National Network, Local Connections Advisory Council Meeting 11

Tuesday 18th November 2025

Agenda

1	Welcome & Housekeeping	10:15-10:25
2	Actions Update	10:25-10:30
3	PR5 Lookback	10:30-10:45
4	Flex Connections	10:45-11:00
5	Local Business Flex & SME Flex	11:00-11:15
	Coffee Break	11:15-11:30
6	Flex Readiness	11:30-11:45
7	Demand Flexibility Product	11:45-12:00
8	Roundtable	12:00-12:30
9	AOB	12:30-12:45
	Lunch	12:45

Speakers

Alan Keegan
ESB Networks DMSO
R&S Hub

Niall Stafford
ESB Networks DMSO
Product Strategy

Fiona O'Donnell
ESB Networks DMSO
Power System Requirements

Victoria Ainsworth
ESB Networks DMSO
Customer

Edmund O'Carroll
ESB Networks DMSO
Business Solutions Support

Kevin Doyle
ESB Networks DMSO
Flexibility Market Development

Welcome

Time Allocated: **10 minutes**

Housekeeping

Please mute your microphone and turn on your camera during the meeting

If joining us virtually, please raise your hand or drop questions into the chat function

Presentations and meeting minutes will be published in the NN,LC stakeholder hub and made available to the general public

Please note over the course of the year there may be open procurement processes so there may be aspects of the programme we will not be in a position to discuss.

Stakeholder forum link : (Our Advisory Council (esbnetworks.ie))

Actions Update

Time Allocated: **5 minutes**

Item	Title	Detail	Status	Progress Update
AC9.1	Behind-the-Meter	• Consider providing a more in-depth update on the NN, LC's Behind-the-Meter activities to AC members.	Open	N/A
AC10.1	Insights and Learnings	• Recommend broader dissemination of insights and learnings from pilot programs.	Open	N/A

Time Allocated: **15 minutes**

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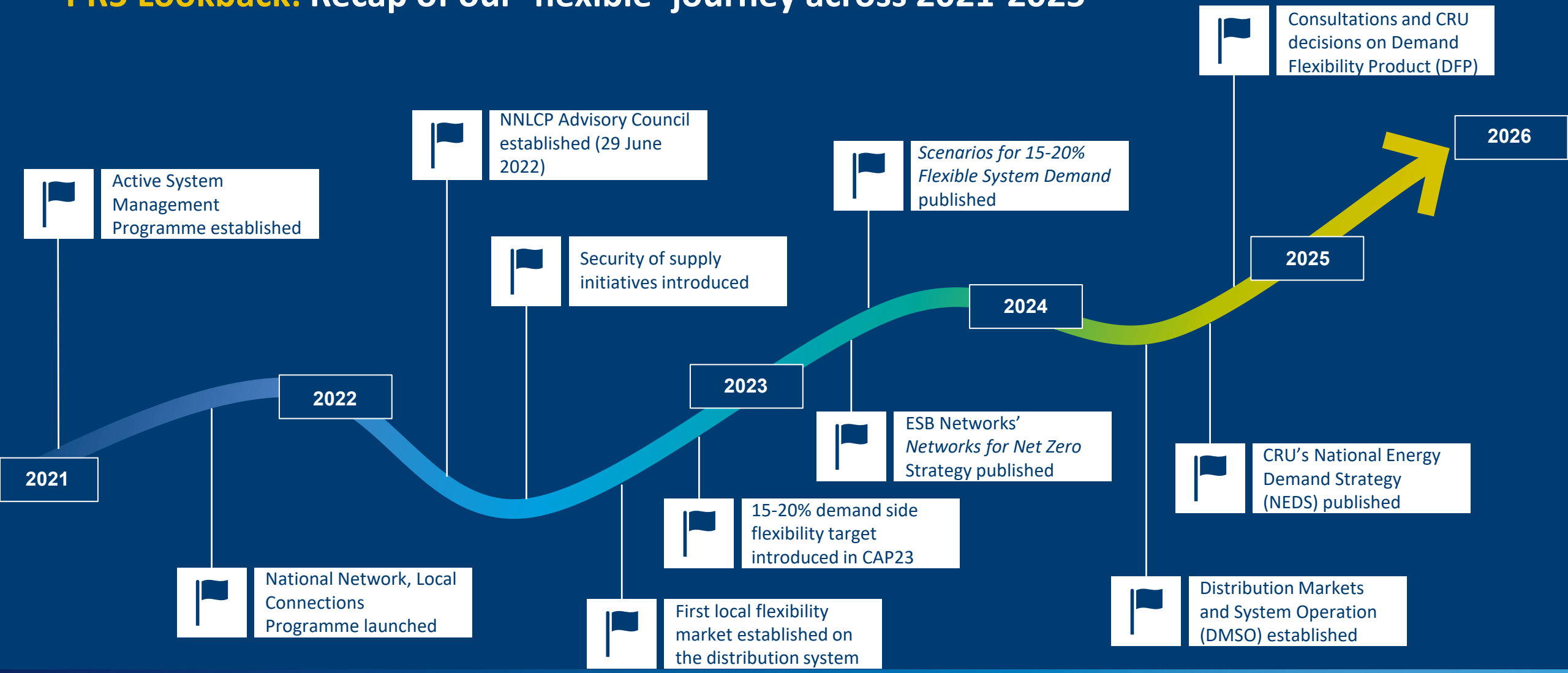
PR5 Lookback

PR5 Lookback: Recap of our ‘flexible’ journey across 2021-2025



PR5 Lookback: Key achievements in standing up a flexibility market in PR5

Established the first local flexibility market on the distribution system, supporting system operation	Identified suitable transformers to run a technical pilot for conservation voltage reduction	Launched flexibility awareness initiatives, including Ireland's Energy Community Toolkit
Introduced dynamic instruction sets to enhance provision of services to the TSO.	Established 'Flexibility Operations', a new, enduring function within ESB Networks	Piloted the technical standards for the control and interoperability of behind-the-meter DERs
Introduced security of supply initiatives (*Is this a good time?* and *Beat the Peak* Business	Created pilot routes to market for nascent, flexible technologies, including electric vehicles	Commenced procurement of a Demand Flexibility Product (inc. consultation and CRU approval)
Progressed with flexible (demand and generation) connections, working closely with the CRU	Progressed with the development of the future DSO-TSO op model, including agreed HLD with EirGrid	Commenced procurement of a Flexibility Management System to systemise the management of flex

Time Allocated: **15 minutes**

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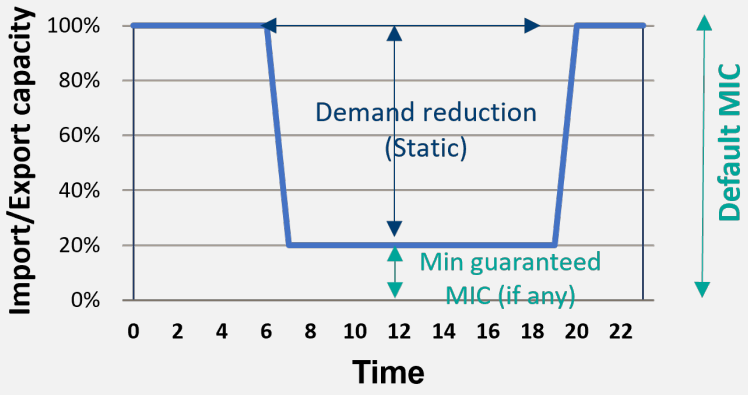
Flex Connections

Flexible Demand Connections Proposition | Definition & Context

Two types of flexible connections are defined as extreme ends of spectrum of flexible connections**. This proposition will focus on Dynamic flexible connection (a non-firm demand connection which does not guarantee full 24/7 access to MIC).**

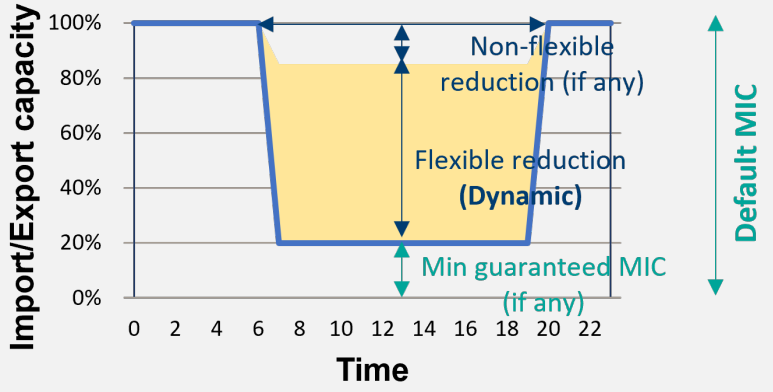
Timed Connections

- Fixed period with lower connection capacity either for a specific time of the day or for a specific portion of the year



Dynamic Flexible Connections

- Benefiting from a real-time dynamic forecast of network headroom based on network load, local generation and network configuration), the customer dynamically adjusts its usage.



Update interval (e.g., 5-min, 60min)

Forecast Horizon (e.g., 24h, 48h)

Operational complexity
Customer curtailment

A flexible connection product provides choice to customers and could create the following benefits

1. Reduced connection costs
2. Reduced line charges
3. Increased speed of connection
4. Option to connect first and decide later on exact physical capacity needs

Flexible Demand Connections Proposition |Key Deliverables & Customer selection

- System Studies which identify the potential for a flexible solution to facilitate a customer connection
- Develop operational processes which facilitate the operation of a customer connection. This will include what equipment needs to be installed to facilitate this
- Legal and Commercial aspects

- Customer is looking for a new connection or increase in MIC
- Customer must be able and willing to reduce their demand – however expectation is that flexibility required would be less that timed connections
- Consider those who submitted response to EoI

Flexible Demand Connections

Focus is on delivering a Minimal Viable Product (MVP) solution to enable a faster delivery and to gather feedback to inform a future enduring solution to handle customers at scale.

Key Principles

1. Customer Selection

- Shortlisting of potential flexible demand connection customer from areas of constraints that are on top of the connection application queue.
- Meetings with Shortlisted Customer to discuss about Flexible Demand Connection.
- Customer decide their suitability for flexible demand connection.

2. Contract & Charges

- Single 'All in One' Connection Agreement & Quotation Letter with clauses for Firm and Flexible Connection.
- Customer is offered an interim Flexible Connection which will transition to Firm Connection following completion of works.
- DUoS billing for Flexible Connection calculated on Total MIC (Firm MIC + Flexible MIC).

3. Proving Test

- Two Stage Proving Test: Stage 1 for Planned Event and Stage 2 for Unplanned Event.
- Maximum of three attempts to pass both stages of the Proving Test.
- Failure to pass Proving Test results in no access to flexible connection and flexible MIC and DUoS billing for next billing period calculated on Firm MIC.

4. Disconnection

- A dynamic forecasted duration of hours in a day and across the lifetime of the temporary connection
- Demand reduction is from Total MIC to Available MIC (Firm) during the period of network constraint.
- Customer de-energisation: If customer non-compliance to instruction results in risk to security of distribution network.
- Customer re-energisation: Once constraint period is over or network issue is resolved.

5. Three Strikes

- Breach of flexible connection agreement: Results in a strike. A breach can be due to customer's failure to acknowledge an instruction and/or failure to act on same.
- Three notices of strike: Results in termination of Flexible Connection and no access to Flexible MIC.
- After three strikes, Total MIC (Firm MIC, removing Flexible MIC) updated in SAP and DUoS billing for next billing period calculated on updated MIC.

Flexible Demand Connections

Detailed end-to-end business processes and systems have been designed and process maps documented to enable the minimum viable product (MVP) of Flexible Demand Connection. The processes are grouped into pre go-live processes and post go-live processes.

Pre Go-live Processes

1. 'New' or 'Increase in MIC' Connection Application
2. Planning studies & selection of potential flexible demand connection customer
3. Meeting with shortlisted customer to discuss about flexible demand connection
4. Technical approval of connection method
5. Approval of Connection Agreement (CRU)
6. Execution of connection agreement and quotation letter
7. Energisation of new equipment
8. Proving test
9. Go-Live with additional capacity

MVP Processes

Post Go-live Processes

9A. Planned demand reduction/ event based on forecast of constraints under normal feeding in customer location

9B. Planned demand reduction/ event based on planned outage in customer location

9C. Urgent unplanned demand reduction/ event based on unplanned outage/ faults in customer location

10. Issuing of demand reduction instruction
11. Real-time monitoring of network & customer profile
12. De-energisation & re-energisation of customer for non-compliance
13. Three strikes operational penalty
14. Transition to firm connection

Flexible Demand Connections

Several systems will be used, and some require changes to enable the minimum viable product (MVP) of Flexible Demand Connection.

Pre Go-live Processes

Process	1. New or Increase in MIC Connection Application	2. Planning Studies & Selection of Potential Flexible Demand Connection Customer	3. Meeting with Shortlisted Customer to discuss about Flexible Demand Connection	4. Technical Approval of Connection Method	5. Execution of Connection Agreement and Quotation Letter	6. Energisation of New Equipment	7. Proving Test	8. Go-Live
								
System	• New Connections Portal	• Technical Approval (TA) SharePoint • PSS Sincal/Excel		• Technical Approval (TA) SharePoint	• SAP • DigiDocs/ By Post	• Smart Ring Main Unit (RMU) • SAP ISU (BAU process of updating MIC)	• APEX FDC • Control Room APEX FDC • Phone Call • NMS • Smart Ring Main Unit (RMU) • SCADA	• APEX FDC • Control Room APEX FDC • Phone Call • NMS • Smart Ring Main Unit (RMU) • SCADA • SLR Report

Post Go-live Processes

Process	9A. Forecasting of Constraints under Normal Feeding in Customer Location Scenario A	9B. Identification of Constraint due to Planned Outage in Customer Location Scenario B	9C. Identification of Unplanned Outage/ Faults in Customer Location Scenario C	10. Issue Demand Reduction Instruction	11. Real-time Monitoring of Network & Customer Profile	12. De-energisation & Re-energisation of Customer for Non-Compliance	13. Three Strikes Operational Penalty	14. Transition to Firm Connection
								
System	• NMS (FLM, Study Mode, Suggested Switching, Optimisation)	• NMS (OMS MV Outages, OMS Switching Plan, Study Mode, Suggested Switching, Optimisation) • VOMS (HV Outages)	• SCADA (BAU Fault Alarms) • NMS(OMS Restoration Guidelines)	• APEX FDC • Control Room APEX FDC • Follow up Phone Call for urgent unplanned demand reduction	• SCADA (BAU Fault Alarm, Trafo, Customer Demand Alarms) • NMS(OMS Switching Plan)	• SCADA • Smart Ring Main Unit (RMU) • OMS Call Entry App	• APEX FDC - Email Notification after each breach • Follow up Phone Call after each breach • SAP ISU (BAU process of updating MIC)	• Update systems: • APEX FDC • Control Room APEX FDC • SCADA • NMS • SAP ISU(optional) • OMS Call Entry App

Flexible Demand Connections

Customer assessment and selection is underway.

Starting point-ESB Networks Planning Load Enquiry Dashboard

- Gathered applications submitted between Jan 2022- May 26th 2025

Applied ruleset developed by PSR for shortlisting process

- New/increase in MIC limit 4MVA
- Current status of the application
- Connecting station loading level
- Whether a single unit connection request or not
- Customer benefit-Flex energization Vs Firm energization-based on planned capex works
- Shallow connections stays same with pre and post capex works

Proposed by planners/area managers

Detailed engagement with planners- Shortlisted application suitability check for detailed Flex Connections Assessments

Region	Number of Applications completed with Detailed Assessment
North-West	1
South-West	7
Sout-Central	3
South-East	1

Time Allocated: **15 minutes**

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SME Flex – Advisory Council

SME Flex Product| Executive Summary

Executive Summary

- SME Flex aims to engage Small and Medium Enterprises (SMEs) in demand side flexibility.
- The initiative aligns with ESB Networks' Flexibility Multi-Year Plan (FMP).
- Key approach: Partnering with 1–3 Industry Partners (IPs) for direct SME engagement.

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.

SME Flex Product| Background & Context

- Previous schemes targeted commercial sector, but SME uptake was limited
- ESB Networks lacks direct channels to SMEs
- SMEs are often time and resource poor, often do not have dedicated energy management roles, procurement process is onerous
- SME Flex differentiates by leveraging industry partnerships for engagement, removing barriers and testing industry partnership models

SME Flex Product| Progress to date

SME Flex Product| Vision & Objectives

Vision Statement

Work with **an Industry Partner** to engage Small and Medium Enterprises (SMEs) in Demand Flexibility over a 12-month period to raise awareness and engagement with demand side flexibility. We aim to gather learnings and insights into how SMEs can participate in demand flexibility. The learnings & insights will be used to inform future products & services for SMEs

Target Behaviour

We want to understand if we can engage the SME sector in demand side flexibility and if we can achieve the following behaviours from SME customers:

1) **Opt-in to participation**
2) **Shift or reduce energy usage in response to event windows (fixed and ad hoc)**
3) **Allow data collection for insights**

Product Objectives

- Test if partnering with an Industry partners provides a better experience/ simplified sign-up process for customers and increases participation
- Test if SME sector likely to provide flexibility
- Understand the optimal conditions for SMEs participating in demand side flexibility
- Gain deeper understanding into motivators, challenges or barriers to participating in demand side flexibility

SME Flex Product| High Level Product Description

ESB Networks will partner with between 1-3 Industry Partners to deliver the Proof of Concept.

Timeline: September '26 – September '27

2 Elements to service window:

1) Monday – Friday (excluding BH) 5-7pm demand down window. No communications will be sent for this delivery period.

2) Ad hoc demand down windows ca. 1 per month (2 hrs in duration) which can occur any time Monday – Friday (excluding BH) and communication will be given for these events in advance. The objective of these is to understand if SMEs can provide flexibility at shorter notice.

Additional features: SMEs will also receive educational content during the scheme, such as case studies and best practice, to enable participation.

Remuneration: In exchange for their participation SME's will be rewarded based on the MWh shifted during these events.

SME Flex Product| Eligibility Criteria

Participating SME

- DG5-7 customers
- Fewer than 250 employees
- Annual turnover ≤ €50 million or balance sheet total ≤ €43 million
- Independent (not owned > 25% by a large enterprise)
- Have QH or smart meters
- Business must have lower than 50,000 kWh consumption per annum
- Cannot be participating in other markets i.e. no stacking possible
- Maximum flexible capacity per customer of 200 kW
- Maximum flexible capacity of 200kW per 38kV station / 1MW per 110kV station

Industry Partner

Ability to:

- Recruit participants through multi channels
- Build a simple sign-up process
- Communicate events with participants
- Access to consumption data for baselining and measuring performance
- Issue remuneration to customers
- Survey customers
- Share customer data and learnings with ESB Networks

SME Flex Product| High Level Responsibilities

ESB Networks Responsibilities

- Devising of the reward scheme methodology
- Communicating ad-hoc event schedules and durations with the IPs
- Devising the baselining methodology
- Conducting audits of baselining and settlement conducted by the industry partner
- Co-creating educational content

Industry Partner Responsibilities

- Operating the participant facing life cycle of the pilot end to end
- Recruiting & Onboarding SMEs
- Conducting baselining
- Communicating ad hoc energy events
- Co-creating and sharing educational content
- Gathering feedback from participating SMEs
- Settlement activities and remunerating SMEs for participation

SME Flex Product| Next Steps

Q1	Q2	Q3	Q4
• Draft EOI • Publish EOI	• IP Selection • T&C's agreed & signed	• Build of relevant processes • Prep for Go Live • Begin Recruitment	• Go Live

Local Business Flex

Local Business Flex (LBF) is a new flexibility opportunity from ESB Networks that will commence in Q1 2026 and is due to run until the end of 2030.

- Its goal is to **reduce pressure on the network** in certain areas of Ireland by encouraging local businesses to use less electricity during certain time periods **(Demand down).**
- It targets **non-residential (business) customers** connected to selected substations that can reduce consumption during selected time periods.
- ESB Networks will launch a **consultation in Q1 2026** to garner views on the product outline.
- Initially the product is focused on one substation in Fermoy and four in Dublin North.

Station Name	Planner Group	County	Voltage level
Coolmine	Dublin North	Dublin	38kV/MV
Glasmore	Dublin North	Dublin	38kV/MV
Mountgorry	Dublin North	Dublin	38kV/MV
Grange (dr)	Dublin North	Dublin	38kV/MV
Fermoy North	Fermoy	Cork	38kV/MV

Note: Locations are subject to change

Time Allocated: **15 minutes**

Coffee Break.. See you in 15 minutes!

Time Allocated: **15 minutes**

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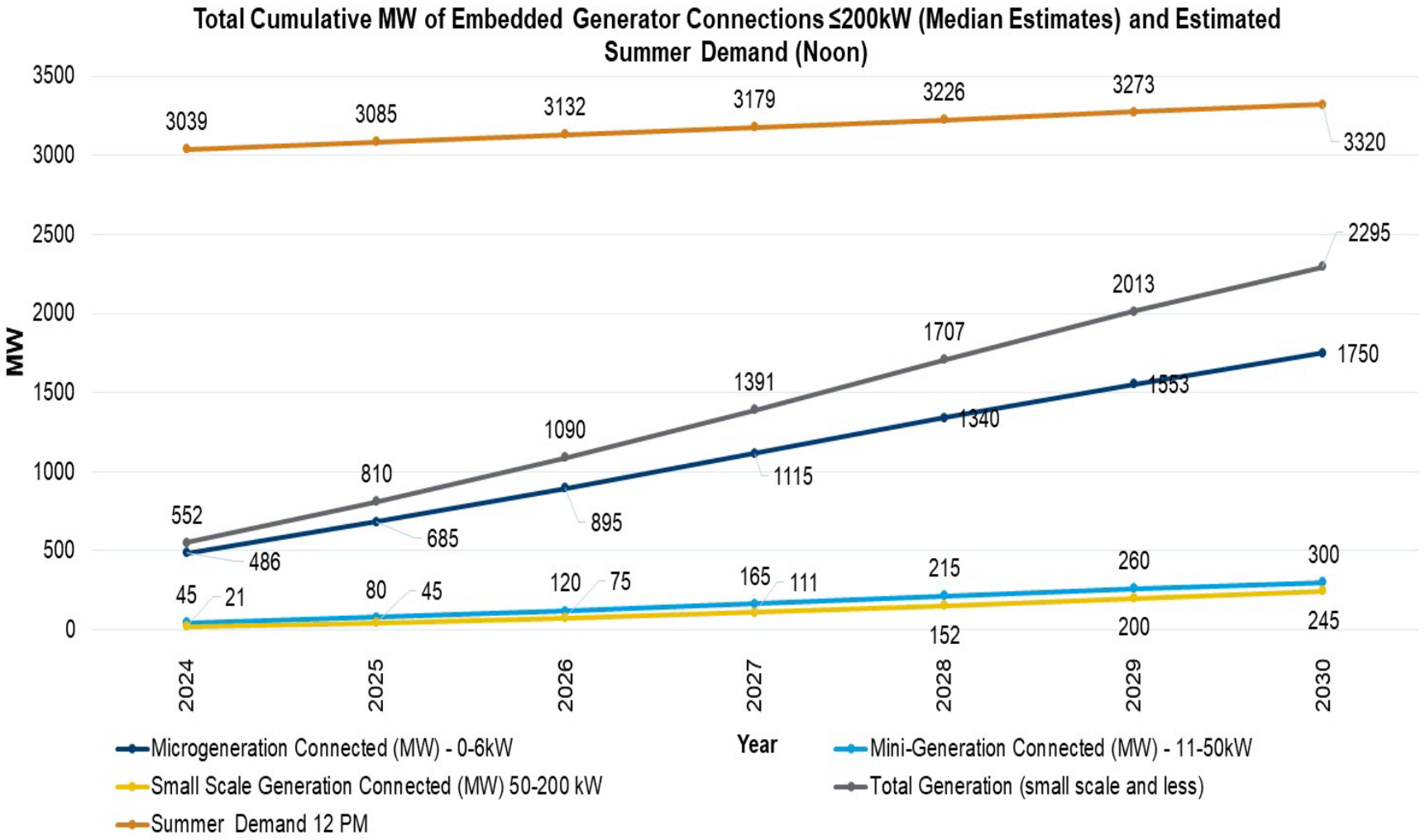
A Network Pilot Demonstration on the Monitoring and Control Capability of Rooftop PV in Ireland

Why Focus on PV in Ireland ?

DMSO
Distribution Markets
& System Operation

- Findings from system operators worldwide show that the growth of unmonitored and uncontrolled distribution connected PV can negatively impact network security and reliability.
- **2030 projections show the expected growth of rooftop PV under 200kW will reach 2.3 GW in Ireland – 1.75GW will be microgeneration (micro generation is <10kW).**



ESB NETWORKS

Australia Flexible Exports for Solar PV – Key Findings

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Distribution Markets & System Operation

SA Power Networks & AusNet - Australia. Real World Implementation
Adopted IEEE 2030.5 standard to allow Flexible Exports

Network Capacity issues necessitated static "worst case" export limits (1.5 kW per phase in SAPN). Implementation of **Flexible Exports via IEEE 2030.5 unlocked significant network capacity.** In South Australia, on average devices received export limits at 10kW or their system capacity for 99.4% of the time. In Victoria, an **additional 154.62MWh of energy was unlocked** for participating trial customers.

SA Government has now mandated flexible export capability for all new solar installations from 1 July 2023. Furthermore, the Victorian government has made Flexible Exports a mandatory capability for Solar Homes rebate eligibility from 1 March 2024. From 1st Oct 2024 all installations of 200kW or less must be emergency backstop compliant via IEEE 2030.5. AEMO recommend leveraging SAPN/AUSNET work on IEEE 2030.5 and CSIP across all jurisdictions.

Learnings for Pilot Development:

Customer Communication:
AusNet learnt it is important to work closely with solar retailers and installers to ensure information to customers is accurate giving the full story of what is available and the benefits.

Consistency in implementation across DSOs:
industry participants advised that consistency between DSOs at a national level is critical to their cost management and ability to provide services at scale

Project Delivery Design:
The team provided clear criteria for success, including delivery of technical build, launch and partnered with industry to build a very clear vision of what success looks like

Installers:
A key challenge was ensuring that installers can correctly install, register, and commission devices in a compliant manner. Clear value in developing and providing simple training and support guides for installers.

Interoperability:
It was found that existing test tools were not sufficient to achieve interoperability. Significant integration testing of all components was required.

Flexible Exports for Solar PV - Final Report (19/10/23)

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PV Inverter Pilot Overview

The pilot has been implemented to establish a minimum viable product to test end to end dispatch. We're using the IEEE 2030.5 protocol to interface with inverter-based rooftop PV, and 1 EV charging point, via OCPP/Modbus in this trial.

Pilot scope

- Gain practical experience and prove all components of the end-to-end process: Registration, communication, monitoring, dispatch and performance testing.
- Identify optimal architecture for the server hosting and for the client setup considering cybersecurity requirements.

Pilot outputs

- 2 months testing
- Testing the integration of the vendor architecture down to a physical inverter in the home – Gateway via Modbus to Inverter.
- Review IEEE 2030.5 performance during the pilot
- Testing curtailing export on the network & voltage control.
- Full pilot report completed by end of November.

Next steps

- Submission of the pilot report & NEDS action to CRU.
- Pilot review and identification of use cases

20 Pilot Locations across Ireland

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DER Type	Model	Location
Solar PV inverter	Solis - Model 56- GR1P3.6 K-M	Dublin (Residential)
Solar PV inverter	Solis S5- EH1P(3- 6)	Dublin (Residential)
Solar PV inverter	Solis Mini S6- GR1P(0.7- 3.6)K-M	Dublin (Residential)
Solar PV inverter	Solis S6- GR1P3K	Dublin (Residential)
Solar PV inverter	Hybrid Solis; S5- EH1P3.6 K-L	Dublin (Residential)
EV Charger	Autel (MaxiCharger AC Wallbox)	Dublin (Residential)
Solar PV inverter	Solis S5- GR3P(3- 20)K	Navan (ESBN Depot)
Solar PV inverter	Solis S5- GR3P(3- 20)K	Naas (ESBN Depot)
Solar PV inverter	Solis S5- EH1P6K-L	West Meath (Residential)
Solar PV inverter	Solis S5- EH1P6K-L	Kildare (Residential)
Solar PV inverter	Solis Type S6- GR1P4K	Wexford (Residential)
Solar PV inverter	Hybrid Solis; S5-EH1P6K	Clare (Residential)
Solar PV inverter	Solis S6- GR1P3.6 K-M	Cork (Residential)
Solar PV inverter	Solis S5- GR1P6K	Cork (Residential)
Solar PV inverter	Huawei Sun2000-4.6KTL	Limerick (Commercial)
Solar PV inverter	Huawei Sun2000-4.6KTL	Limerick (Commercial)
Solar PV inverter	Huawei Sun2000-4.6KTL	Limerick (Commercial)
Solar PV inverter	Huawei Sun2000-4.6KTL	Limerick (Commercial)
Solar PV inverter	Huawei Sun2000-4.6KTL	Limerick (Commercial)
Solar PV inverter	Huawei Sun2000-4.6KTL	Limerick (Commercial)

Lab Engineering

- Test and configuration of gateway devices in controlled lab environment
- Installation and Configuration of IEE2030.5 Cloud based server
- Edge Device configuration and associated MODBUS mapping for Inverters and EV Charger
- End-to-end Integration
- End-to-end lab testing and verification

Field Engineering

- Installation of pre-configured edge gateways on various sites at pre-defined locations
- On-site engineering works and test/verification

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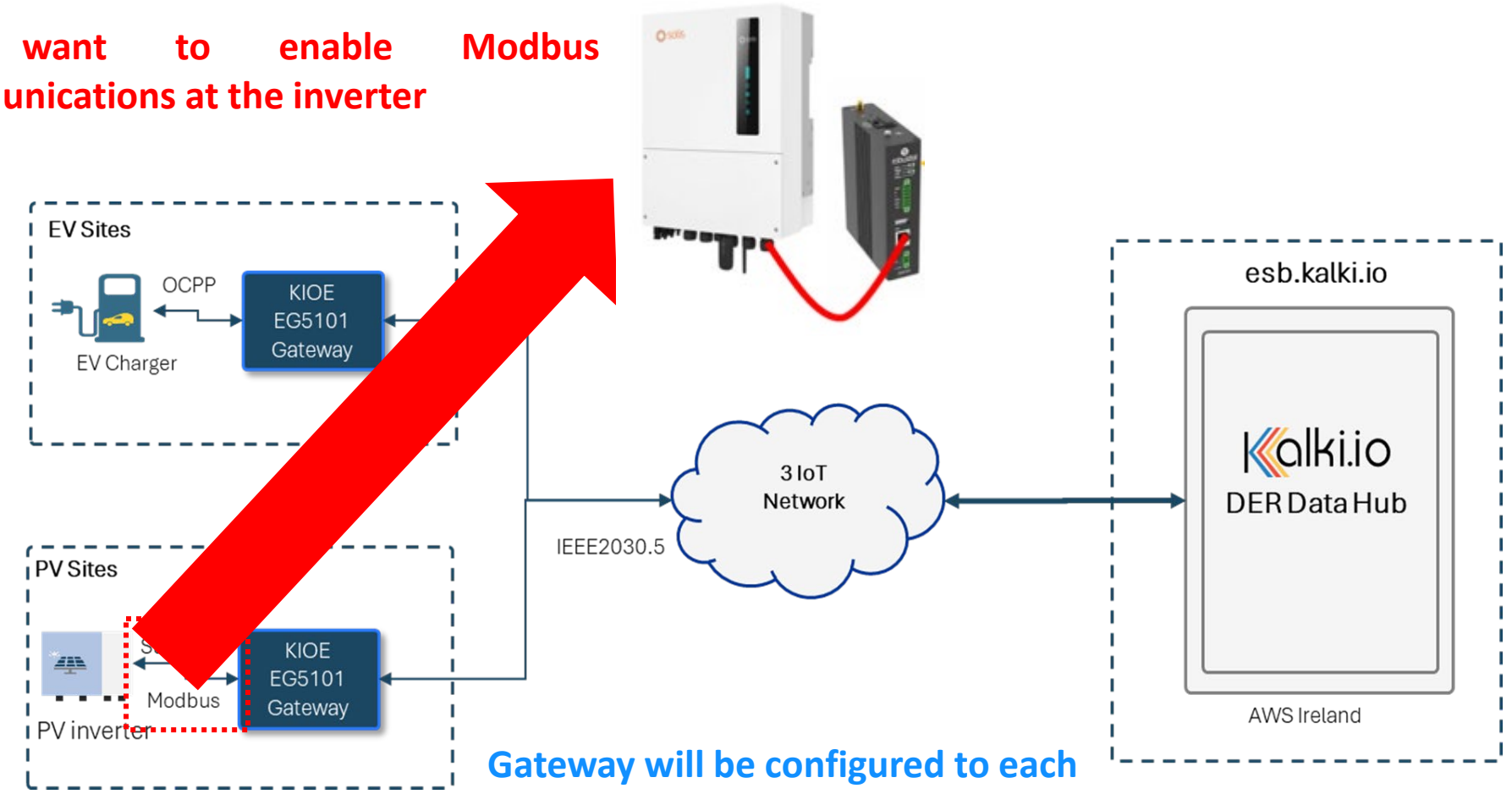
Enable Modbus Communication at the Inverter

We want to enable Modbus communications at the inverter



Gateway will be configured to each model of inverter

Field Engineering - Home Installs in 30 mins!!

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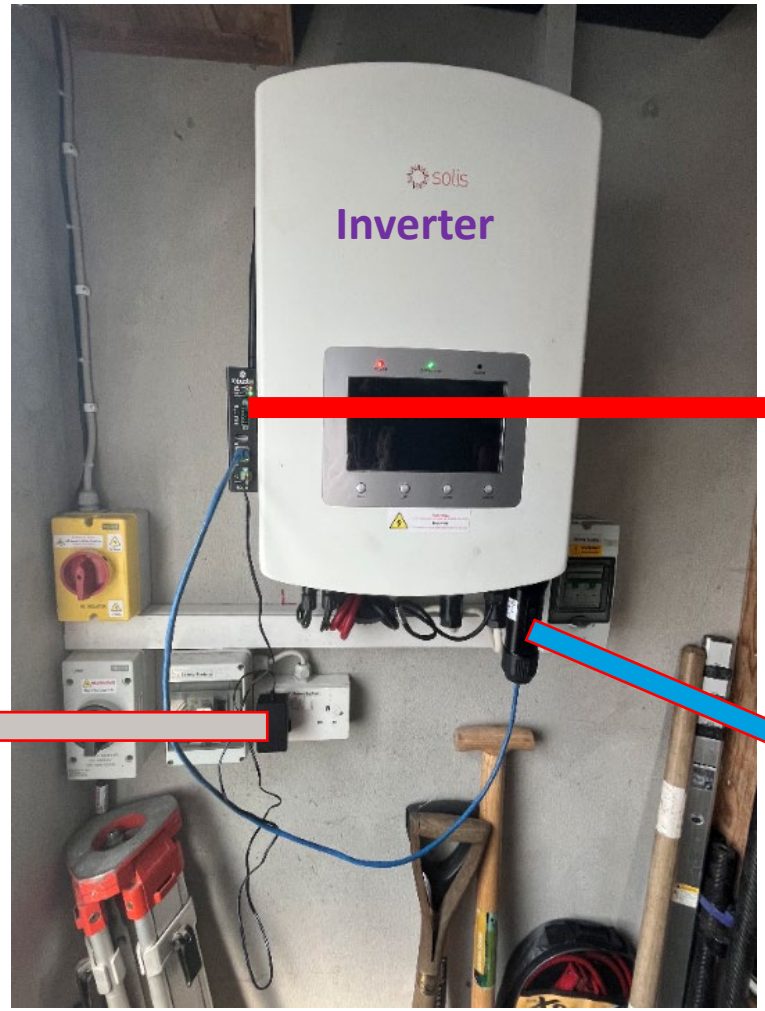

Communication Gateway

Gateway
Power
Supply

Dongle allows for dual comms to Solis
App and ESB Gateway

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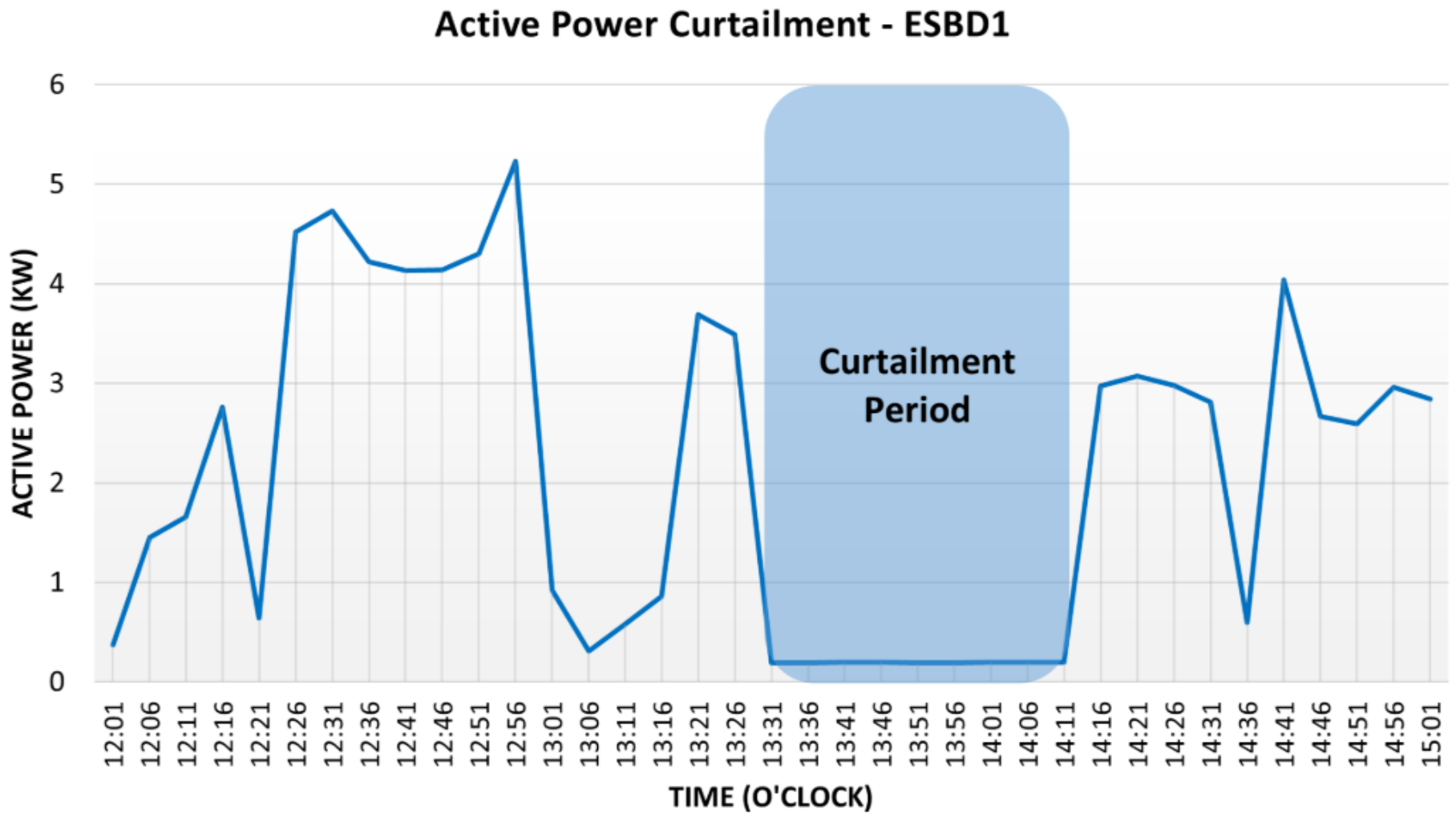
Individual Curtailment Result



Pilot Outcomes

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& System Operation

- Real world experience in designing and implementing technology behind the meter
- IEEE 2030.5 dispatch capability to monitor and control solar PV inverters – a 1st in Europe
- IEEE 2030.5 has proven to be robust and communications availability have been excellent
- Modbus via the gateway highly dependable and easy to install in the home
- Dynamic flexible export control has now been demonstrated on individual & in aggregate sites in Ireland
- Dynamic voltage control – with remote Volt/Var curves implemented on inverter sites. This capability improves hosting capacity and manages network voltage

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Next Steps

Update ESB Networks Company Standards to include inverter communication requirements for small scale generation

Regulator submission Q4 2025 to focus on future architecture requirements following pilot learnings and international best practice

Review use cases and work with all key stakeholders

Time Allocated: **15 minutes**

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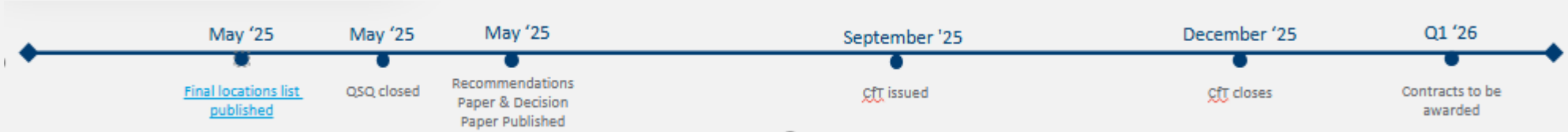
Demand Flex Product

Pilot Outcomes

DMSO
Distribution Markets & System Operation

Progress this summer:

- The first round of procurement for the Demand flexibility product, the QSQ, closed in May of this year
- Responses to the QSQ were assessed by ESB Networks and applicants will now be aware of the status of their application. Successful applicants are invited to partake in the CfT stage
- A Call for Tender document and draft contract was produced by ESB Networks and issued on eTenders last month (15th Sept)
- The CfT stage of procurement will close in December this year.
- ESB Networks will then evaluate all responses and successful applicants will be awarded contracts in Q1 2026.



ESB NETWORKS

Roundtable Discussion

Time Allocated: **20 minutes**

Open discussion and questions?

Time Allocated: **15 minutes**

AOB

1. TSO/DSO operating model industry webinar (Wednesday 3 December 2025) – more details and registration invites to follow.

2. Advisory Council 2026 - end of year survey to issue.

Thank you!

Contact us at engagement@esbnetworks.ie