore and develop other market products which can be used to address congestion in other ways in addition to increasing customer awareness and by doing so stimulating market liquidity.

As outlined throughout this Multi Year Plan, the availability of flexible demand is a key element of our strategic plan in supporting the delivery of the Climate action Plan.

6.2.4.1 Explore demand up flexibility products (2025)

As the level of renewable generation connections on both the distribution and transmission systems increase, there may be value in customers increasing demand at times when renewable generators might otherwise be constrained. ESB Networks will explore whether a demand up product is useful to the DSO to manage network congestion.

The main deliverables under this milestone in 2025 are:

- Explore if a demand up product is feasible and useful from a distribution network perspective.
- If a demand up product is deemed feasible and useful, ESB Networks will develop a demand up product including financial model and flexibility market rules.

These deliverables will contribute to our overall strategy by reducing the number of renewable generators that need to be constrained on the distribution system. This would then contribute to the CAP targets, and it would benefit the whole of system.

6.2.4.2 Beat the Peak Business (2025)

The 2024-28 Multi Year Plan referred to Beat the Peak Commercial Active and the new iteration of this is called Beat the Peak Business. This initiative was launched on the eTenders platform in Q4 2023 and is still open for applications. It 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). As peak load on the distribution system also typically occurs between 4.30-7pm, these services will minimise local network congestion.

The main deliverables under this milestone for 2025 are:

- Continue engagement with potential Flexible Service Providers
- Assess tender applications and contract for flexible demand under the scheme.

The main deliverables in 2026 - 2030 are;

- **Creating new customer products:** This milestone relates to the development of new initiatives, products or services to support customers on their journey towards greater understanding and proactive energy management. This may include partnerships with suppliers, aggregators and/or energy innovators.

6.2.5 FlexCharging EV initiative

These deliverables contribute to our overall learning related to EVs and Flexibility Markets and contribute to our ability to reach our 2025 and 2030 Climate Action Plan demand flexibility targets.

6.2.5.1 FlexCharging EV initiative (2025)

FlexCharging are a company offering EV Charging Flexibility services and aggregation. ESB Networks and FlexCharging are currently engaged in a 12-month research proof of concept. FlexCharging uses vehicle telematics to manage charging through the car rather than through the charger. The proof of concept involves ESB Networks setting charging schedules and FlexCharging implementing these schedules to the recruited EV owners.

The main deliverables under this milestone for 2025 are:

- **Flexible Capacity:** manage the flexible capacity of the recruited EVs. This includes sending different schedules to different groups based on the optimal available capacity of local stations.
- **Data analysis:** monitor performance and assess the potential for EV flexible demand.

6.2.5.2 New EV initiative (2025)

The main deliverables under this milestone for 2025 are:

- Taking the learnings from the Flex Charging Pilot. Develop and launch a new smart charging flexibility product and/or service and ensure the delivery is fair and effective in enabling demand flexibility through EVs. (Delivering on NEDS Action 2.13)

6.2.6 Distribution Level Measures to Optimise Whole of System Management

These milestones recognise the interconnected nature of modern power systems and seeks to leverage the unique capabilities of DERs at various levels of the grid, aligning with current ESB Networks' strategy towards increased renewables, capacity flexibility, and decarbonisation targets set by the Climate Action Plan 2024 (CAP24) ⁸. In particular it focusses on complementing existing market-based products introduced by TSO.

6.2.6.1 Facilitate distribution customers to participate in TSO markets (2025)

The increased integration of DERs to provide grid support services such as frequency and voltage control, and services addressing congestion, represents a significant shift in power system management, and coordination between DSOs and TSOs is required to unlock the full potential of these distributed assets. This milestone aims to streamline the participation of DSO-connected assets in TSO ancillary services markets, paving the way for a more flexible, resilient, and efficient grid.

The solution extends beyond the simple participation of assets in the TSO markets by including future plans to automate real-time network studies and define essential data exchanges for TSO-DSO collaboration, resulting in increased power system security and whole-of-system optimisation.

⁸ [Climate Action Plan 2024](#)

The main deliverables under this milestone in 2025 are as follows:

- Continue regular joint TSO-DSO working group sessions to share updates on progress on operational initiatives. For example:
 - TSO – provides DSO with regular updates on their progress in terms of increasing System Non-Synchronous Penetration (SNSP) – currently at 75%, targeting 80% by 2030.
 - DSO – provides updates to TSO on progress on development of operating systems; progress on standards for small scale generation.
- Development of new mechanisms to identify and address barriers to increasing DER participation in TSO ancillary services markets. The introduction of Dynamic Instructions Sets (referenced in Section 5) is an example of this work. Work will be ongoing in 2025 and beyond to improve this initiative.
- A number of other initiatives are described in 6.2.6.2 and 6.2.7.1.

6.2.6.2 Implement capabilities for reactive power control (TSO) (2027)

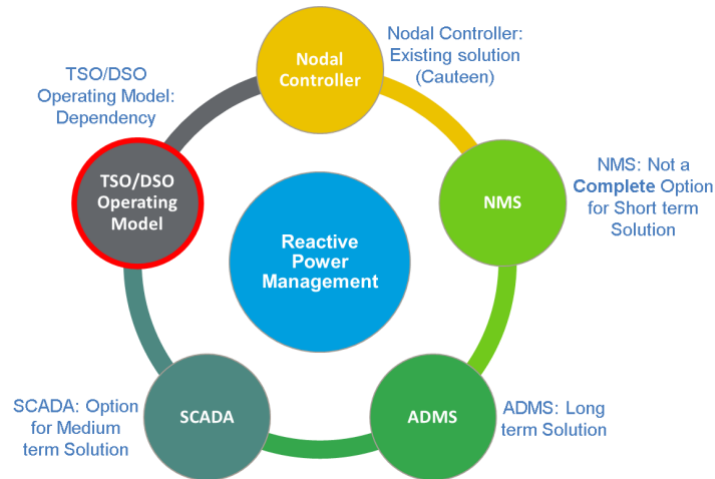
A pathway for the optimization of dispatch operations can be achieved by enhancing the utilisation of the reactive power capabilities on the distribution network and co-ordination of reactive power exchanges at the DSO/ TSO interface. The efficient control of reactive power reduces the necessity to run conventional generation on the transmission system for voltage support thereby creating more 'headroom' for renewable generation.

To enhance dispatch operations, the TSO and DSO have been respectively, and jointly, investigating strategies and solutions to utilise the reactive power capability of distributed generation. Figure 3 illustrates the initial methods proposed for delivery of the reactive power solution, also highlighting the operating model as a key dependency, these methods include:

1. The Nodal Controller is a pilot technology that was developed by ESB Networks with the support of EirGrid to develop the key algorithms and principles under which reactive power could be delivered to the transmission system by particular classes of distribution connected parties. This is currently in place at one location.
2. Network Management System (NMS) was considered as an interim option but has limitations in autonomy and speed of response in its current stage.
3. Advanced Distribution Management System (ADMS) – once available – is proposed as the enduring solution. However, an interim solution is required in the medium term.
4. Following an assessment of all the options, an application of the Supervisory Control and Data Acquisition (SCADA) system looks to provide the most promising options as an interim solution which will facilitate voltage support on the transmission system. Investigations are continuing however if approved this application will build on the logic developed through the Nodal Controller logic.

The TSO/DSO Operating Model for reactive power management between the TSO-DSO, which has not been defined for reactive power to date, is also a critical component for completion of this task.

Figure 3: Analysed methodologies for reactive power management



In advance of delivering this milestone in 2027, the following will be delivered in 2025:

- Develop a method of settlement and procurement from service providers through FASS proposal.
- Progress the DSO/TSO High Level Design on the reactive power coordination model(s).
- Detailed design of SCADA solution developed.
- Develop annual review process for assessment of reactive power settings – adjusting of Power-Voltage curves (PQ curves) of the windfarm power stations.

2025 - 2026:

- Select final location for implementation of reactive power control solution.
- Development of an implementation plan for delivery of the model(s) and trialling its application.

2027

- Trial and hyper care of the reactive power coordination model.

6.2.7 Develop Capabilities to Manage Challenges presented by DER at scale

The number of DERs installed on distribution networks has been rapidly increasing in Ireland but the growth of uncontrolled micro, mini, small-scale generation installations has the potential to present future challenges to transmission and distribution networks, affecting the electrical network’s security and reliability.

The introduction of enhanced DER capabilities – in particular in the area of visibility – is expected to assist in the goal of reducing dispatch down of renewable energy to below 7%.

6.2.7.1 Commence implementation of required capabilities for visibility, controllability and forecasting of DER (2025)

Improving the visibility, controllability and forecasting of small scale DERs connected to the distribution network will provide the capability of TSO and DSO to deal with emergency conditions and will therefore improve network stability, reliability, and security.

To deliver this milestone in 2025, several key actions will be taken:

- Develop and agree ESB Networks' position with regards to necessary levels of DER controllability and visibility.
- Develop use case scenarios for control of small scale DER's.
- Develop operating protocol for control of DERs < 1MW.
- Develop scope of work for power system modelling incorporating projected PV penetration levels.
- Report to CRU on the operational impact of high penetration of micro-generation.

Further work will be done in 2026 to develop and agree control techniques appropriate to DER types and technologies.

6.3 Transparency and Reporting Milestones

The below milestones have been identified as mechanisms to increase the transparency of market development and market activities. It is a growing and critical element of our role as a neutral market facilitator. Transparency and reporting milestones are designed to provide customers, market participants or prospective market participants with:

- Assurance that markets are developed and operated in a fair and non-discriminatory manner.
- Line of sight of future opportunities to participate in markets.
- Line of sight of future opportunities to influence market design and development.

6.3.1 Behind-the-Meter Standards

Engaging the industry in developing BtM standards is crucial. The milestones below set out the various initiatives which will assist in shaping consensus on interconnection standards, architecture, and recommended practices.

6.3.1.1 CRU approval of proposals for mandatory flex readiness standards for DER connection to the Irish distribution system (2025)

The development of a standardised behind the meter interconnection architecture and associated standards will provide ESB Networks with the required level of interoperability and control of Behind the Meter distributed assets to maintain grid operation stability and deliver on climate action targets. Flex readiness standards for DER interconnection also ensure that customers are provided with clear, and timely, transparency as to the data and signalling requirements associated with new DER technologies in order to be part of a flexible electricity system, and to participate in flexibility or provide services.

The proposals will consist of the following:

- Interoperability communications standard.
- Set out defined requirements and use cases for Behind the Meter assets.
- Engage with regulatory and all key stakeholders on developing required policy and/or legislative updates required to support these interoperability standards.
- Progress developing and embedding the standards at an industry level.

The main deliverables under this milestone in 2025 are:

- Agree and mandate the technical standard as IEEE 2030.5 for BtM inverter connected DER dispatch – following network pilot demonstrations.
- Support the adoption of IEEE 2030.5 with supportive network use cases and the provision of an overview technical architecture approach.

By supporting customer readiness, delivery of this milestone will also support national electrification strategies and the goals outlined in CAP24, further driving ESB Networks' commitment to sustainable climate and energy objectives.

6.3.1.2 Publish updated technical architecture and standards governing the interconnection of behind-the-meter DER systems (2026)

As described in section 6.1.1 and prior to ESB Networks introducing Behind the Meter standards, it is essential to test the end-to-end architecture options with pilot technologies on the network. This will provide the technical/commercial groundwork and detail to demonstrate the requirements needed to successfully integrate this technology. This will then be the vehicle to inform our key stakeholders on the new standard for integrating behind the meter capabilities. It will also drive the development of consensus for a Behind the Meter interconnection standard and architecture, recommended practices (potential grid code modifications – if required)), and guidelines that can ease the deployment for customers and electrical installers.

The main deliverable under this milestone for 2026:

- Publish the technical architecture and standards governing the grid interconnection of Behind the Meter DER resources.

Like earlier milestones, publishing technical standards for Behind the Meter DER is expected to ensure that customers are provided with clear, and timely, transparency as to the data and signalling requirements associated with Behind the Meter DER technologies.

6.3.1.3 Requirements to inform detailed design of dispatch architecture integration with enduring solution (2026)

In 2025 (reference section 6.1.1) ESB Networks will look to pilot and test a range of target Behind the Meter architectures to integrate and standardise inverter-based technologies for use on the Irish distribution system. This will provide the technical groundwork and detail to inform commencement of detailed design for the Behind the Meter dispatch architecture for an enduring solution.

The main deliverables under this milestone for 2026 are:

- Collating the technical data from pilots to inform the design criteria for the Behind the Meter dispatch platform.
- Building the OT integration design requirements for the Behind the Meter dispatch platform enduring solution.

Incorporating the Behind the Meter dispatch infrastructure into the OT landscape will facilitate the network integration and control for Behind the Meter assets for the enduring solution.

6.3.2 Planning the Power System incorporating flexibility and measuring the success of flexible services

ESB Networks and external stakeholders recognise the importance of providing the market with line of sight of where flexibility services may be procured, thereby supporting market stimulation and liquidity.

It is also vital to measure the success of embedding flexibility within Irish society. The following milestones set out the work being done to deliver on this commitment.

6.3.2.1 Publish Multi Year Flexibility Needs Statements (Network Scenario Headroom Report) (2025)

The Network Scenario Headroom Report will be published annually with the first publication due by early 2025. The Headroom report will identify the capacity available, or the capacity shortfall, at each location under a number of different scenarios and for a 10-year period. Where there is a shortfall in capacity this can flag a possible flexible service need in this location.

In addition to the Network Scenario Headroom Report, a Network Development Report will be published every 2 years. The exact format of this report is still under review however – in line with reports published in other jurisdictions – the report will take the output data of the Network Scenario Headroom Report and identify reinforcement and flexibility requirements at each location nationally and will:

- Flag or ‘Signpost’ the Flex requirements (Location, quantity, scenario (e.g. best view), Flexibility Product (e.g. Sustain/Dynamic/Secure/Restore/Other))
- Flag the network reinforcements projects planned over years 1-10 (PR6 and PR7)
- Identify the current stage of development of the reinforcement project.

The main deliverables under this milestone in 2025 are:

- Publication of the Network Scenario Headroom Report

6.3.2.2 Embed a measurement framework to capture insight, health and success of embedding flexible demand products and services into Irish Society (2026)

ESB Networks recognises the requirement to build awareness, education and understanding for flexible demand so as customers will be in a position to adopt flexible demand products and services (regardless of who is offering these services). This milestone relates to tracking and understanding the changing attitudes and behaviours across customer awareness and adoption of flexible demand products and services, monitoring and tracking the effectiveness of initiatives and propositions and how customers are progressing through the journey towards proactive management and the overall contribution of customer engagement initiatives to 2033 flexibility targets.

The main deliverables under this milestone for 2026 are:

- Define a research and measurement approach to support ongoing monitoring of the engagement with our initiatives, gathering clear and actionable learnings about our customers, and measuring the tangible impacts for customers.
- Establish KPIs to support understanding of incremental progress towards behavioural change targets.
- Embed research and data capture to understand behaviour change and customer awareness and understating of Demand Side Flexibility (e.g. Social Listening, Quarterly Attitudinal Tracking, Focus Groups, etc.)
- Generate insights from research and measurement to enhance design of commercial and domestic products, services and awareness and education initiatives.

6.3.3 Collaboration with EirGrid

As noted in Section 6.2.6 modern power systems are very interconnected. Co-operation and collaboration between EirGrid (as Transmission System Operator) and ESB Networks (as Distribution System Operator) is now more important than ever to optimise the use of the network infrastructure and our renewable energy.

An understanding of how the markets can interact is also important if ensuring best value for the Use of System customer.

6.3.3.1 TSO/DSO Coordination: particular focus on the joint operating model (2025)

With the implementation of the DSO Flexibility Market, DSO and TSO must be able to coordinate, monitor and dispatch resources as well as study and share information in a timely manner. The increased penetration of DER's, as well as the growth of Flexibility Market Services, is enabling DER's to provide grid services to both system operators, which poses new grid management challenges to ensure system security and stability.

ESB Networks will support the continued enhancement of the TSO/DSO Coordination model in place at ESB Networks, by aiming to ensure the optimal management and coordinated operation of both the distribution and transmission system.

As part of the main deliverables under this milestone in 2025, ESB Networks will support the following:

- Define and coordinate a one-team integrated approach for a continued evaluation over the operation and performance of the model.
- Support the continued development and standardisation of information exchange procedures, including the review of data sets and signals for exchange and governance framework for continuous refinement.

For the delivery of this milestone in 2027 onwards, several key actions are expected to be taken:

- Develop operational data due diligences to evaluate the value of data exchange.
- Support initiatives to maintain data quality exchange over time.

The TSO-DSO model is expected to undergo a continued transformation with a focus on enhancing market services and promoting thorough information exchanges, aiming to facilitate system-wide optimization and a more balanced, efficient distribution system.

6.3.3.2 Analysis of implications of Celtic Interconnector (2026)

The Celtic Interconnector is expected to be operational in 2026/2027. This interconnector will link Ireland and France and will allow for exchange of up to 700MW of electricity between the two countries. Once the interconnector is operational, Ireland will be recoupled to the EU wholesale energy markets which will have implications for existing energy market processes and systems in Ireland. ESB Networks analysis will focus on potential impact on the flexibility market.

The main deliverables under this milestone for 2026 are:

- Analyse the potential impact of the Celtic Interconnector, including new wholesale market arrangements, on the distribution flexibility market.

These deliverables contribute to our overall strategy by ensuring that the distribution flexibility market aligns with, and supports, other energy markets.

6.3.4 Engagement with Industry partners

ESB Networks is aware that the energy transition of the scale intended requires co-operation and collaboration across many different areas. This includes collaborating with utilities across the world and research institutions but also – and of key significance – our industry partners including suppliers; aggregators; energy consultants and our customers. This section sets out some of the ways that we work with industry.

6.3.4.1 Engage with Flexible Service Providers in learnings review of the Flexible Market System experiences (2027)

Following on from the implementation of the Flexibility Market System in 2026 (discussed in Section 6.1.3) which will support the growing flexibility markets, ESB Networks will begin a review exercise in 2027 with external Flexible Service Providers and users of the

Flexibility Market System. The purpose of this review exercise is to engage with Flexible Service Providers and understand their experience of using the external portal of the Flexibility Market System.

The main deliverables under this milestone for 2027 are:

- Structured engagement with Flexible Service Providers who wish to provide feedback on their experiences.
- Documenting any positive and negative experiences of participants to potentially address any challenges being encountered.

These deliverables contribute to our overall strategy by supporting the operation of the Flexible Market System which is a key deliverable to assist with achieving the 20% - 30% Flexible Demand by 2030.

6.3.4.2 Development & Industry Adoption of DSO-Market Participants Transition Model (2025-2026)

The development of an agreed approach to transition those activities from the DSO to market participants is an important deliverable under the Multi Year Plan. In 2024, ESB Networks progressed with a review of the development of market arrangements for flexibility in other jurisdictions which looked at flexibility market activities, roles and responsibilities of market actors, key drivers for flexibility, etc. Over the course of 2025-2026, ESB Networks intends to build on this initial work and work with market participants at the CRU to develop a comprehensive plan and agree transition model.

Key deliverables:

- Initial market engagement:
 - ESB Networks will undertake engagement with external stakeholders on the international market analysis conducted over the course of 2024.
 - Further, ESB Networks currently envisages undertaking a 'call for input / evidence' on industry's view of key barriers and blockers to a market-led flexibility approach.
- Review of engagement:
 - ESB Networks will conduct a review of feedback and input from external stakeholders which will inform development of ESB Networks' plans regarding this deliverable.
- CRU engagement:
 - ESB Networks will work with CRU to develop and agree proposed plan / actions / sequencing of events / roles & responsibilities to inform the transition model, including:
 - Re-engagement with key external stakeholders to inform development of proposed plan.
 - Incorporate into relevant plan (e.g. Blueprint, roadmaps, NEDS, etc.)

6.3.5 Standard Market Regulatory Reporting

The below initiatives highlight some of the key and ongoing mechanisms adopted by DMSO to engage with and inform our key external stakeholders.

6.3.5.1 Outturn report (2025)

The NN, LC programme standard method of reporting on its Flexibility Multi Year Plan is the development and submission of an annual outturn report to CRU. The annual outturn report details how ESB Networks have met or failed to meet milestones earmarked in the previous year. The level of incentives allowed to be recovered by ESB Networks is based on a combination of a balanced scorecard, set by the CRU, and a self-assessment against same conducted by ESB Networks. A final determination on the incentives to be recovered is then made by CRU based on the outturn report.

6.3.5.2 NN, LC Advisory Council (2025)

The NN, LC Advisory Council⁹ was established in 2022 with the objective of bringing together key external stakeholders to guide and inform the NN, LC on programme decision making and policy development. Membership of the Advisory Council is made up of a diverse range of external stakeholders including representatives from CRU, DECC, SEAI, aggregators, county councils, electricity suppliers, etc.

The NN, LC Advisory Council terms of reference¹⁰, published on the NN, LC website, provides more information on the remit, membership, principles and scheduling and format of the Council.

ESB Networks leverages the NN, LC Advisory Council not only to guide and inform programme decision making and policy development but also to report on progress and key initiatives, propositions, being progressed by the programme and to elicit feedback from members as to how ESB Networks can improve in all aspects of delivery and engagement on same. More information on the NN, LC Advisory Council and content presented can be found at this link [Our Advisory Council \(esbnetworks.ie\)](https://www.esbnetworks.ie/our-advisory-council).

ESB Networks – through its DMSO Design team – also periodically conducts external engagements on the programme via various means including ad hoc webinars, and roundtables, to communicate with our external stakeholders and to obtain feedback which could inform development of such initiatives.

6.3.5.3 National Energy Demand Strategy (NEDS) (2025)

ESB Networks remains a key stakeholder of the CRU's National Energy Demand Strategy (NEDS) programme and we have informed to a large extent the development of the CRU NEDS decision (CRU202467)¹¹ published in July 2024.

⁹ [Our Advisory Council \(esbnetworks.ie\)](https://www.esbnetworks.ie/our-advisory-council)

¹⁰ [Advisory Council \(esbnetworks.ie\)](https://www.esbnetworks.ie/advisory-council)

¹¹ [NEDS Decision Paper and Annex.pdf \(divio-media.com\)](https://www.divio-media.com/neds-decision-paper-and-annex.pdf)

ESB Networks is a member of a number of NEDS governance groups (including the NEDS Working Group and NEDS System Operators' Group), and we regularly report on programme progress and deliverables at these sessions. Moreover, ESB Networks will be represented on the newly established NEDS Implementation Group and will report, via this forum, on progress delivering those actions where we are designated as the Responsible Body within the CRU's NEDS decision. Further, ESB Networks has also been designated as a Supporting Body for 14 actions in the NEDS decision and ESB Networks is committed to providing our support and input to those NEDS actions which are not being led directly by ESB Networks.

ESB Networks will continue to report on our progress via the NEDS governance groups into 2025 and beyond as the NEDS progresses into the next phases of the programme.

6.4 Evolving Actions

In addition to the above milestones, there are several initiatives that have arisen out of more recent stakeholder engagement and consultation as well as evolving regulatory needs. These include:

- A residential storage pilot – ESB Networks will explore opportunities to support the uptake of domestic battery energy storage systems which seek to identify economic advantages to consumers, through maximising the use of renewable generation or by 3rd parties using the battery to provide grid services.
- Leveraging Smart Metering capability to support the CRU National Energy Demand Strategy (NEDS) – this work will seek to identify a number of opportunities across ESB Networks to leverage the Smart meter data in supporting ESB Networks objectives facilitating:
 - Smart Services
 - Demand Flexibility & Response
 - Flexible Connections

The NEDS Decision Paper has also highlighted actions for which ESB Networks will be the lead. These actions are currently being assessed for implementation, for example:

- Engagement with relevant parties to develop propositions for smart charging services, including an exploratory investigation of vehicle-to grid (V2G) services.
- Developing products which support EV fleet charging.
- Develop and publish technical assessment of how the available smart EV charging and V2G capacity can be maximised through network operations.

The above-mentioned initiatives may be incorporated into broader technology and sector agnostic arrangements in supporting build of a deep and competitive environment. All initiatives will be developed with a customer centric approach identifying value from both a customer and societal perspective.

6.5 2028-2029 High-level Milestones

Table 3: 2028-2029 High-level milestones

PR5 Objective	Date	Milestone	Description
Non Wire Alternatives	2028 - 2029	DSO Flexibility Auction Platform for day-ahead, intraday and peer-to-peer trading	By 2028/2029, ESB Networks anticipates a level of flexible demand in line with the Climate Action Plan. With that level of flexible demand available, ESB Networks will introduce an auction platform where market participants can trade flexibility using a variety of mechanisms. This will range from long term contracts to short term contracts, day ahead and intraday trading, as well as peer to peer trading.
	2028 - 2029	Capital reinforcement deferral process adopted as BaU	This process is described in section 6.1.6. Once this process is established and agreed there will be ongoing need to compare capital reinforcement and flexible solutions.
New Products and Services	2028 - 2029	Proposals for enduring flexibility market arrangements to the CRU	By 2027/2028, through continuous development and testing in the market sandbox and flexibility market, we expect that sufficiently mature proposals for formal regulatory adoption can be provided, offering a baseline for more formal industry governance thereafter of development and adaptation of flexibility market products and services.
	2028	Targeted customer awareness & education services	As described in Section 6.1.7 there will be an ongoing need to provide information to customers to maintain awareness and advise of updates

PR5 Objective	Date	Milestone	Description
Transparency and Reporting	2028	Refresh roadmap of energy lifestyle applications	ESB Networks will review what technical enablers are required to support customers to engage with demand side flexibility. These applications can range from developing gamification, flexibility calculators or other mechanisms. Post review we will plan technical design, build and roll out any new initiatives
	2028 - 2029	Submission of enduring market rules to the CRU	ESB Networks intends to submit a final set of market rules to CRU for their approval and adoption in the flexibility market

6.6 Superseded Milestones

Table 4: Superseded milestones

Date	Milestone	Status	Rationale for supersession if applicable
2025	Complete the phased competitions for the full CAP 2025 target volume of large-scale multi year multi-hour-duration flexibility	Ongoing	Milestone replaced with the “Launch procurement process for Demand Flexibility Product” milestone.
2025	Monitor & Grow Vulnerable Customer Participation	Ongoing	Milestone now covered under the “Initiatives to build awareness, education and engagement with demand side flexibility for Domestic Customers in 2025 – 2030” milestone.
2026	Behind-the-Meter Infrastructure: Automated Flexibility Services Partnerships	Ongoing	As noted in 5.1.1 Depending on the level of market readiness, where feasible we will look to coordinate the technical development with development of flexibility markets and associated systems to allow trialling of an end-to-end approach to delivering flexibility services through the market.
TBC*	Energising initial storage operators in flexibility market * Pending regulatory process and market readiness	Ongoing	As described in section 6.2.1

7 Proposed Scorecard

The CRU has introduced an annual balanced scorecard based on ESB Networks’ development and execution of this plan to enable customers actively participate in a flexible distribution system. This approach is based on the high-level milestones that were agreed by ESB Networks to reflect the following parameters:

- Introduction of non-wire alternatives;
- Establishment of standard products and services to the benefit of all system users; and
- Establishment of robust reporting and transparency arrangements.

The incentive is also in line with the requirements of Article 32 of the Electricity Market Directive 2019, 2019/944 (Incentives for the use of flexibility in distribution networks).

In September each year, aligning with its consultation with stakeholders, a detailed Multi Year Plan covering the three following years (and the two years after at a high level) must be submitted to the CRU by ESB Networks. Based on the submission, the CRU will decide, by year-end, on the milestones, deliverable targets and weightings for the following year.

In assessing the outcome of performance, the CRU will consider the following criteria:

- Quality of the plan and defined actions (20% of scoring);
- Quality of implementation of the plan (40% of scoring); and
- Effectiveness of the plan and demonstrable impact (remaining 40% of scoring).

7.1 Proposed 2025 Milestones to be incentivised

The following table sets out how the proposed 2025 flexibility milestones align to the most up-to-date balanced scorecard. Key Flexibility Milestones for 2025 are aligned against the CRU’s Flexibility Balanced Scorecard Objectives.

Upside and downside weightings associated with each aspect of the scorecard have been proposed based on the estimated aggregate customer impact of the milestones set out under each element of the scorecard.

Table 5: Proposed Balanced Scorecard

PR5 Objective	2025 Milestone	Upside (€m)	Downside (€m)
Non Wire Alternatives	Pilot End-to-End Behind-the-Meter Architecture	1	0.33
	Tender for locational summer flexibility to assist with outage management		
	Review further potential options for DSO demand flexibility products		
	Procurement of a Flexibility Market System		

PR5 Objective	2025 Milestone	Upside (€m)	Downside (€m)
	Plan to Optimise EV fleet charging		
	Initiative to Deliver Network Capacity in a localised Area Via a Non-Wire Solution		
	Route to market for community-based flexibility participation		
	Initiatives to Build Awareness, Education, and Engagement with Demand Side Flexibility for Customers		
New Products and Services	Launch Request For Tender for the Demand Flexibility Product	1	0.33
	XLEU product (commence operation)		
	Issue Offers for MVP Timed Connections (for Demand) to respondents of EOI – delivering on the NEDS action 2.7: Maximum Import Capacity flexibility		
	Develop an MVP and Issue first offers for a Flexible Demand Connection.		
	Explore demand up flexibility products		
	Beat the Peak Business – review and revise as needed		
	Complete learnings from FlexCharging EV initiative		
	Develop a New EV initiative (In line with action 6.2.5 under the National Energy Demand strategy (NEDS),		
	Facilitate distribution customers to participate in TSO markets		
Commence implementation of required capabilities for visibility, controllability and forecasting of DER			
Transparency and Reporting	CRU approval of proposals for mandatory flex readiness standards for DER connection to the Irish distribution system	1	0.33
	Publish a technical assessment of how the available smart EV charging and V2G capacity can be maximised through network operations. (NEDS 2.17): Q2 2025		
	Engage across relevant parties to develop propositions for smart charging services, including an exploratory investigation of vehicle-to-grid (V2G) services. Establish working group to explore barriers and enablers. Publish programme of work. (NEDS 1.3): Q4 2025		

PR5 Objective	2025 Milestone	Upside (€m)	Downside (€m)
	Publish Multi Year Flexibility Needs Statements (Network Scenario Headroom Report)		
	TSO/DSO Coordination: particular focus on the joint operating model		
	Standard market regulatory reporting		
Total		3	1

7.2 Assessment

ESB Networks' proposed assessment against the criteria is discussed below: This has been developed to reflect the PR5 Regulatory Framework and Reporting (CRU/20/154).

7.2.1 Quality of the Plan and Defined Actions

ESB Networks proposes that the quality of the plan and defined actions are measured by:

- Independent quality assurance, delivered by an independent third party;
- Demonstrable adherence to the defined programme delivery method/approach;
- Demonstrable and robust risk, assumption, issue and dependency management.

7.2.2 Quality of Implementation of the Plan

ESB Networks proposes that measurement of the quality of the implementation plan should be based on delivering the milestones set out in the scorecard (or alternative / equivalent activities where higher customer or regulatory priorities emerge within the year of delivery).

7.2.3 Effectiveness of the Plan and Demonstrable Impact

The effectiveness of the Flexibility Multi Year Plan, and demonstrable impact, will be assessed based on the customer and stakeholder impact of what is delivered, measured through a range of quantitative and qualitative approaches giving a holistic view of both the short- and long-term impacts achieved.

7.2.4 Considerations for 2025 Multi Year Plans

As network companies are in their fourth year of delivery under the PR5 regulatory framework, the CRU highlights the following points which network companies must incorporate when preparing their 2025 Multi Year Plan submissions:

- The proposals and deliverables to be included in the scorecards should be more outputs-focused as opposed to inputs-focused. The CRU acknowledges that some elements of the balanced scorecards contain some outputs-focused metrics already but would like to see network companies develop this further and propose deliverables that go beyond BaU with a clear focus on outputs for customers and

market participants. Proposals should also be clearly mapped to the objectives of each of the balanced scorecard incentives as originally set out in CRU20154;

- The proposals should be ambitious and stretching, building further on those previously included in the 2021, 2022, 2023 and 2024 balanced scorecards. The CRU expects to see progression from short-term planning and process activities to how companies are actually delivering the roll-out or deployment of technologies and solutions on the ground to address the PR5 objectives and wider Climate Action Plan 2030 targets;
- The Multi Year Plans should be standalone submissions that contain all the details needed for the CRU to set the balanced scorecards – each element of the scorecard should be detailed in terms of the actions (and expected impacts) the network company proposes to deliver as opposed to referring to external published plans;
- The quality of the Multi Year Plans submitted to the CRU forms part of the overall balanced scorecard assessment. As such, the CRU expects Multi Year Plans to be detailed and of high-quality to minimise the need for further queries on the submission when setting the balanced scorecards. Submissions that are incomplete, lack clarity or do not define clear actions to meet specific deliverables/ milestones impact on stakeholders' ability to effectively engage in the consultation process and the CRU's ability to set the balanced scorecards;
- Proposed balanced scorecard actions should not overlap with other incentives as the CRU will only reward relevant actions once. Where actions in a given balanced scorecard cover the same or similar topics to actions contained in another balanced scorecard, the network company should make it clear how actions differ both in terms of delivery and outcomes in order to be included in their respective balanced scorecards. Failure to do so will result in the CRU removing any duplications from scorecards;
- The post-consultation Multi Year Plan submissions should contain information on how the network company considered stakeholder views and how the Multi Year Plans were amended following stakeholder feedback.

8 Stakeholder Consultation and Feedback

There were 7 responses to the Call for Input on the Flexibility Multi Year Plan.

All of the respondents gave a positive response to the work being undertaken by ESB Networks (and also EirGrid) in addressing the climate challenge in a number of different ways. ESB Networks appreciate this support and will continue to engage with stakeholders and customers alike as is illustrated in our customer and stakeholder plans laid out in Section 6.1.7.

The first part of this section will set out ESB Networks response to some of the general comments and responses provided. The second part is in tabular form and will detail ESB Networks responses to some specific questions.

Technology

A number of respondents were from the technology sector and emphasised the importance of utilising new technology – both at the level of operating systems for the power system and at the domestic level including SMART home charging for Electric Vehicles (EV's). One respondent also noted the importance of working with EirGrid in developing a whole of system response and the importance of data in operating the system of the future.

ESB Networks fully agrees with the importance of technology in our transition and are committed to utilising technology, automation, and Artificial Intelligence (where available) to optimise the use of the network and facilitate participation in the markets by all customers. We acknowledge the importance of improved data and – for example through our own Visibility Programme – are working on improving the quality of our data. We are also working on implementing a flexibility market system (referenced in Section 6.1.3) with which our customers will interact directly and which in turn will interact with our operating systems.

Standards

A number of respondents agreed with ESB Networks on the importance of developing clear standards for Behind the Meter (BtM) infrastructure. This is vital in ensuring the DER's including EV's can participate fully in our markets.

ESB Networks welcomes this support and will continue to work towards ensuring the optimum standards are identified and adopted. This work is referenced in a number of different milestones documented in Section 6.

Electrification of Transport and facilitation of renewables

With regard to EV users in particular ESB Networks agree with the respondents who noted that these create both a challenge and a significant opportunity. ESB Networks are eager to explore mechanisms that can encourage consumers to plug in their vehicles (via

SMART Chargers) more frequently. Where the vehicle is physically connected to the system the times when the vehicle is actually charging can be tailored to times which takes account of network congestion, thereby enhancing our ability to manage grid requirements effectively. In some cases this may mean charging the vehicles at times when local renewable energy – such as rooftop solar for example – is high. As part of our research, in July 2024, we launched a research study with EV owners. The objective of this study is to understand customer behaviour around charging schedules and to test the reliability of EVs as a source of flexible demand, as well as the potential use cases for these EVs on our distribution system.

One respondent commented on the importance of using DER's such as EV's to manage load and thereby reduce the dispatch down of renewables. ESB Networks agree that the charging of EV's – if well managed – can have a key role in facilitating renewables.

In addition to working to develop the role that EV's can have in reducing the dispatch down of renewable generation, ESB Networks is planning for the connection of a very significant number of new renewable projects over the coming years and are working closely with EirGrid to improve the visibility, modelling and forecasting of DER's – currently with a specific focus on rooftop solar – with a view to minimising dispatch down of renewable generation.

One respondent noted the importance of hybrid connections. ESB Networks and EirGrid are fully committed to facilitating hybrid connections and agree that they are a key element in facilitating renewables. Work on this facilitation has been in train for a few years and continues primarily with a view as to how to accommodate within the existing markets.

Electrification of heat

One respondent noted the particular challenge represented by the electrification of heat and urged ESB Networks to consider all the options available to facilitate this transition including use of heat storage – which can be used in conjunction with direct electric heating from the grid and/or from PV panels.

Another respondent noted the importance of district heating and referenced one of the systems currently in place which uses excess heat energy to provide local district heating.

ESB Networks is factoring this transition to electric heat into our network planning for the future and are also considering other technology types – including heat storage and district heating – that may change the demand profile that we see over time. ESB Networks is supportive of such initiatives in providing a key element of Ireland's Climate Action Plan.

SMART Meters

Some respondents commented on the importance of SMART Meters and the use of SMART Price Plans in encouraging customers to use energy at times that are optimum to minimise congestion on the system and maximise the use of renewable energy. ESB

Networks is responsible for rolling out the SMART meter infrastructure and at time of writing over 1.8 million meters have been installed across the country. While the SMART price plans are a matter for each supplier to develop, ESB Networks has supported increased consumer engagement by the provision to each smart meter customer of half-hourly consumption and energy production data via the ESB Networks Online Account. ESB Networks is also actively encouraging increased take-up of smart meter exchanges.

The Role of the Customer

The majority of respondents noted the importance of an engaged customer in tackling the challenges presented by electrification and the introduction of flexible solutions. Some respondents also shared findings from their own research and experiences – which are always welcome.

ESB Networks is fully committed to maximising customer engagement and acknowledge (as noted by one respondent) that there are regional differences in awareness and the complexities involved in learning about peak energy usage. Section 6.1.7 sets out some of the plans that we are progressing to engage both domestic and non-domestic customers.

One of our domestic products already in operation, known externally as “Is This a Good Time?”, is targeted at building awareness and understanding of how customers can take control of their energy use. It rewards positive behaviour changes by encouraging customers to shift their consumption from peak periods to times when there is a surplus of renewable energy available locally.

In 2025, as part of our National Outreach Programme, we intend to build on this further. Amongst other initiatives – set out in more detail in section 6.1.7 the Programme will:

- support customer behaviour change, specifically mindful electricity use.
- start on the journey of behavioural change across customer segments and geographies.

With regard in particular to energy communities, we agree with the respondent who noted that these play a crucial role in promoting flexible demand products. To date we have worked in collaboration with SEAI to develop Ireland’s Electricity Community Toolkit, which aims to give the Sustainable Energy Communities across Ireland (approximately 800+) the tools to understand flexibility and start to incorporate insights into their energy plans. We will continue to support and collaborate with energy communities to enhance awareness and adoption of these products. In addition, the milestone described in section 6.1.7 refers specifically to this customer group.

ESB Networks share the vision set out by one respondent of a joint approach involving suppliers, emerging energy companies, aggregators, and energy innovators. Creating a level playing field for new providers to develop innovative solutions is essential. ESB Networks will foster a market/customer-led approach, encouraging innovation and sharing insights across market participants. The Advisory Council, and our involvement in the

NEDS' working group (described in Section 6.3.5 are examples of how we will continue to collaborate).

Energy Storage

Some respondents commented on the use of storage including Behind the Meter (BtM) batteries, heat storage (as referenced above), storage via water heating and EV charging. ESB Networks agrees that storage has a key role to play in the energy transition. While there is a particular piece of work focussed at present on the procurement of long duration flexibility (reference in particular Section 6.2.1)– which may be suited to large grid scale batteries – we are also supportive of BtM (dealt with in a number of our milestones in Section 6), and heat storage. In particular we are looking at eHeat and at how this can be accommodated on the system.

Continued engagement and pilots

Several respondents expressed their desire to work directly with ESB Networks on various initiatives. In addition to opportunities to provide market bids (where a Requirement for Tender is released) there are other initiatives which give customers and others the opportunity to engage with us. These include the recent Expressions of Interest for flexible connections; the ongoing engagement via the Advisory Council and the upcoming National Outreach Programme.

One respondent in particular encouraged ESB Networks to look at other technologies including other energy sources. ESB Networks agree that research and engagement with other utilities and agencies such as EPRI in the USA is important as utilities and agencies worldwide grapple with the challenge of Climate Change and electrification of energy.

Some respondents raised specific queries or provided specific recommendations. The table below sets out specific comments on these.

Table 6: Call for Input feedback/responses

Comment	ESB Networks' Response
<p>ESB Networks should consider the creation of digital twin models of all new DER technologies to fully integrate same into the future operating system. These models can be shared between aggregators, market, and planning functions within existing cyber security policies to maintain safe, reliable, and low-cost market operations.</p>	<p>To effectively manage grid planning and operations, as well as enhance customer engagement, ESB Networks is actively looking at all new technologies to manage DER's with our existing and future OT systems. Using real-time data, simulations, machine learning, and reasoning to help make decisions and improve performance.</p>
<p>Use of Local Area Energy Planning teams will provide ESB Networks and EirGrid with a valuable source of intelligence on stakeholder and customer thinking and intended behaviours.</p>	<p>Noted.</p>
<p>A pilot project with the right technologies is recommended to establish, implement and verify processes, information exchange, data exchange, awareness, visibility, monitoring and control of generations that are most likely candidates for dispatch down currently so that constraints leading to dispatch down can be managed with minimum curtailment of excess generation.</p>	<p>ESB Networks is considering further pilots in a number of different areas. As part of each of the pilots we will consider how best to get value in terms of the technology including the aspects referenced. In addition, much of our work – including our programme with EirGrid – is focussed on minimising curtailment of generation.</p>
<p>Additional customer engagement programs that can leverage pre-charging, pre-heating, pre-cooling of customer flexibility resources to support reduce dispatch down of renewable generation is recommended as part of optimal resource scheduling. Renewable resources can include the carbon reduction value in the cost-optimization and scheduling to include available flexibility resources to also cost-effectively mitigate dispatch down constraints.</p>	<p>As above, much of our work is focussed on minimising curtailment of generation. We are also further developing our customer programmes to leverage customer flexibility as required across the system.</p>
<p>To reduce despatch down of renewable generation, enhanced control and modelling capabilities are essential, allowing ESB Networks to remotely monitor and control DERs in real-time. Sophisticated modelling tools can simulate various energy scenarios, allowing operators to test and refine dispatch strategies proactively as well as plan both in the short and long term. This predictive approach helps identify and mitigate potential network issues before they manifest, reducing the likelihood of unnecessary dispatch-down events.</p>	<p>Visibility, forecasting, modelling and control of DER's is the focus of one of our workstream tasks in the TSO/DSO programme of work. As noted, this work is vital in ensuring system security and reliability.</p>

Comment	ESB Networks' Response
<p>ESB Networks and EirGrid need to consider use of Operating Envelopes and Dynamic Operating Envelopes to orchestrate the integration and services from a wide range of renewable sources.</p>	<p>Use of dynamic envelopes is part of the long -term vision. As part of the Demand Flexibility Product operation (reference Section 6.2.1 for more detail on this) ESB Networks will be sharing operating envelopes for contracted assets on a daily basis with both EirGrid and the asset.</p> <p>Pilot 2 was set up to introduce dynamic instruction sets. Instruction Sets are limits on distribution participation in transmission markets (SEM and DS3) to protect against unsafe or insecure conditions on the distribution system due to their market activities. Prior to this pilot, instruction sets have been issued annually based on technical studies of the expected worst-case conditions over the course of the upcoming year. This resulted in many sites being prohibited from participating in the market for 6 months of the year (from April to September).</p> <p>Pilot 2 seeks to improve the current process and increase Individual Demand Sites' ability to provide services to the TSO, without creating unsafe or unsecure operating conditions on their local network. The instruction sets are sent daily (Monday to Sunday), and override the standard instruction sets that were usually sent to the DSUs in March/April through the TSO</p>
<p>Consider 'Flexibility First' approach and model. This will deliver faster connections, reduce the immediate demand for network reinforcement and buy time to recognise the impact of new connections, adoption of low carbon technologies and how customer behaviour will/can provide a range of network services. This approach may provide measurable investments deferment with clear metrics and indication when network reinforcement may be required in future years.</p>	<p>As noted, the use of flexibility as an alternative to capital investment has many advantages. ESB Networks will assess each situation on its merits to determine the optimum solution. ESB Networks is also committed to developing the network infrastructure which is vital to the Climate Action Plan.</p> <p>Along with the development of a market for flexible services, ESB Networks' recent 'Expressions of Interest for flexible demand connections is one example of an initiative to use.</p>
<p>A respondent noted that they do not agree with ESB Networks that it is purely energy suppliers that should provide the pathways and incentives to reshape consumer behaviour in these markets. If ESB Networks is to achieve its objectives of supporting all consumers in accessing the benefits of these markets, all routes to market need to be considered, with new, innovative Flexibility Service Providers developing alternative approaches, competing with the legacy energy suppliers to address particular customer needs.</p>	<p>ESB Networks acknowledges the point made and agrees that all energy service suppliers, in the broadest sense, will have a role in facilitating the energy transition. To that end, ESB Networks works collaboratively with all stakeholders across the electricity industry to embed flexibility into Irish society.</p>

Comment	ESB Networks' Response
<p>ESB Networks need to work with both incumbent energy suppliers and new, innovative Flexibility Service Providers in developing future domestic flexibility services, ensuring consumer engagement and trust is at the core of all thinking.</p> <p>Key areas of consideration include: -</p> <p>Customer consent – Capture, Management and Deletion</p> <p>Customer Control – Ensuring the end consumer can always opt out of individual events.</p> <p>Customer Communication – Ensuring propositions and services are understood and not mis-sold.</p> <p>Complaints Management – Development of clear processes to manage complaints, with escalations and redress where appropriate.</p> <p>Metering standards – Ensuring customers are accurately billed / rewarded for their flexibility whilst ensuring asset meters and boundary meters can both be used for both operational and settlement requirements in Flexibility Services.</p> <p>Consistent and simple Baselineing methodologies – Ensuring customers can simply understand what benefits they have delivered in ‘turning up’ or ‘turning down’ their Heat pumps / EVSE’s and Smart Appliances and understand how they have been rewarded.</p>	<p>ESB Networks acknowledges the points made and is committed to working collaboratively with all stakeholders across the electricity industry to embed flexibility into Irish society.</p>
<p>One respondent noted a preference that when it comes to flexible loads such as EVSE or perhaps Heat Pumps/ Air Conditioning systems that using suitably cyber secure APIs for control should remain a valid option, and any mandatory additional requirement for hardware comms interfaces should not be specified.</p>	<p>ESB Networks acknowledges the points made and is committed to working collaboratively with all stakeholders to ensure appropriate standards are agreed as soon as practicable.</p>
<p>A respondent requested details of what information may be required to enable the use of the flexible system demand. This is to enable the respondent to roll out their own technology and gather the relevant information during their roll out.</p>	<p>In terms of an Asset, ESB Networks expects to require MRPN, Eircode and quantity of flexibility being offered in kW and kWh. However, there are likely to be additional information on an Asset that may be required as part of each Flexibility procurement; this information would form part of the requirements of such a tender.</p>
<p>A respondent suggested that ESB Networks consider the interactions between short term markets e.g. day ahead (for operational efficiency) and both long term markets (to support investment) and also Carbon Contracts (to incentivise decarbonisation). It may be that priority needs to be given to supporting investment and decarbonisation rather than operational efficiency</p>	<p>ESB Networks is very much committed to investing in a low carbon future and it is a key consideration into the future planning of our network while also ensuring that we maintain Security of Supply standards that ensure a safe and efficient operation of the network.</p>

Comment	ESB Networks' Response
	<p>The Multi Year Plan introduces measures to support all three objectives:</p> <ol style="list-style-type: none"> 1. The new Flexible Market System, as outlined in section 6.1.3, and Flexible Market Products, described in section 6.2.4, along with other measures, will enhance operational efficiency and provide access to revenues to support investment. 2. Flexible connections, detailed in section 6.2.3, will enable network access and generate revenue from flexibility markets, supporting investment. <p>While the primary goal of these measures is to provide flexibility to address distribution network challenges and facilitate the contribution of customers and assets to system stability, they should also result in reduced carbon emissions.</p>
<p>A respondent asked that ESB Networks clarify explicitly that the term “long duration” refers to the hours of storage at full output whereas “long term” refers to the length of a contract or a time horizon e.g. a long term solution</p>	<p>If this query relates to the Demand Flexibility product then the product is aiming for at least 4 hours of consecutive flexible service provision for a contract duration of 15 years.</p>