



DNO view: Investment in, and coordination of new infrastructure

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Who we are

We own and operate two regulated distribution networks, SP Distribution plc (SPD) and SP Manweb plc (SPM). We are the only DNO group to operate across all three nations of GB – Scotland, England and Wales. We also own and operate one transmission network in Central and Southern Scotland, SP Transmission plc (SPT).

Our business is crucial to the delivery of the UK's Net Zero targets and the transition to a more sustainable future.

We are committed to making this happen at pace, and placing our customers and stakeholders at the heart of this journey.

Key facts

>7m people served

across 3.5 million homes and businesses



30,000

substations across our distribution network areas



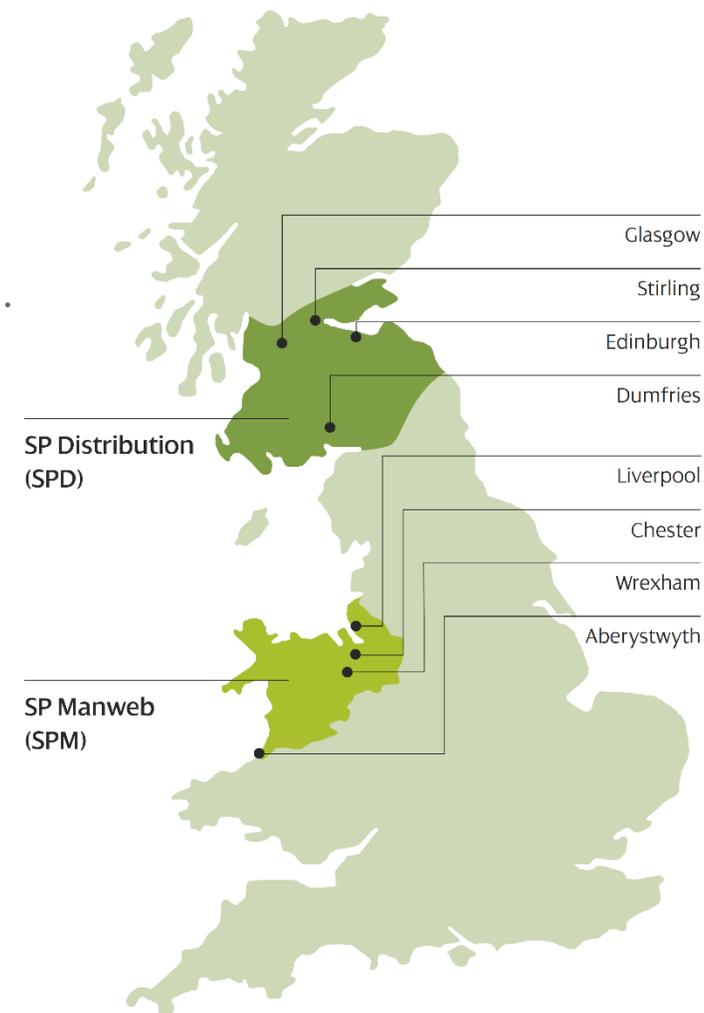
>2,400 employees

across our distribution business



>100,000km

of cables and overhead lines, enough to wrap 2.5x around the world



Planning for Net Zero on our distribution network

	<p>Eight million LCTs by 2050.</p>		<p>Four times distributed generation by 2050.</p>	 <p>Double Peak demand by 2050.</p>
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These customer-led changes far exceed what our networks and systems were designed for creating 4 key challenges:

<p>Create additional network Capacity to ensure can accommodate our customers' EVs, heat pumps, and generation.</p>	<p>Manage increasing Complexity to safeguard the network and whole system, and to enable new markets to operate safely and efficiently.</p>	<p>Recognise increasing network Criticality as our customers are becoming increasingly dependent on their electricity supply for all their activities.</p>	<p>Manage deteriorating asset Condition as utilisation and criticality increase due to greater levels of demand and generation.</p>
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We have a key role to facilitate the transition to Net Zero and tackle the Climate Emergency

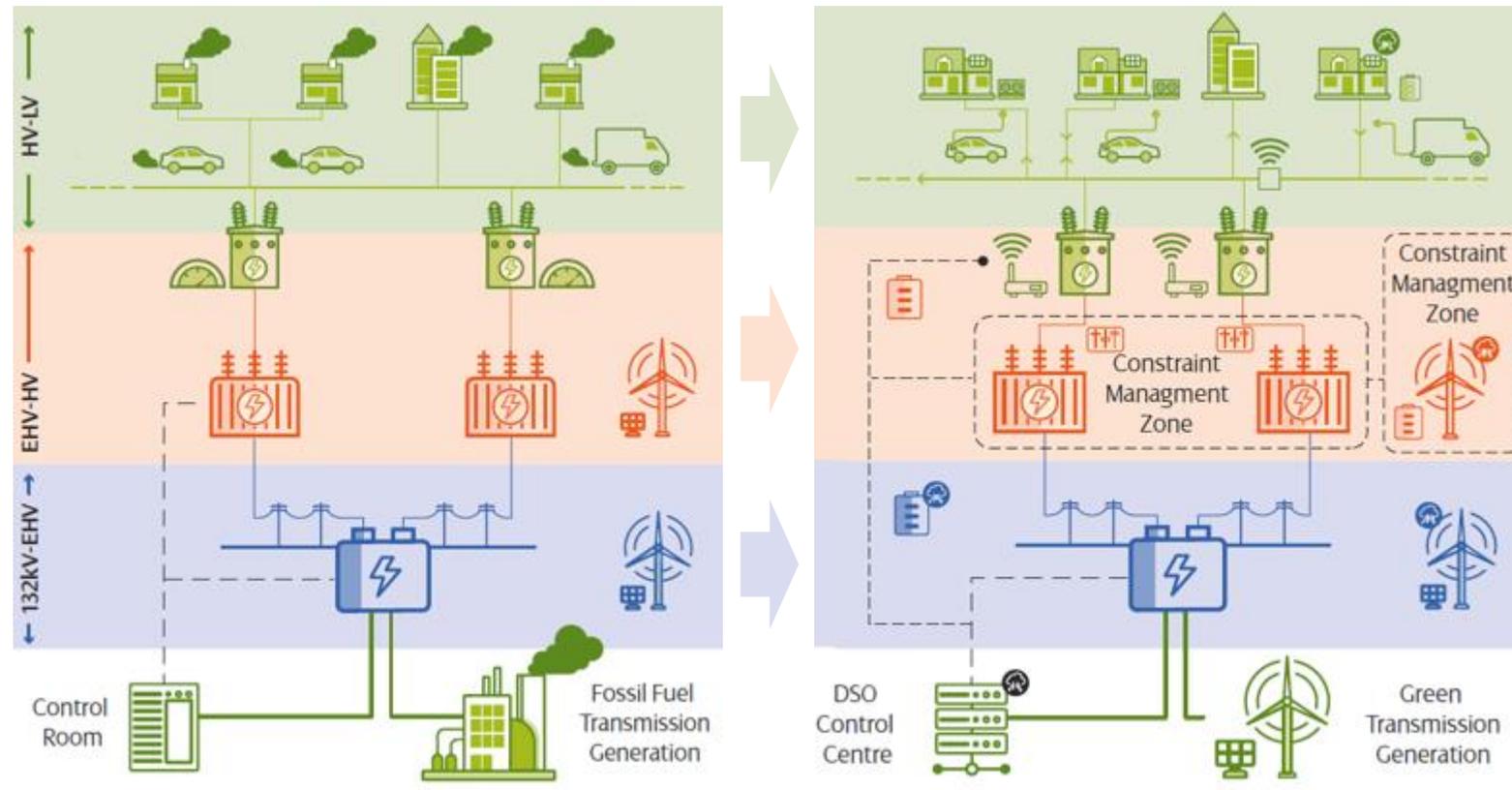
Changing network planning assumptions

The Network Transition

Passive LV network with limited visibility, with manually intensive and operational processes.

High levels of generation have been connected, with the network now its approaching limits.

Closure of large synchronous generation e.g. Longannet, creates *security, operability, resilience & restoration challenges*.



Dynamic LV network with full visibility & control and widescale automation.

Transformation of planning and operational processes using our Data & Digitalisation.

DSO capabilities increase transparency and enable new solutions e.g. flexibility, through advanced analysis, open data, and new markets to manage a more complex interactive system.

Increasing customer requirements, complexity of planning & operation, and whole system interactivity

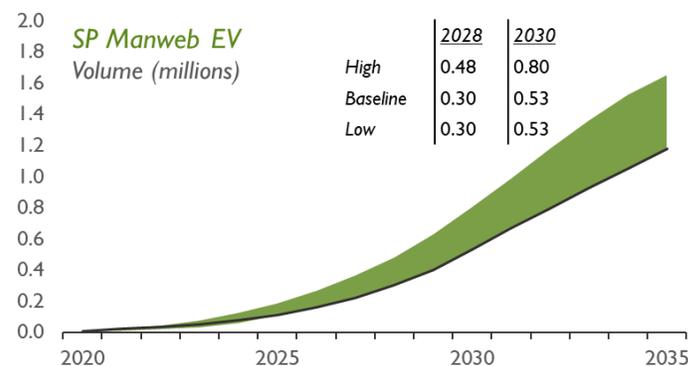
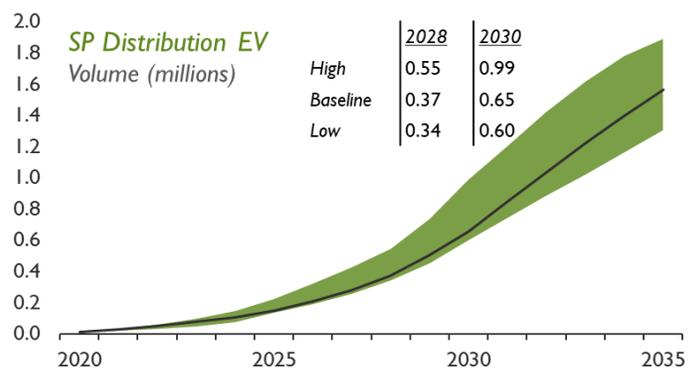
Forecasting our customers' needs

To efficiently plan and operate our network to accommodate our customers' requirements, we first need to understand what these requirements are.

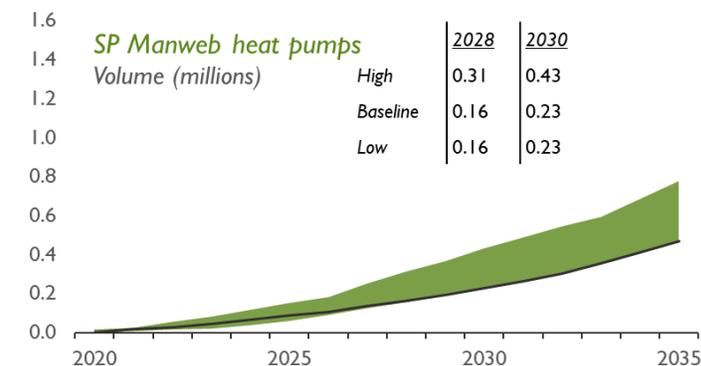
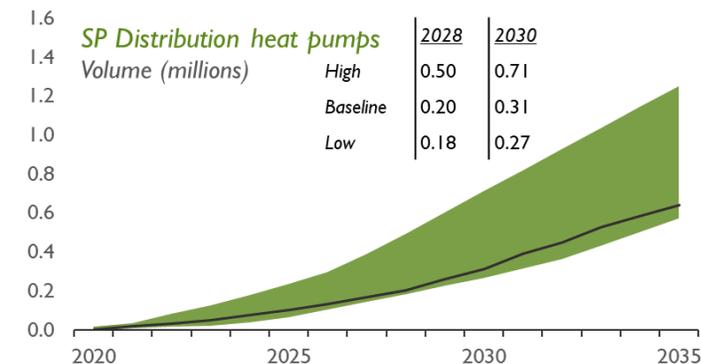
We develop Distribution Future Energy Scenario (DFES) forecasts to do this. We then compare these against Net Zero compliant scenarios from the Electricity System Operator (ESO) and the Climate Change Committee (CCC) to develop our RII0-ED2 investment scenarios.



1.1m - 1.8m
new **EVs** by 2030



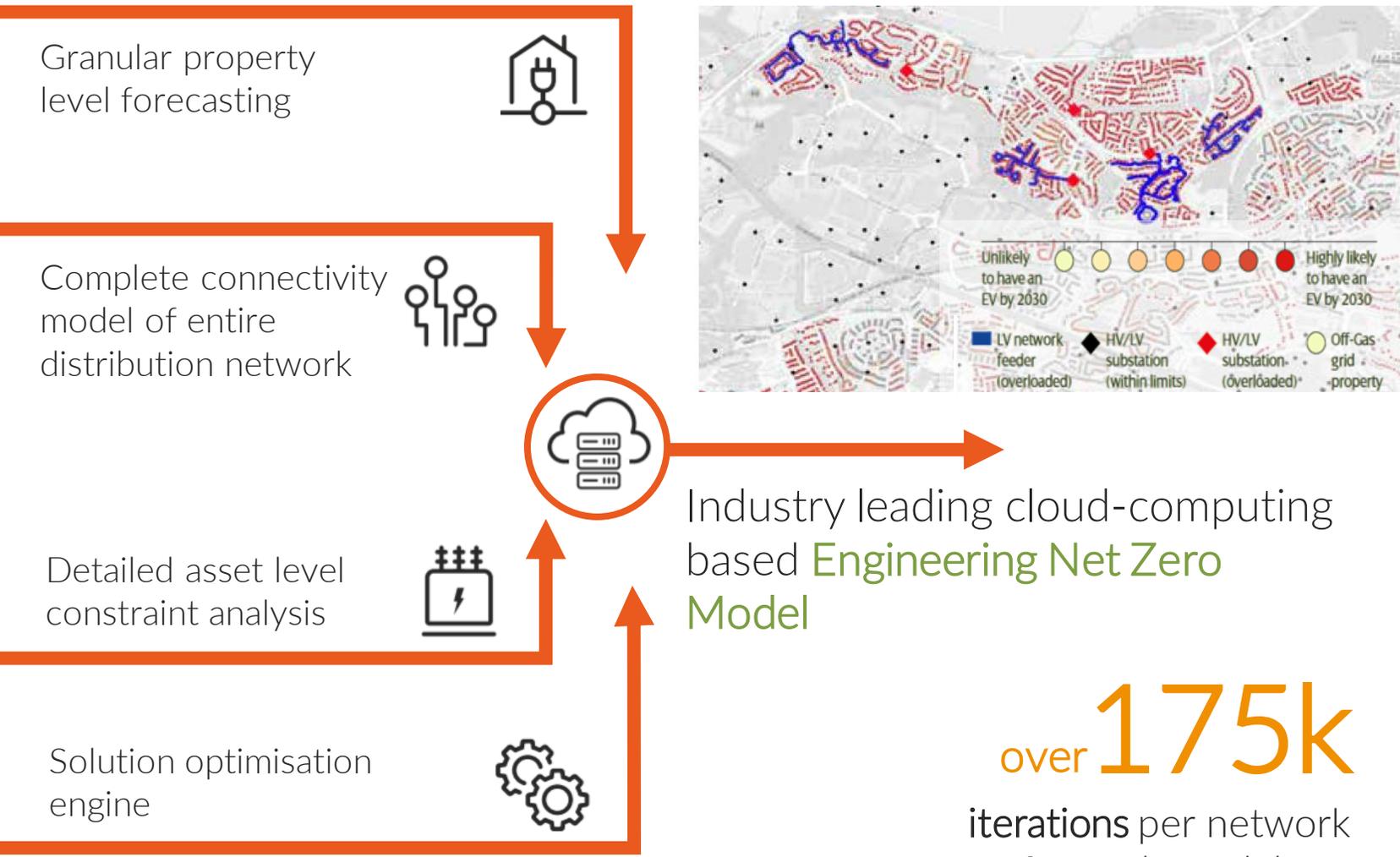
0.5m – 1.1m
new **heat pumps** by 2030



+5.9GW – +7.6GW
new **DG** by 2030

Facilitating the range of credible Net Zero pathways with our delivery strategy flexing accordingly

Engineering Net Zero (ENZ) Model



With the large change in customer priorities, our **asset intervention plan** has never been more important

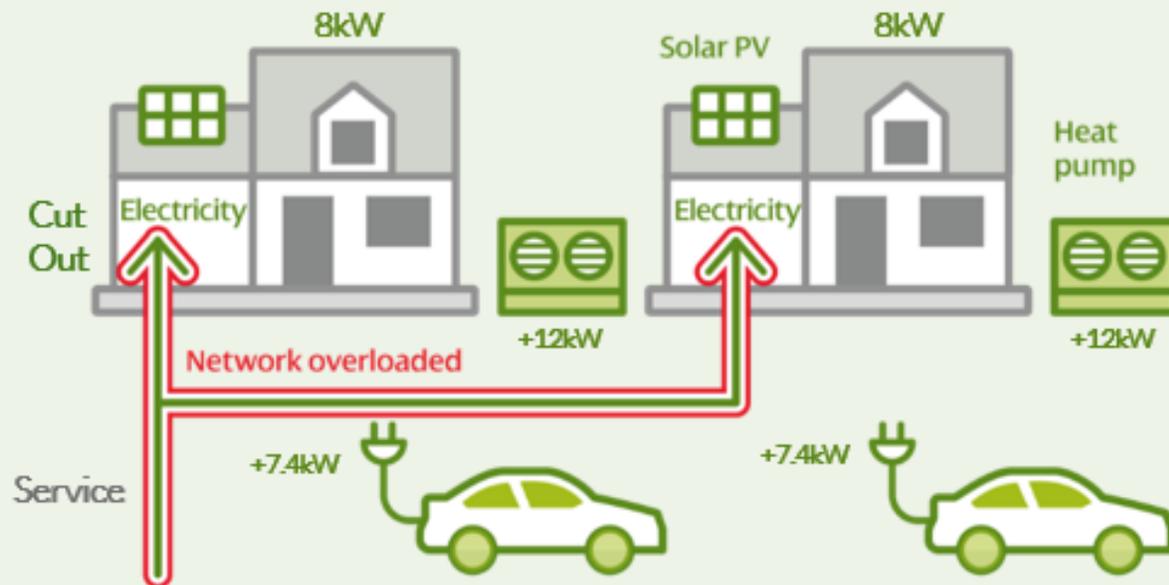
We have been **revolutionising our modelling** capability to facilitate Net Zero.

Industry leading models developed of the entire network to assess forecast demand on every asset and identify optimal solutions.

over **175k**
iterations per network
asset for each model run

The 'Home of the Future' and the LV network challenge

The 'Last Mile' of our networks – the LV system – will be the front line for Net Zero. Uptake of EVs and Heat Pumps will push these assets beyond design limits; ensuring a safe & reliable supply for our customers must continue to be our first priority.



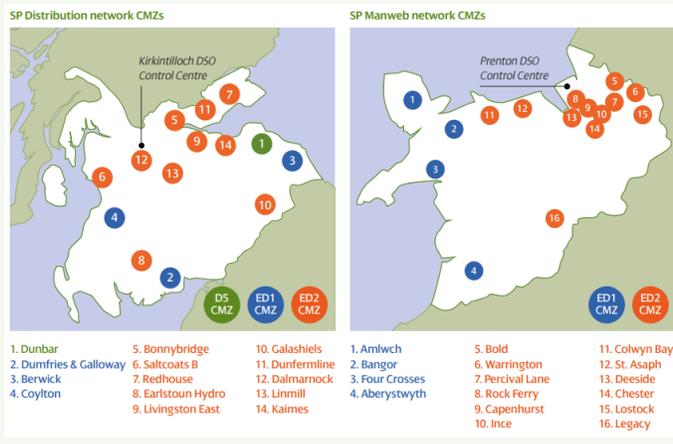
- A typical modern property has an 80A cut-out (18.4kW) fed via a 25mm service cable (24kW)
- Assets can experience up to 3x their safe rating and be dangerously overloaded
- Cannot be managed by smart charging / flexibility due to the scale of overload

Looped Service	Utilisation	
	Cut out	Service
Peak Load	87%	67%
+2 EV *	167%	128%
+2 EV *, +2 HP	298%	228%

DSO infrastructure

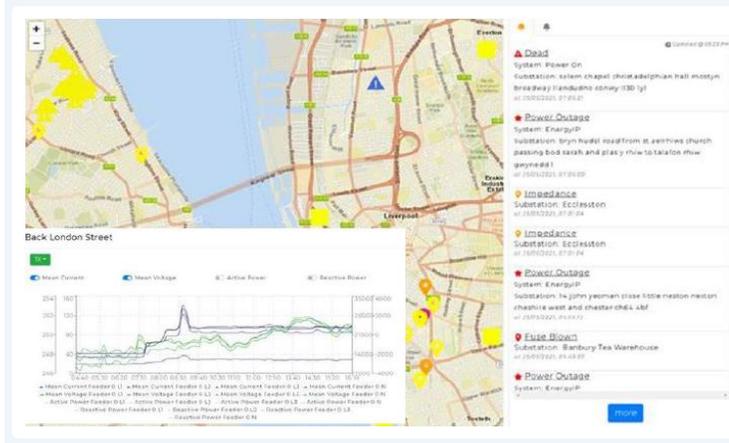
Constraint Management Zones

- 22 constraint management zones in RIIO-ED2.
- These coordinate independent smart interventions and enable us to safely operate a more flexible network.



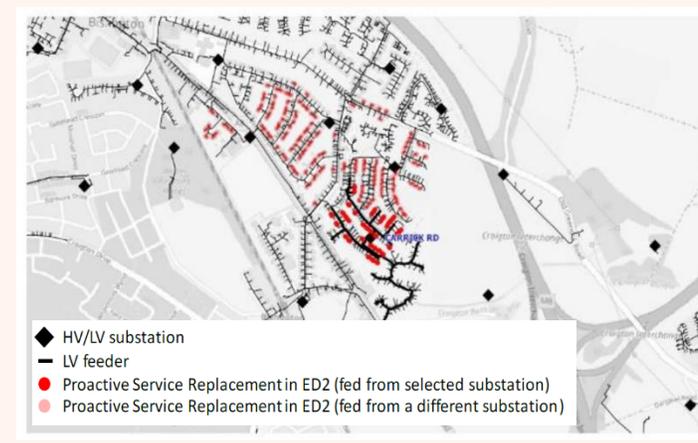
Network monitoring

- 14,102 HV/LV substations within RIIO-ED2, extending coverage from 14% to 76% of customers.
- Incorporating smart meter data to enhance network visibility



Engineering Net Zero Platform

- Integrates a whole network model with different data (monitoring, smart meters, enhanced forecasting, weather correct, LCT notifications, asset condition) – our **network digital twin**. Provides real-time, data-driven insights.

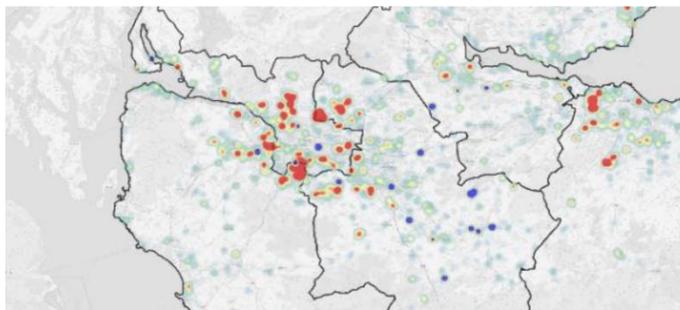


New DSO infrastructure is key to enabling DSO capabilities and activities

DSO outputs

Network planning

- Data-driven interventions comparing all options (incl. flexibility & energy efficiency) and whole system outcomes.
- Planning processes and decisions which are clear and transparent.
- Sharing historical, real-time, and forecast planning & operational data.



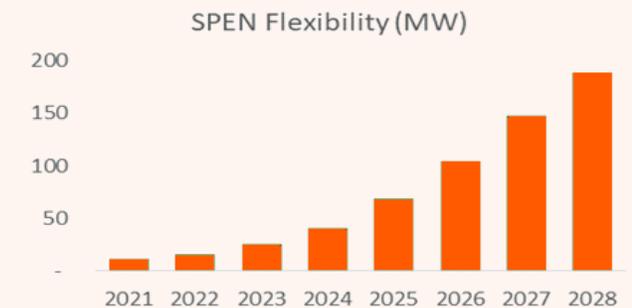
Network operation

- Increasing network utilisation, coordinating smart tools, managing technical losses, and making more use of operational interventions like flexibility.
- More visibility and industry-leading forecasting and analytics.
- Whole system operational coordination to ensure system efficiency, stability, and resilience.



Market development

- Supporting flexibility market growth, reduced barriers to participation, and enabling multiple market participation.
- More efficient, real-time flexibility market functioning, and operational coordination with the ESO.
- Acting as a neutral market facilitator through transparency and external assurance



Delivering DSO outputs so we safely, efficiently, and reliably enable Net Zero



Thank you

*If you'd like to find out more visit:
www.spenergynetworks.co.uk*