

NATIONAL NETWORK LOCAL CONNECTIONS

BEHIND-THE-METER INFRASTRUCTURE STRATEGY

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NETWORKS

Call for Input | Behind-the-Meter Infrastructure | July 2024

OVERARCHING · VISION · NORTH STAR

Our Vision

Ireland's climate action and net zero targets are met

Our Mission

Our mission is to drive climate action by building the DSO's capability to cultivate customer participation and flexible, whole-of-energy-system solutions

Our Enabler

'Flexible system demand' is demand with the ability to respond to changing states of generation, demand, storage, and network conditions through a combination of system operator mechanisms, such as implicit and explicit flexibility, coupled with individual/collective customer behaviour.

How will we enable our purpose, vision and mission?

Power System Requirements

An understanding and foresight of the impacts, characteristics and evolving needs, of a highly distributed, low-carbon electricity system. The technical expertise to develop innovative solutions - including identifying opportunities for customers to provide flexible services - to support growing customer demand and increasingly distributed generation including storage

Flexibility Market Design

Local and national markets for flexible demand, run by the DSO as a neutral market facilitator, offering a mix of long-term, day-ahead and intraday arrangements that afford all customers with opportunities to participate

Retail Market Design

Setting the future direction for the smart meter-enabled retail market, with suppliers equipped and incentivised to harness available data to create dynamic, personalised tariffs for their customers. We will work closely with suppliers and the CRU to optimise retail market design, enabling synergies and efficiencies in operating flexibility and retail markets

Customer

We want to encourage all energy consumers to become active energy citizens by promoting thoughtful electricity usage. By understanding demand side flexibility, personal energy patterns, and the origins and impacts of energy use, customers can take control to positively influence the grid, environment, and their finances

Smart Metering

Setting the future direction for smart meters, including use cases - such as harnessing smart meter data to (i) identify faults, and (ii) baseline, measure and validate flexibility services delivered by customers - the implementation of the next generation meter, and the development of an enduring solution for microgeneration

Behind-the-Meter Infrastructure

Behind-the-meter infrastructure, including clear technology requirements and standards for data exchange and communication protocols, to ensure customers' homes, vehicles, solar panels and batteries are flexibility ready



Core Foundations

Regulatory: Mandates, authority, policy, alignment, codes, licences

Legislative and Policy: Climate Action Plan

Stakeholder: Voice of the stakeholder and citizen

BEHIND · THE · METER · INFRASTRUCTURE · OVERVIEW

OBJECTIVE

Behind-the-meter infrastructure must proactively enable customers to participate in flexible demand, by becoming responsive to evolving price and network condition signals. Clear and achievable behind-the-meter infrastructure requirements are needed to harness the inherent flexibility of behind-the-meter distributed energy resources (DERs) including solar PV, home battery storage, smart EV chargers and energy management systems for domestic appliances.

To optimise the ability of behind-the-meter DERs to participate in flexible demand an agreed infrastructure – including clear data exchange and communication protocols between customers / DERs, market participants and system operators – must be in place. As set out in detail in ESB Networks' *Signals & Data Exchange Guidance for DER*, several DER integration and control approaches have emerged from recent and ongoing utility demonstration projects moving towards the introduction of standard requirements for DER controllability and interoperability, including the introduction of inverter requirements around active and reactive power response capability.

We believe the introduction of industry-wide standards and protocols is critical from early 2024 onwards to

- Enable consumer participation in flexible demand by introducing standard technological requirements
- Reduce potential barriers to entry by making requirements consistent, standard and universal
- protect against customers being locked out of flexible demand products due to non-flexible technologies
- Protect against avoidable network congestion as a result of high uptake of non-smart technologies.

STRATEGIC PROPOSALS

- 1 INVERTER-INTERFACED PV / BATTERIES**
Enabling quick and efficient PV uptake, and domestic customers' participation in flexibility products using their micro- and mini-generation
- 2 SMART EV CHARGING**
Enabling domestic and commercial customers participatee flexibility products and services, and avail of flexible connections.
- 3 SMART DOMESTIC ENERGY MANAGEMENT**
Facilitating customers' ability to directly contract with suppliers and aggregators to participate in new flexible demand products and services.
- 4 TECHNOLOGICAL INTEGRATION**
Design of the operational technology dispatch architecture integration with operations systems.
- 5 FLEXIBILITY-READY CHARGERS**
Technical specifications, communications protocols and standards needed to deliver flexibility-ready EV chargers and charge points
- 6 FLEXIBILITY-READY HOUSING**
Delivering flexibility-ready social housing initially, with full Part L adoption to follow, ensuring economically vulnerable customers have access to all flexibility offerings.

STRATEGIC PARAMETERS



ARENAS

Where will we be active?

- In-home gateway and behind-the-meter infrastructure design addressing EV charging, PV and battery inverters, and interfacing with home energy management systems
- Data exchange and communication protocols between these DERs, market participants and system operators
- DER integration and control approaches
- Smart inverter requirements around active and reactive power response



VEHICLES

How will we get there?

- Development of behind-the-meter infrastructure technical architecture and standards governing the connection of behind-the-meter DER systems (chargers, inverters, etc) with the Irish distribution system for adoption / approval by the CRU
- Engagement with stakeholders on proposals to support timely and efficient supply chain adoption of these standards
- Behind-the-meter proofs of concept and pilots as required to support the development, validation / testing and adoption of standards.



DIFFERENTIATORS

How will we stimulate the marketplace?

- Transparency and engagement with industry in the development and finalisation of the behind-the-meter technical architecture and standards
- Use of standard technological requirements, based on international and domestic developments and trials to date

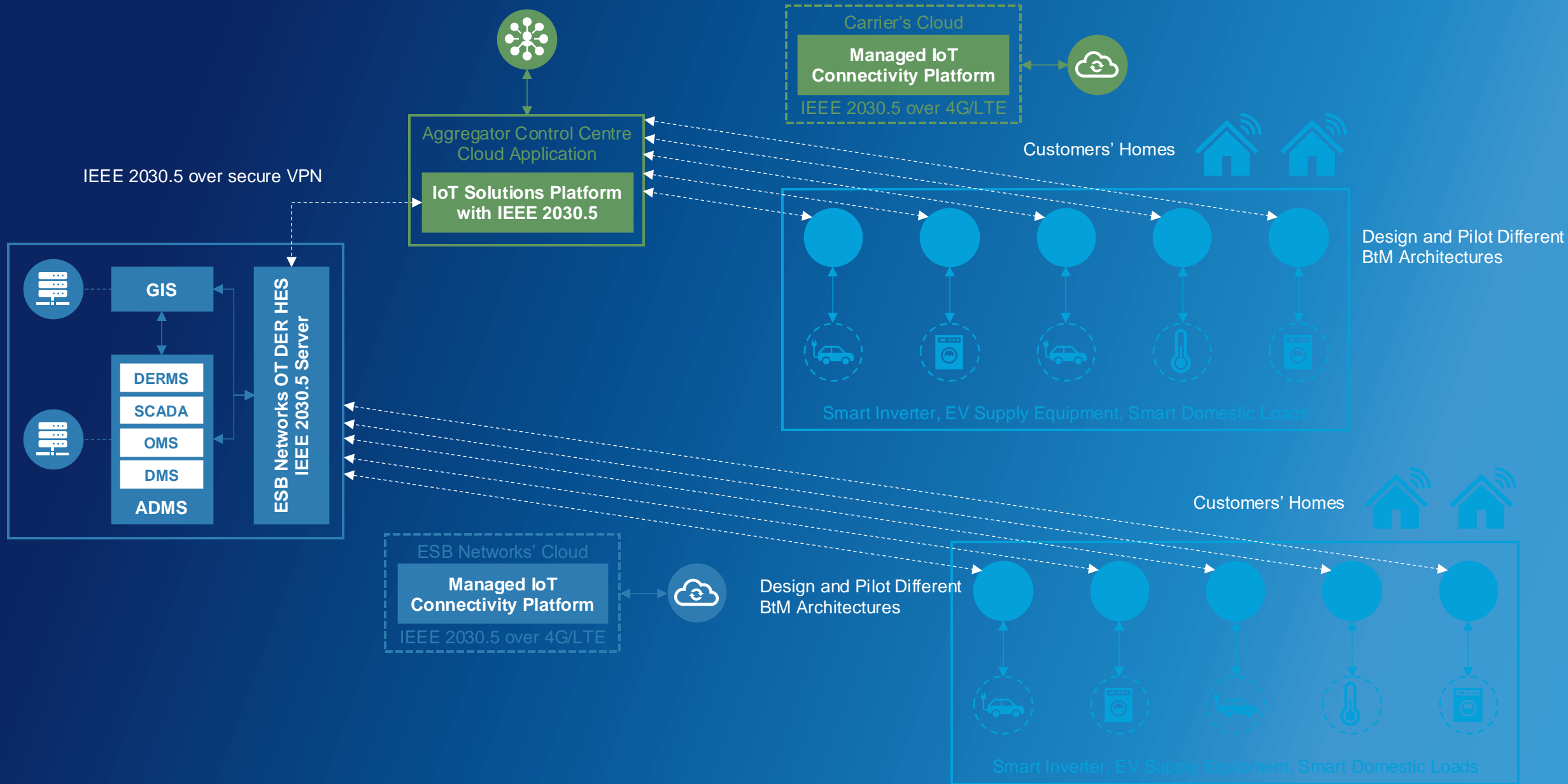


ECONOMIC LOGIC

How will this provide consumer value?

- Exploring the most cost-effective in-home gateway and behind-the-meter infrastructure solution that mitigates potential delays in installing and commissioning
- Driving cost reduction by signalling & adoption of consistent standard requirements

BEHIND · THE · METER · INFRASTRUCTURE · VISION



STAGING · PLAN TO 2030



Work in progress in 2024 and expected to be completed in 2025

In late Q4 2023 the BtM team consulted on the architecture direction with a wide range of external industry stakeholders. The team revised the 2024 workplan to incorporate the invaluable feedback from this consultation

- **Capabilities being progressed to facilitate future behind the meter operability**
 - Setting standards for interoperability across the architectural systems and industry actors
 - Aligning the approach to international utility best practice for behind the meter and DER activation
 - Enabling the safe network integration for BtM technologies including cybersecurity requirements
 - Engagement with industry on architecture to facilitate innovation and enable customer participation
 - Design of pilots to verify compliance with architecture options and standards.
- **Defining Standards**
 - Propose interoperability standards in line with international practice
 - Set out defined requirements and use cases for DSO operations for BtM assets.
 - Engage with regulatory & department stakeholders on developing required policy and/or legislative updates required to support the BtM interoperability standards
 - Progress developing and embedding the standards at an industry level.
- **Technical Architecture**
 - Review of international best practice on the options for enabling BtM interoperability standards
 - Engage with solution providers on technology options and conduct lab-based testing of BtM architecture
 - Engagement with industry stakeholders on the options for BtM architecture and on pilots to demonstrate the end-to-end BtM architecture to customers.
 - Engage industry to set direction on future technical architecture.