



**NETWORKS**

# NATIONAL NETWORK LOCAL CONNECTIONS PROGRAMME

**Power System Requirements Strategy**

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# 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. It is characterised by direct system operator actions, coupled with individual/collective customer behaviour*

How will we enable our purpose, vision and mission?

## Power System Requirements

A deep 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 to support growing customer demand and increasingly distributed generation, and 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

Creating the conditions for customers to participate in immersive, personalised experiences of flexible demand. Helping to drive education and the national conversation, about how we can all take control of our energy demand, and share in the benefits. Migrating products and services to third parties when appropriate to do so

## 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

# POWER · SYSTEM · REQUIREMENTS · OVERVIEW

## OBJECTIVE

The Electricity Market Directive (EU) 2019/944 defines the role of the DSO in relation to the introduction of flexibility services, including:

- The development of flexible products and services necessary for **the efficient, reliable and secure operation of the distribution system**. [EU2019/944, Article 31].

Power system analysis gives us a **deep understanding of the distribution system, its location-specific characteristics and its constraints**. This, in turn, will facilitate the identification of the right opportunities to deploy alternative, cost-effective flexible solutions, as a complement to long-term system development (capital reinforcement), so that **Climate Action Plan targets are proactively supported** in how we develop and **operate the distribution system in a safe and secure manner**.

As the distribution system, customer needs and the solutions available evolve, the DSO is putting in place new and **enhanced capabilities to assess and model its future needs**, ensuring system security, resilience and, in parallel, delivering on Climate Action Plan targets.

## STRATEGIC PROPOSALS

- 1 FORECAST GENERATION AND LOAD**  
Forecast localised distributed generation, low-carbon technologies and demand to support system operation and planning
- 2 ENHANCE SUITE OF STUDIES**  
Analyse the needs/impacts of generation and demand, assessing thermal, voltage, system strength, harmonics and other parameters
- 3 HIGHLIGHT SYSTEM REQUIREMENTS**  
Identify and publish (on a 2-yearly basis) the requirements – and the potential – for flexible services in the short, medium, and long term
- 4 ENHANCE CONNECTION PLANNING**  
Introduce – and embed – flexible connections, to accelerate electrification and the connection of renewable generation
- 5 ENHANCE INVESTMENT PLANNING**  
Develop an enhanced investment planning methodology to identify optimum solutions to identified network constraints, taking account of different attributes of various solutions and where and when flexible services are available
- 6 ENHANCE OPERATIONAL PLANNING**  
Enable the DSO's optimisation of demand and supply, at a local level, by undertaking near real-time and real-time operational planning

## STRATEGIC PARAMETERS



### ARENAS

*Where will we be active?*

- Forecasting **generation and load growth** – (including profiles)
- Modelling short- (real-time and near real-time) and **long-term system requirements**
- Identifying **network constraints** resulting from customer needs and the evolving electricity system
- Identifying how alternative, cost-effective **flexible solutions** can be deployed
- Facilitating **flexible connections** for demand and generation customers



### VEHICLES

*How will we get there?*

- **Innovation and streamlining** in power system analysis
- Industrialise process for the execution of system studies
- Development of a methodology for **capex deferral investment taking account of new services and solutions**
- **Near real-time and real-time operational planning desks**



### DIFFERENTIATORS

*How will we stimulate the marketplace?*

- **Transparency**, including the publication of updated market information related to short- and long-term flexible services needs
- **Stakeholder engagement**, to ensure alignment of new developed products and services with real customer needs and capabilities



### ECONOMIC LOGIC

*How will this provide consumer value?*

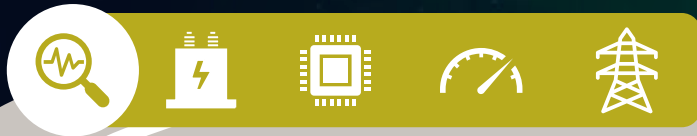
- Identifying and deploying the **most economically advantageous solution**, be it network reinforcement or flexibility services
- Fostering **competition between network and non-network solutions**

# POWER · SYSTEM · REQUIREMENTS · VISION

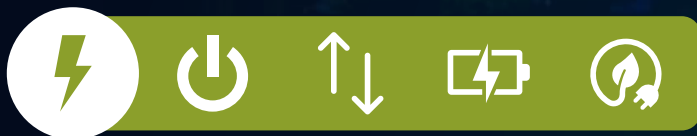
**Forecast Generation and Demand:** Forecast localised distributed generation, low-carbon technologies and demand to support system operation and planning



**Advanced System Studies and Analysis:** Identify new flexibility services opportunities, based on analysis of the capabilities, needs and impacts of generation and demand, assessing thermal, voltage, system strength, harmonics and other parameters



**Flexibility Needs Statements:** Identify and publish the scale, type and locations of flexible services to address short-, medium- and long-term system needs



**Connection Planning:** Utilise enhanced tools and analyses to introduce and embed flexible connections, to accelerate the connection of renewable generation and low-carbon demand



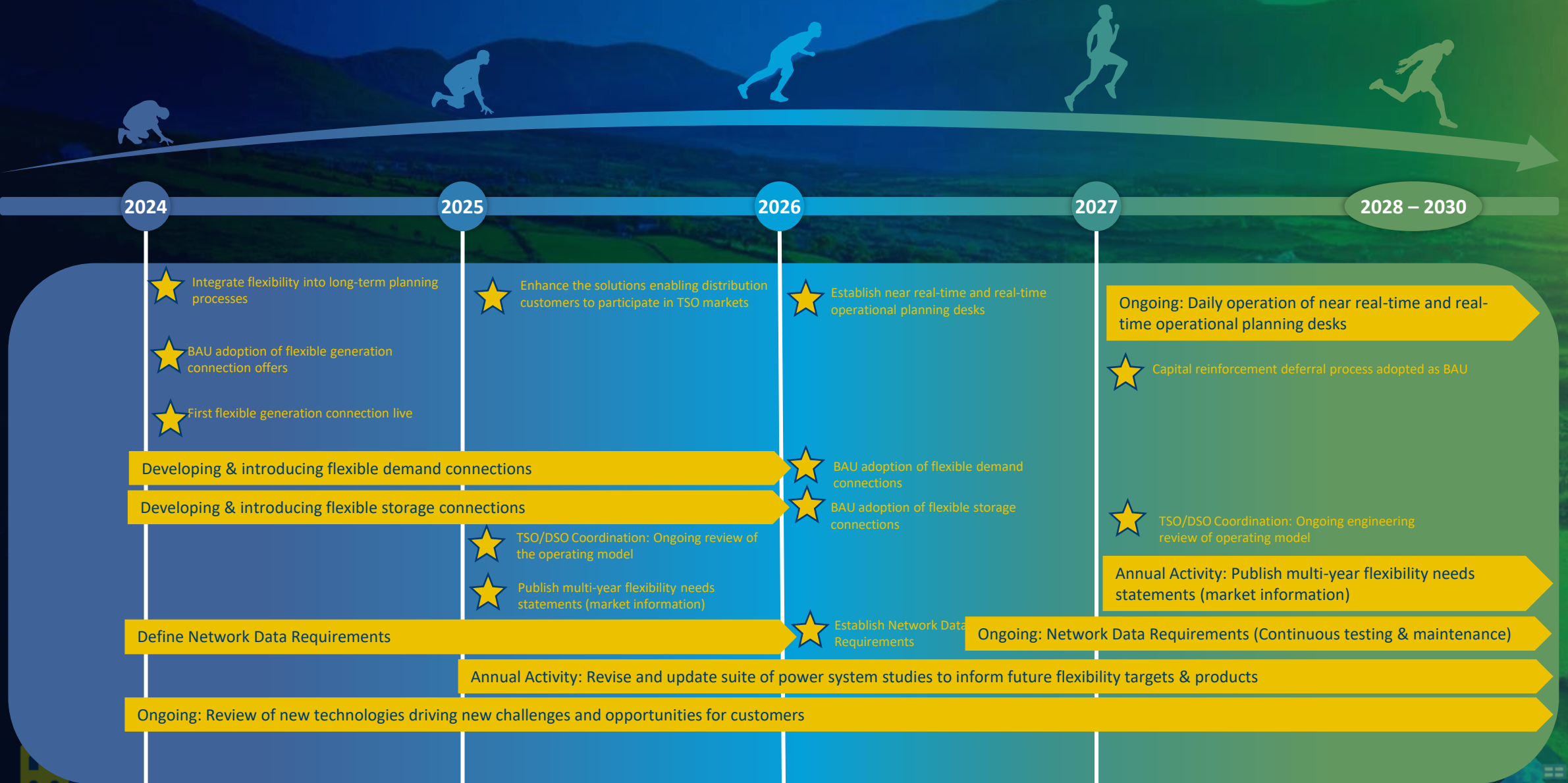
**Investment Planning:** Develop an enhanced investment planning methodology to identify optimum solutions to identified network constraints, taking account of different attributes of various solutions and where and when flexible services are available



**Operational Planning:** Enable DSO optimisation and local balancing of flexible demand, storage and distributed generation, applying near real-time and real-time operational planning



# STAGING - PLAN TO 2030



2024

- ★ Integrate flexibility into long-term planning processes
- ★ BAU adoption of flexible generation connection offers
- ★ First flexible generation connection live

Developing & introducing flexible demand connections

Developing & introducing flexible storage connections

Define Network Data Requirements

Ongoing: Review of new technologies driving new challenges and opportunities for customers

2025

- ★ Enhance the solutions enabling distribution customers to participate in TSO markets

- ★ TSO/DSO Coordination: Ongoing review of the operating model

- ★ Publish multi-year flexibility needs statements (market information)

Annual Activity: Revise and update suite of power system studies to inform future flexibility targets & products

2026

- ★ Establish near real-time and real-time operational planning desks

- ★ BAU adoption of flexible demand connections

- ★ BAU adoption of flexible storage connections

- ★ Establish Network Data Requirements

2027

- ★ Capital reinforcement deferral process adopted as BAU

- ★ TSO/DSO Coordination: Ongoing engineering review of operating model

Annual Activity: Publish multi-year flexibility needs statements (market information)

Ongoing: Network Data Requirements (Continuous testing & maintenance)

2028 – 2030

Ongoing: Daily operation of near real-time and real-time operational planning desks