SP Electricity North West

DSO Functions Webinar

Distribution System Operations

21/08/2025

Agenda

SP Electricity North West

Distribution Future Electricity Scenarios

- Andrea Ballanti, Smart Grid Engineer
- Christos Kaloudas, Capacity Strategy Manager

Data in Action

- Barry Burke, DSO data manager

Flexibility Services

- Paul George, DSO Commercial Lead

Operational Decision Making

- Georgia Anagnostou, Flexible Solutions Engineer

SP Electricity North West

Distribution System Operations

Distribution Future Electricity Scenarios

21/08/2025

Andrea Ballanti, Smart Grid Engineer, DSO
Christos Kaloudas, Capacity Strategy Manager, DSO

What is DFES?

The Distribution Future Electricity Scenarios (DFES) are our long term forecasts of electricity demand, distributed generation (DG), battery storage and low carbon technologies deployment across the North West.

Our last published DFES includes six scenarios. The Best View scenario follows the same rationale with last year's publication (standardised ENA definition) and defines the highest certainty trends for a 10 years horizon followed by central assumptions in the longer term.

In 2024 we modelled for the first time the four new scenarios that align with the newly introduced framework of the Electricity System Operator's (NESO's predecessor) Future Energy Scenarios (FES). These are Holistic Transition, Electric Engagement, Hydrogen Evolution and Counterfactual. This alignment supports whole system thinking, ensuring a cohesive approach for our stakeholders.

All six scenarios are produced following our enhanced ATLAS methodology, which is fit for system planning purposes bottom-up, time-series, machine learning enabled and granular forecasting methodology. For the first time we publish forecasts for over 30 thousand substations across our low voltage (LV) network in our new bespoke DFES LV workbook.

DFES Processes

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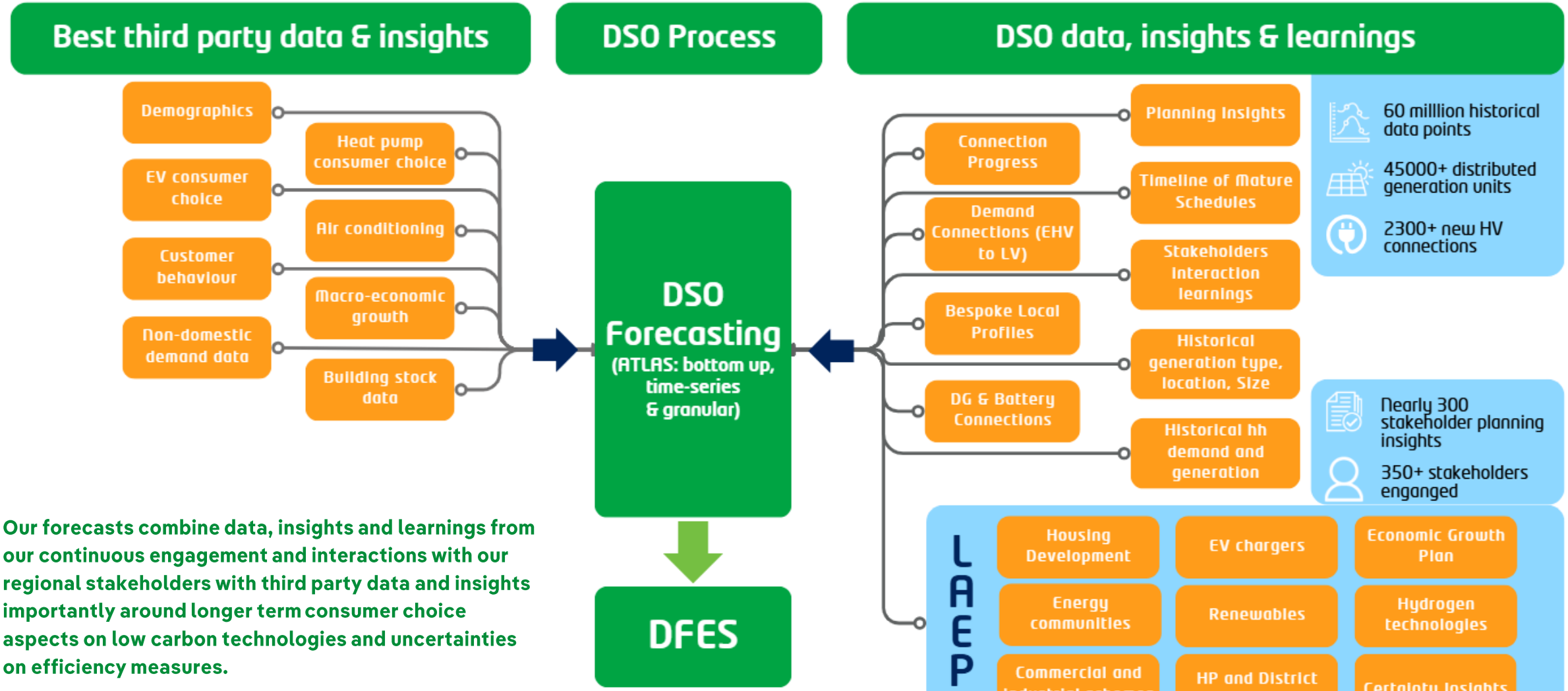

Our forecasts combine data, insights and learnings from our continuous engagement and interactions with our regional stakeholders with third party data and insights importantly around longer term consumer choice aspects on low carbon technologies and uncertainties on efficiency measures.

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DFES Results

What will the future look like?

A Day in 2040 in the North West

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Nearly one in every two dwellings is expected to have a heat pump.

One out of every 16 homes will feature rooftop photovoltaic panels.

Nearly 9 out of 10 individuals currently behind the wheel are anticipated to be driving electric vehicles

A Day in our Region in 2040

	Today	2040
Annual Electricity	21 TWh	44 TWh
Number of EVs	170k+	3 millions
Number of HPs	25k+	1.2 millions
DG Capacity	1.6 GW	2.9 GW
Battery Storage	400 MW	2800 MW

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DFES Long Term Trends and Results

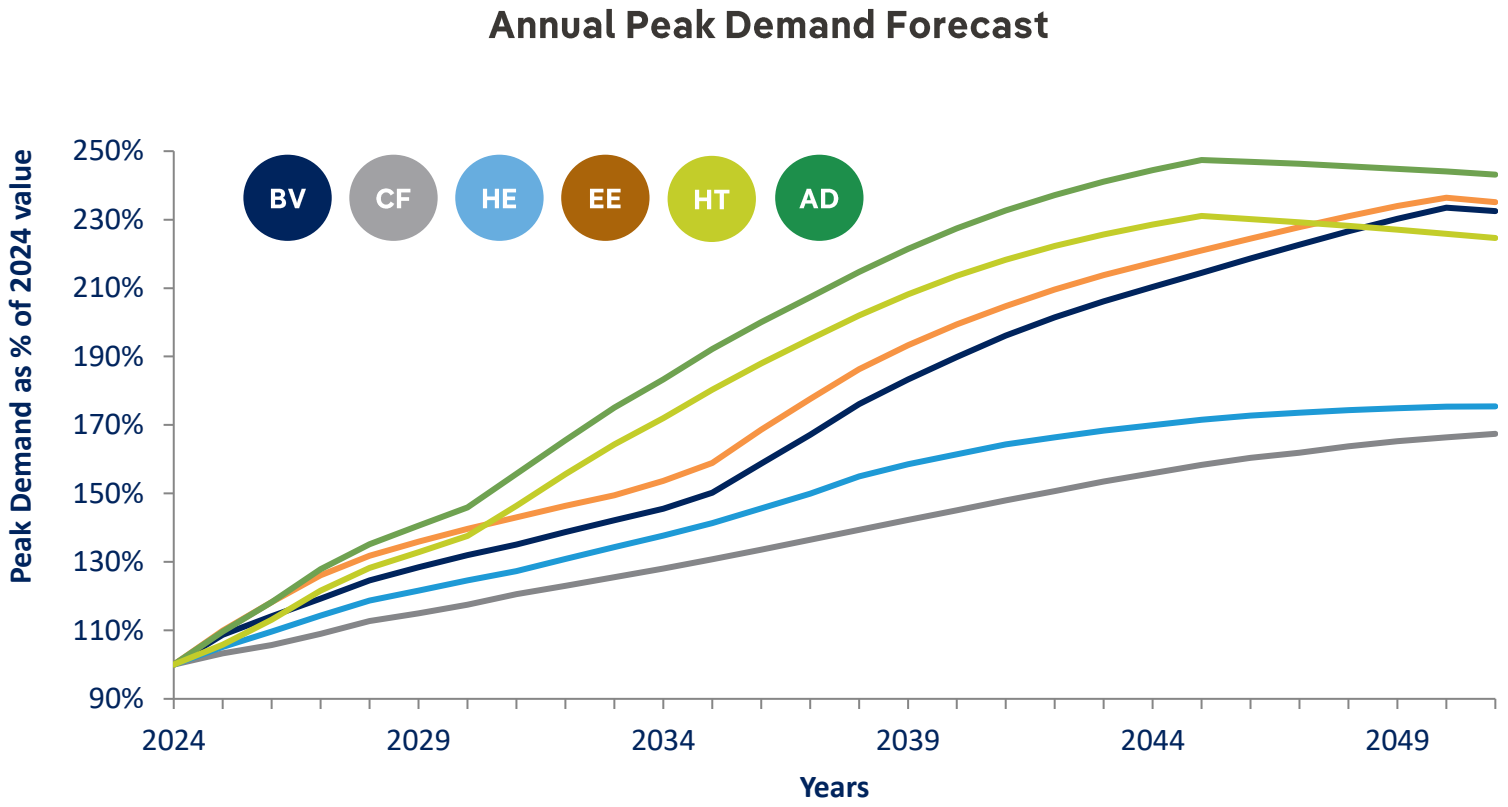
DFES Results

Peak Electric Demand

Our highest certainty trend in Best View is that peak electricity demand will be predominantly driven by 2030 by local planned developments and the electrification of transport. Beyond 2030 there is higher certainty in the range of peak demand growth defined by the scenarios considering higher levels of electrification of transport and heating (Best View, Electric Engagement, Holistic Transition and Accelerated Decarbonisation).

In 2024 DFES we observed a slight increase in the peak electricity demand in our region. We also recorded an over 200% rise in connection acceptances compared to ED1 as the Access and Forward-Looking Charges Significant Code Review (Access SCR) arrangements resulting in lower connection fees for our customers have unblocked their plans and incentivised more customers to connect.

Looking ahead, the expected growth in electric vehicle (EV) adoption and heat pumps will be the main driver in the peak demand in our region.



Higher certainty for Best View

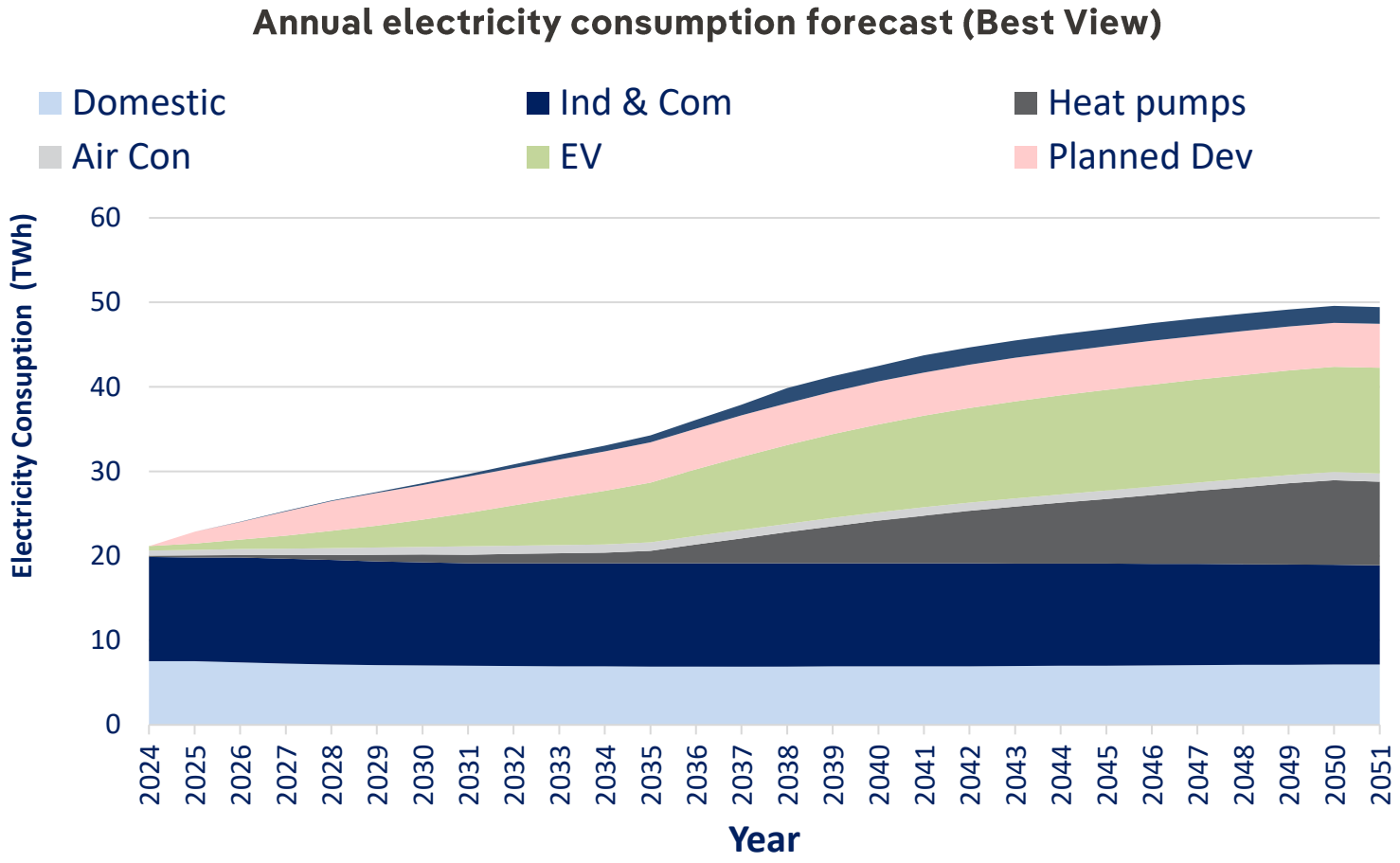
Higher certainty for high electrification scenarios (BV, EE, HT and AD)

Electricity Energy Consumption

In the Best View scenario, EVs and planned developments are expected to be the primary contributors to the increase in energy consumption in the short term. However, starting in the mid-2030s, we anticipate a surge in heat pump adoption, making it the second largest low-carbon technology in terms of demand consumption, following EVs.

The annual electricity (energy) consumption is expected to increase at faster pace than peak demand. The main factor behind this is that EV charging is a more flexible activity as customers are expected to be successfully incentivised to charge their vehicles at times of lower electricity demand.

On the contrary, heat pumps even with the use of hot water storage are a more inelastic activity as customers require heating at specific time windows during the day and there are limitations in how much heating can be generated at times of low electricity demand and stored for use at other times.

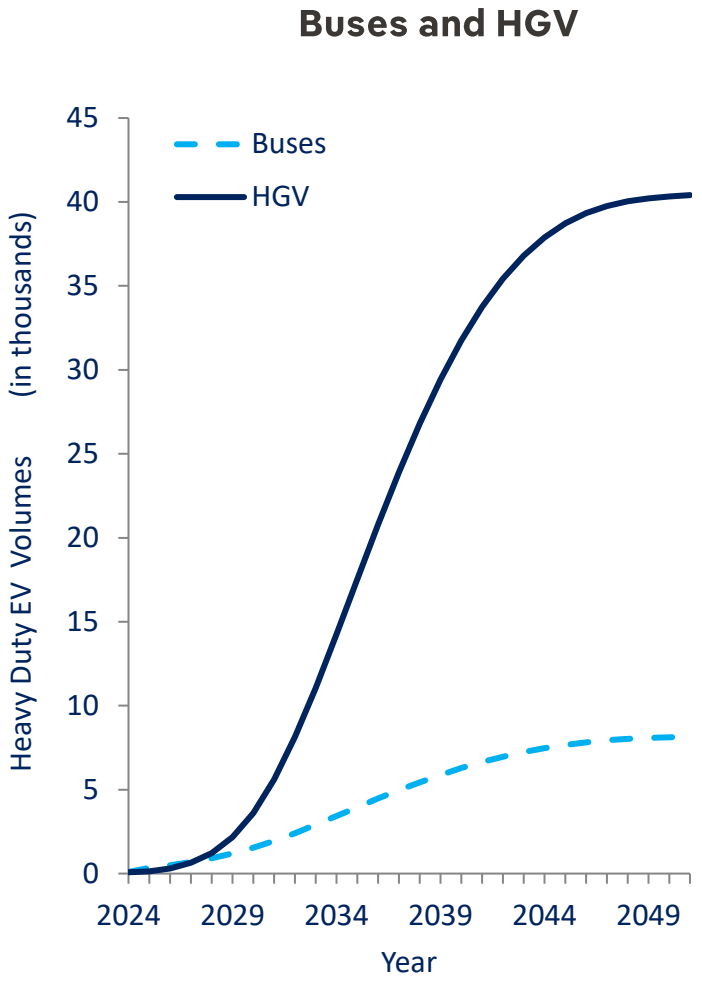


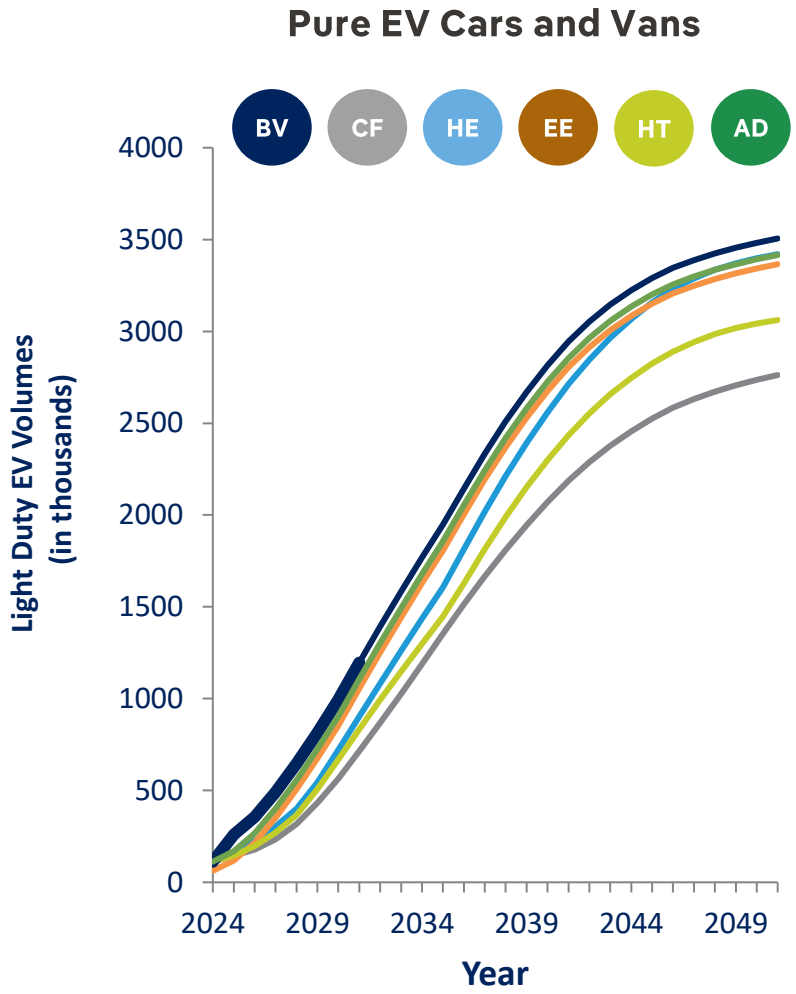
Electrification of Transport

Our projections for electric vehicles consider a range of both local and regional/national factors, including battery prices, perceived accessibility to charging stations, zero-emission vehicle (ZEV) mandates, short-term and long-term sales trends, and battery electric vehicle (BEV) supply as well as customer behaviour.

In our 2024 DFES, we saw a higher uptake of electric heavy goods vehicles (EV HGVs) compared to last year's DFES thanks to a model update. According to recent findings rigid HGVs, especially those ranging from 7.5t to 26t, are already proving to be cost-effective to convert to battery electric for some of the most prevalent applications.

Additionally, more than half of rigid HGVs can be electrified now without heavily relying on a public charging network, thanks to their ability to charge overnight. In addition, very recently the first 42t fully electric HGVs have started their operating in the UK.





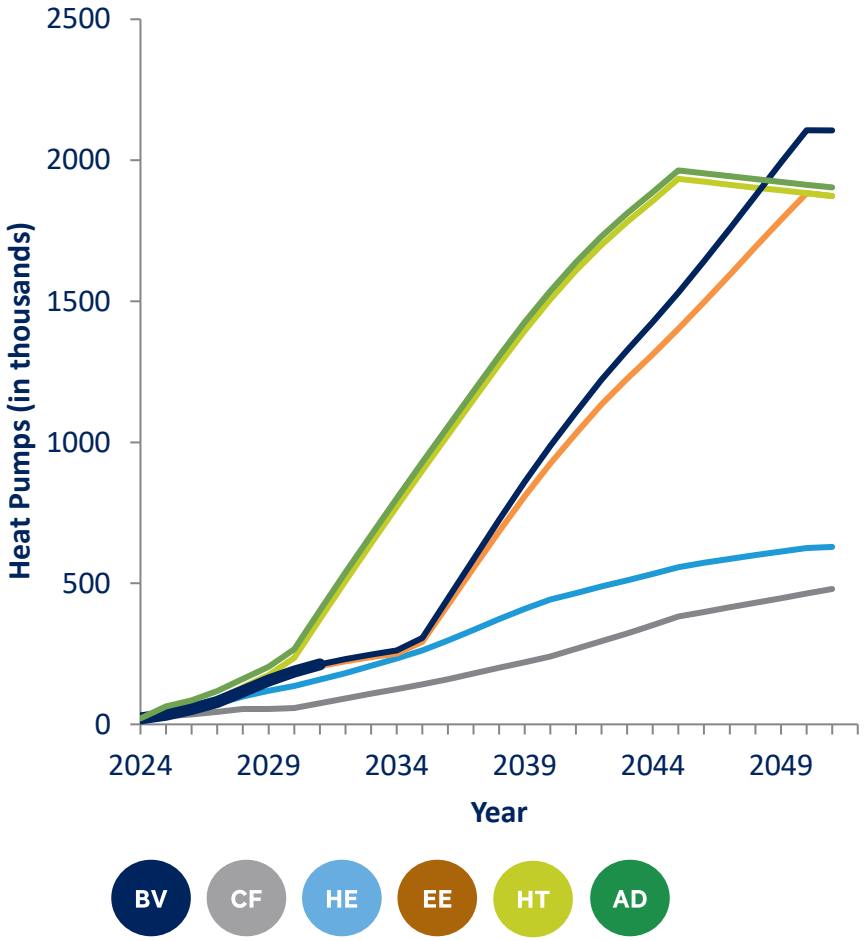
Electrification of Heating

By 2040 we anticipate in Best View that approximately 45% of domestic customers will have heat pumps. While electrifying heating is a low-regret solution, to maximise whole system benefits it is essential to proceed with enhancements in building fabric to increase energy efficiencies.

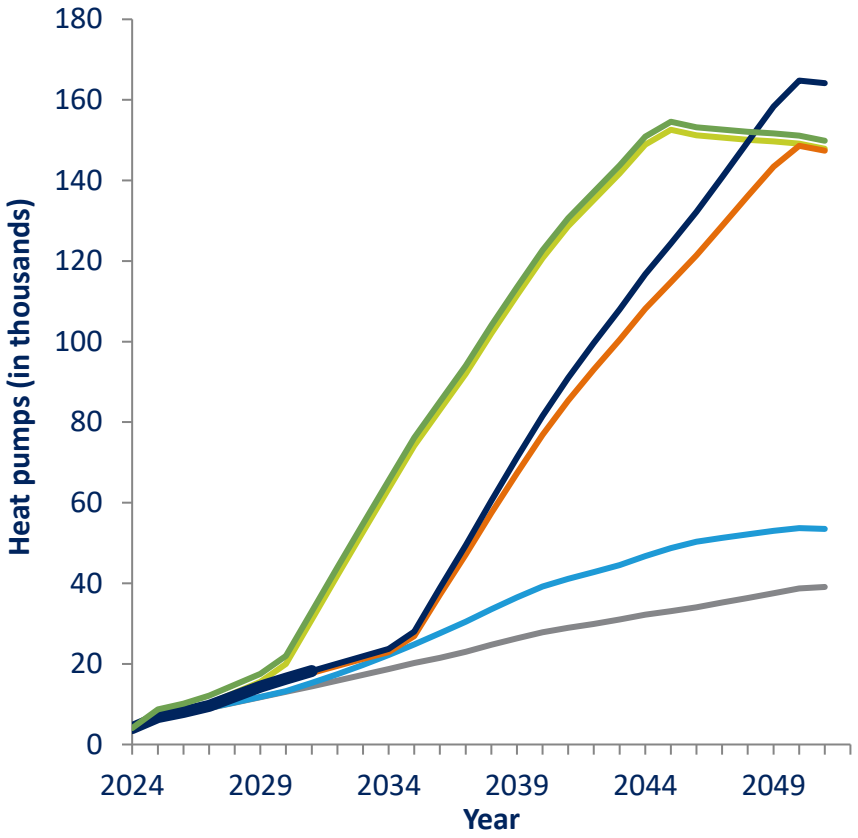
In our Best View scenario and Electric Engagement scenarios, we expect volumes to align closely with last year's projections. However, in the Accelerated Decarbonisation and Holistic Transition scenarios, the rate of adoption is faster.

This is based on the assumption that existing buildings will not have the option to choose their heating fuel by 2030, unlike the 2035 timeline set in the other scenarios.

Future Volume of Domestic Heat Pumps



Future Volumes of Industrial and Commercial Heat Pumps



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Data

Our Forecasting Data

Data in our DFES

Each year, we publish our main DFES Workbook with 30+ datasets detailing electricity demand, generation and low-carbon technology forecasts with different granularities down to granular local authority and primary substation feeding areas.

In 2024 DFES we also presented our first DFES LV workbook with forecasts across over 30 thousand substations.

New

Our first DFES LV workbook with forecasts across over 30 thousand substations.

Our DFES data is accessible through our OpenData Portal in different formats

API | Maps | Custom Views | Tabular | Graphs

What is coming: DFES and tRESP

In April 2025 Ofgem published its final decision on the role of Regional Energy Strategic Plans (RESP) developed by National Energy System Operator (NESO), who are acting as whole system planning coordinators. The RESP has been set up to develop regional plans, including our region, across all energy vectors.

SP Electricity North West is actively engaging with NESO through working groups and bilaterals, supporting and shaping their thinking on the first transitional RESP (tRESP) and providing extensive data.

NESO is expected to provide pathways (LCT uptakes), consistent planning assumptions (technology profiles) and strategic investment needs for the North West as part of the tRESP.

In forthcoming 2025 DFES SP Electricity North West will produce DFES:

- following our state of the art and continuously evolving ATLAS methodology that has a primary planning purpose (meeting license obligations for security of supply and economic network development)
- embedding in a range of scenarios the tRESP input, which will inform & be facilitated our RIIO-ED3 (2028-2033 regulatory period) business plans

Data in action

21/08/2025

Barry Burke, DSO data manager

Live demo

SP Electricity North West

Flexibility Services

21/08/2025

Paul George, DSO Commercial Lead

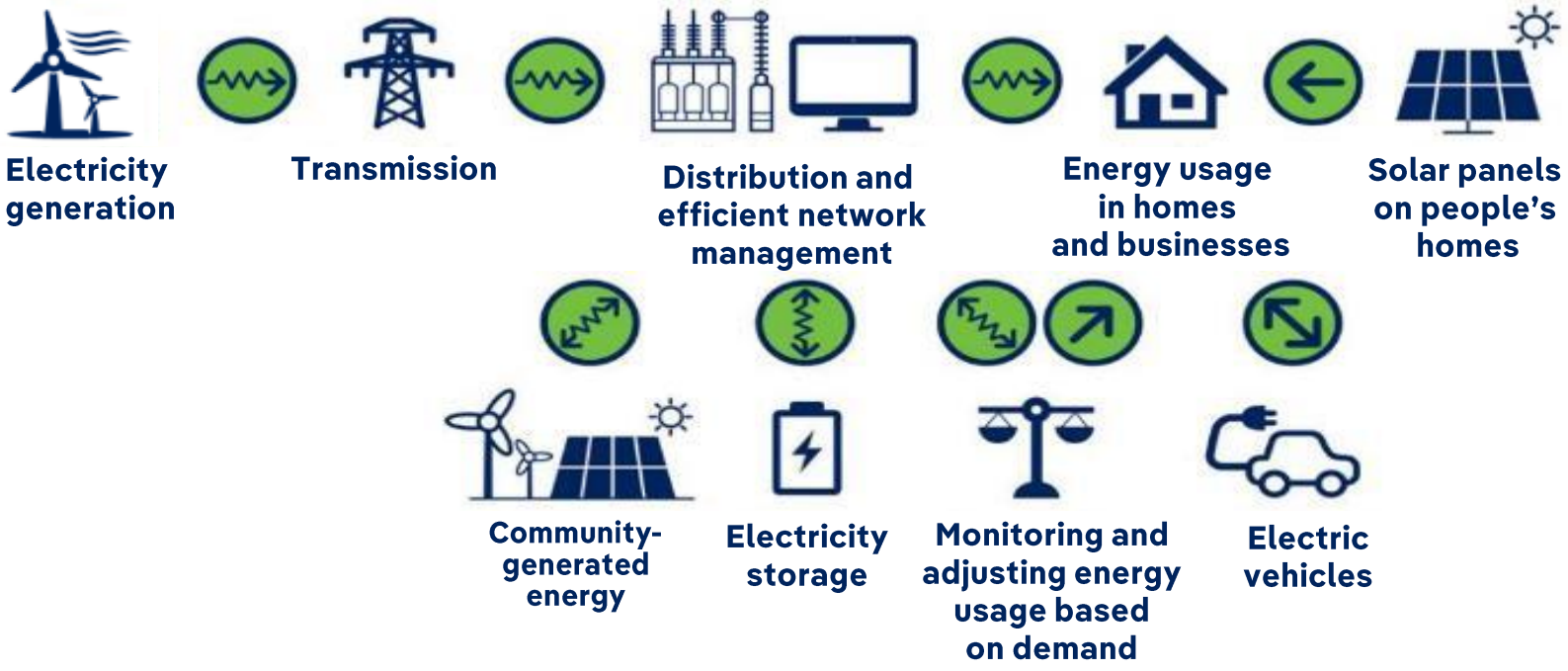
Content

Introduction to DSO

SP Electricity North West

How we previously managed the network

How the electricity network might look in the future



Social DSO Strategy

Social DSO Goals

Mission - Enabling the North West to achieve a 'just' energy transition

Support our network	Reduce network capacity bottlenecks in the North West and prioritising flexibility
Deliver social benefits	Make investment decisions that maximise social benefits in the North West, supporting the environment, economy, and community resilience
Collaborate & co-create	Work collaboratively to increase system efficiency, using smart technology and partnerships to maximise clean renewable energy when it is available
Inclusive Flexibility Services	Promote broader sharing of Flexibility Services benefits by supporting clean energy investments, sustainability, and climate projects in marginalised communities

Social DSO- Community Flexibility Fund

SP Electricity North West

Why we're doing this

- Make it easier for communities to participate in flexibility markets
- Deliver social and environmental benefits
- Accelerate local efforts to decarbonise and build resilience
- Supporting community owned flexibility assets
- Build trust and transparency on how we run our network

Who can apply?

- Be a legally constituted community energy organisation
- Operate within our network area
- Deliver clear local benefits e.g tackling fuel poverty or improving energy resiliency
- Have secured match funding offered, creating joint investment in outcomes
- Propose an asset that helps address local network needs
- Be willing to sign a flexibility contract once the asset is installed

What support is on offer?

- Matched funding up to £50,000
- Expert advice on asset feasibility and location
- Guidance and support from our Community Liaison team
- Access to a community flexibility toolkit
- Help with contracts and reporting requirements

Types of Flexibility Services

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Demand Reduction	EV charge point load management	Turning off or shifting intensive processes	Controlling heating systems	
Generation	Renewable generation	Battery storage	Standby generation	
Energy Efficiency	Solar panels	LED lighting	Insulation	Modernise equipment

- Minimum threshold is 10 kW derived from an individual asset or an aggregation of assets
- Flexibility can be delivered from energised or planned assets
- Technology agnostic

DSO Flexibility Products

	Product description
Dispatchable	**Variable Availability & Operational Utilisation-** Procured ahead of time but the availability parameters are refined closer to the event; the amount of flexibility delivered is agreed nearer to real time, based upon actual network measurement data
	Operational Utilisation- Provides a service where the amount of flexibility delivered is agreed nearer to real time, based upon actual network measurement data
Scheduled	**Scheduled Utilisation-** Flexibility providers alter their supply up or down in accordance with a pre-defined schedule
	Peak Reduction- Provides a reduction in peak power utilised over time

Autumn 2025 Tender

- Tender launch towards the end of October
- Concludes in March
- Will represent our largest Low Voltage requirements to date
- Requirements covering 2026-28

Timelines

27th October- Tender opens → **12th December** Commercial qualification closes → **6th January** Technical qualification closes → **26th January- 9th February** bidding window → **9th March** onwards – contracts awarded

Process

Register on ElectronConnect → Upload Assets → Commercial Qualification → Sign framework agreement → Confirm participating assets → Place bid on Electron Connect

www.enwl.co.uk/future-energy/flexibility-hub/

Operational Decision Making

21/08/2025

Georgia Anagnostou, Flexible Solutions Engineer

What is Operational Decision Making?

The ODMF report sets out SP Electricity North West's approach to decision-making surrounding **how**, **when** and **where** we use network **automation** systems, **flexibility** measures or other **intervention** (such as reinforcement), as well as **human** decision-making to manage **constraints** on our network.

Overview

SP Electricity North West

What is the Purpose of the ODMF?

Addressing stakeholders' need for a consolidated understanding of our process for making operational decisions on the network.

Why is ODMF important?

- Ensures transparency, clarity and fairness in our decision making.
- Explains how we make efficient decisions that ensure a safe and secure network.
- Gives customers and stakeholders confidence that we are using the most appropriate interventions to manage constraints.
- Gives flexibility market participants confidence that we are a neutral market facilitator.
- Enables all parties to make informed choices on network activities.
- Addresses conflict-of-interest concerns

Who is the Audience?

- All network users
- Stakeholders and Authorities
- Flexibility market participants

ODMF Principles

SP Electricity North West

Safety

Prioritising the safety of everyone interacting with and impacted by our network

Transparency

Upholding transparency in our operational decision-making processes

Security and reliability

Continuously enhancing the reliability of the electricity supply

ODMF Principles

Sustainability

Delivering sustainable solutions taking into account our carbon footprint

Efficiency

Operating with optimal efficiency to deliver value for money to customers

Social Value

Ensuring the energy transition is inclusive, supporting local economies and resilience

Flexibility in Operational Decision Making

SP Electricity North West

Our "Flexibility First" commitment

Types of Flexibility

Flexibility Services

These are demand response services where customers connected to our distribution network agree to actively make **temporary** changes in the way they **consume, generate, or store electricity** to help us manage a **constraint** on the network during peak times or restore an **outage/fault**, in return for payment.

Flexible Connections

A flexible connection is a **contractual** arrangement, as part of the customer's connection agreement, that allows us to **reduce (curtail) the import or export capacity** of the customer to help us resolve network **constraints**.

Flexible Assets

These are SP ENW-owned and -operated assets which can be **controlled** e.g. tap changers, capacitors, circuit breakers, switches. By **changing the network topology**, we can alter power flows alleviating constraints.

When we use Flexibility

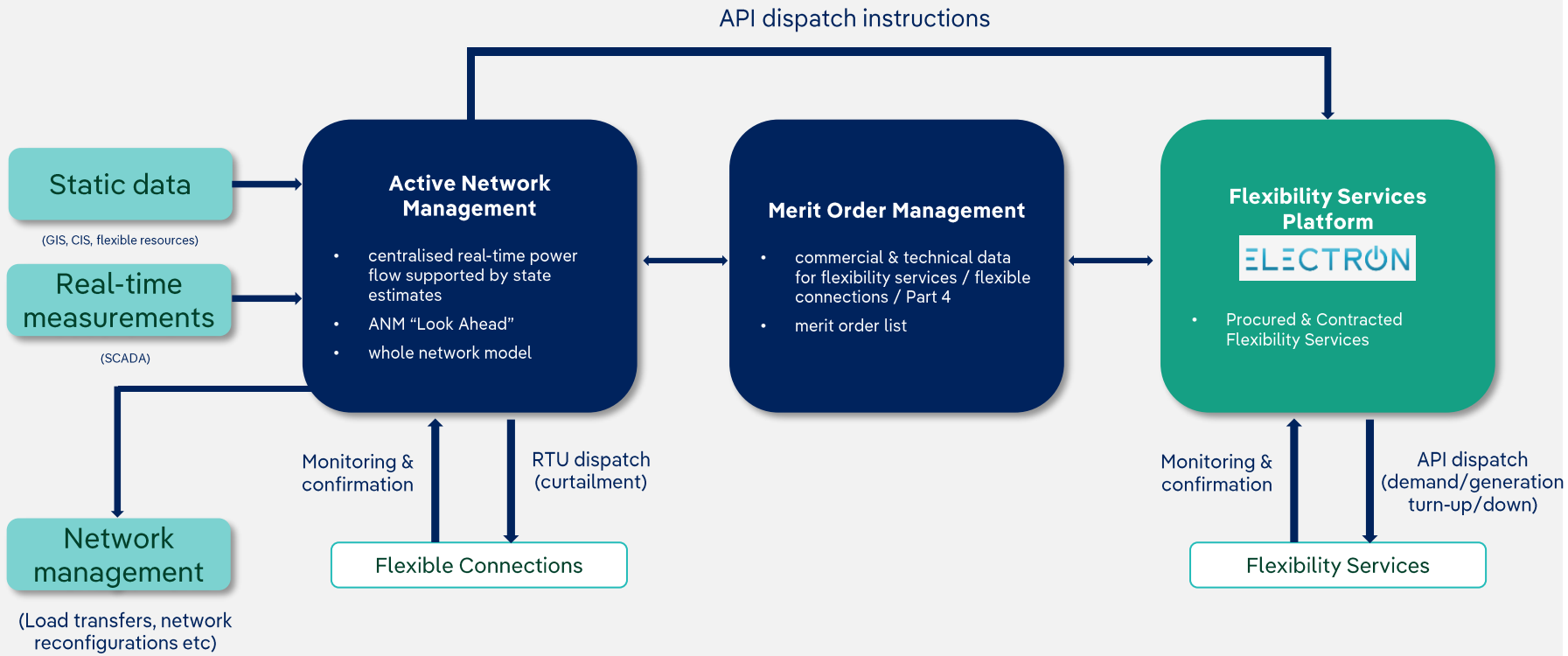
Mitigate/defer load-related reinforcements

Manage uncertainty in our load growth forecasts

Manage planned/unplanned network events (pre- and post-fault)

Release capacity and enable connections

DER Dispatch



We do not dispatch flexible resources unless there is a need to do so when a network event occurs.

ANM DISPATCH PRIOTITY ORDER

1. Flexible Assets
2. Flexible Connections/ Flexibility Services
3. Non-Flexible Connections

Manual override

Allows manual DER dispatch by control engineers when ANM is unavailable or when safety and security require it.

Technology agnostic

Treats all DER technologies equally - whether contracted directly or via aggregators.

Active Network Management

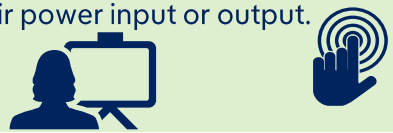
SP Electricity North West

The ANM system is a constraint management system

Connects separate components of a smart grid such as generators, storage devices, controllable demands etc., and **monitors and controls** their operation.

Continually **monitors** all the network constraints in **real time** only **reacts** to network events & alarms caused by a predefined threshold being breached.

Via automated controls, **changes power flows** using flex assets or **instructs** flexible services or flexible connections with the constraint to temporarily change their power input or output.



Our industry leading ANM system went live in January 2025

Curtailment Index

The **order** in which flexible resources are dispatched/ curtailed when a network constraint has been detected is determined by their Curtailment Index.

$$\text{Curtailment Index} = \frac{\text{Actual curtailment throughout the year so far}}{\text{Curtailment allowance for the year}}$$

Curtailment index is **dynamic**; every time a DER is curtailed, its curtailment index value is recalculated.

Key benefits compared to other ANM systems:

- ✓ **Efficient**: ANM + NMS centralised, single real-time topology
- ✓ **Scalable:** Mass scaling in days (not pre-defined tactical solution per GSP)
- ✓ **Robust:** All actions and commissioning are automated
- ✓ **Optimised:** Capacity released for no additional costs to customers before introducing our “flexibility first” approach; Minimises over dispatching
- ✓ **Fairer & Dynamic:** Curtailment Index
- ✓ **Pseudo-pricing:** unbiased deployment of all flexibility solutions (Flexibility Services + Flexible Connections) in the optimal commercial order

Benefits of ANM

SP Electricity North West

Decreases/removes the need for network reinforcement

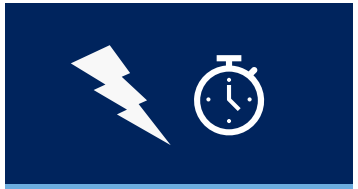
Reduced disruptions (e.g. road closures)

Increased network utilisation

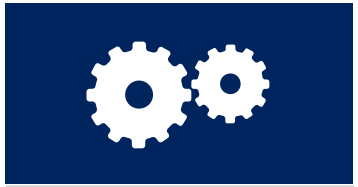
Cheaper bills for customers (potentially in the long-run)

Facilitates the utilisation of Flexible Services

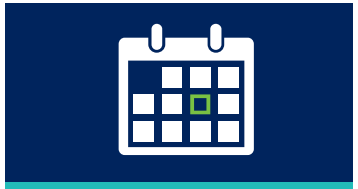
Generates revenue for Flexible Service Providers



Better Quality of Supply (faster restoration time during faults/outages)



Increased security of supply by faster automated switching

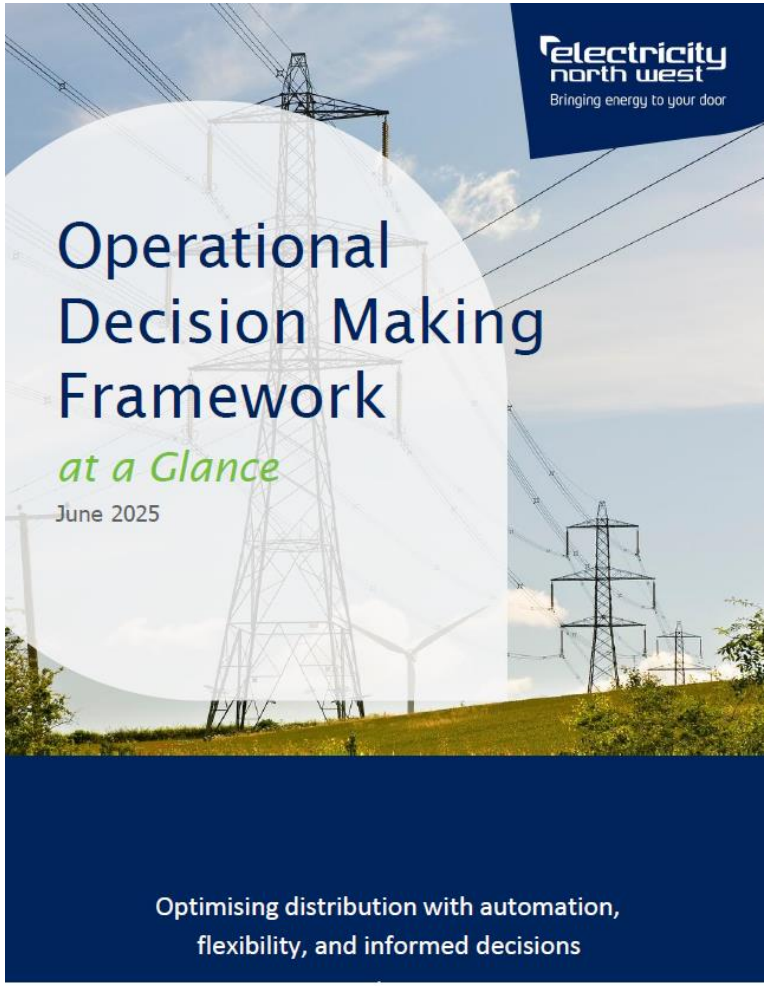


Faster connections

Cheaper connections – using existing capacity of the network

Facilitates a market to be established for users to trade energy

You said, We did



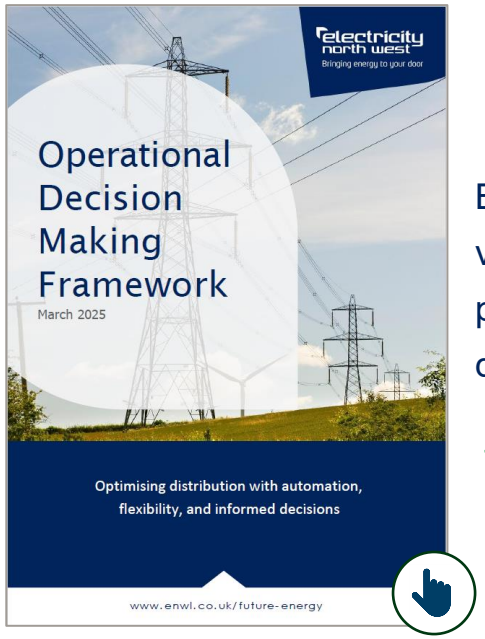
www.enwl.co.uk/future-energy

We published a new summary version of our ODMF in response to stakeholder feedback

ODMF Review & Updates

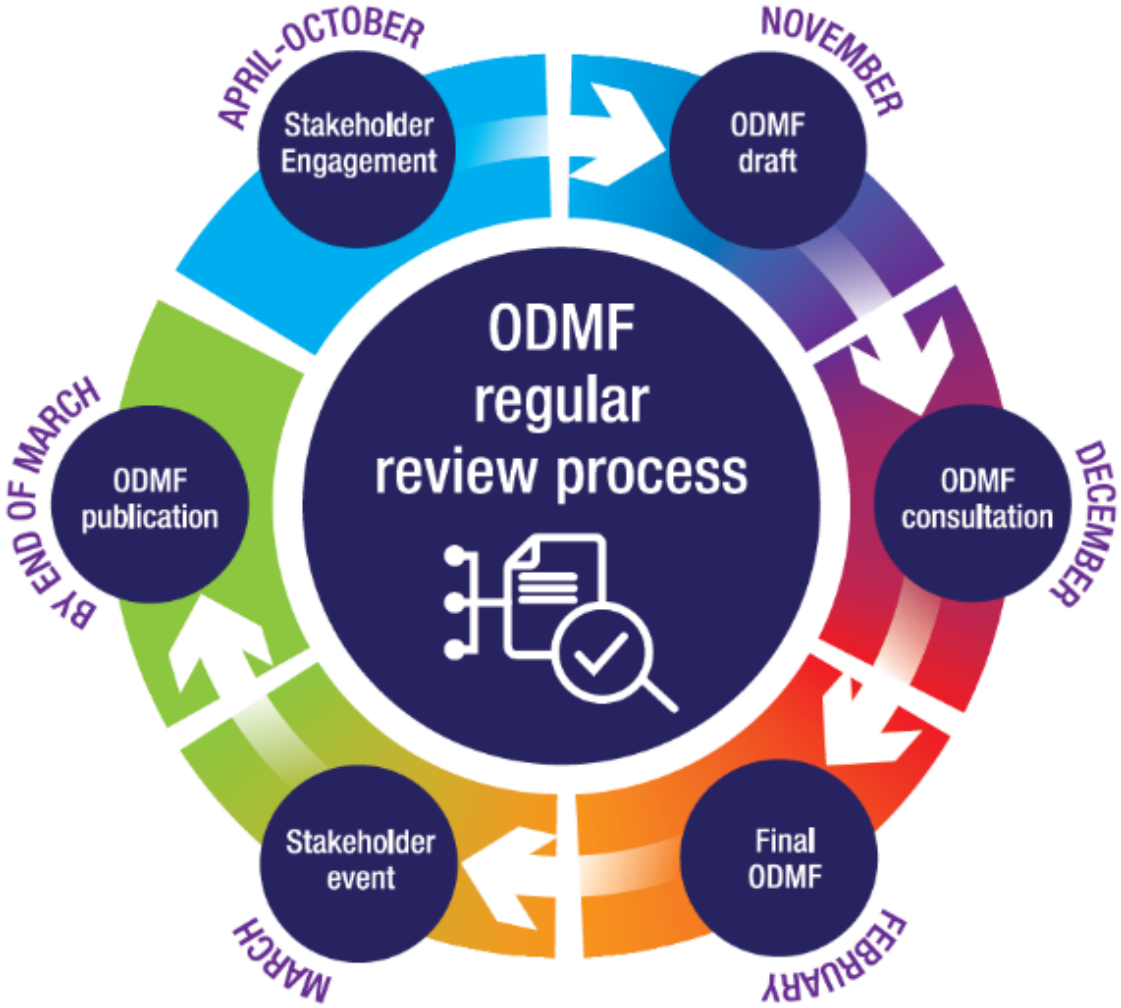
Engage with Us

We welcome your feedback on our Operational Decision Making Framework and invite you to share your thoughts or queries via flexible.contracts@enwl.co.uk



Both the full & “at a glance” versions of our ODMF are published and available for download on our DSO website:

https://www.enwl.co.uk/DSO

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