

Network Development

Kempley Parish Council

14 November 2024



The energy landscape is changing at an unprecedented rate to meet decarbonisation targets

- ▶ By 2050 annual electricity demand is expected to **double from 286TWh in 2022 to 726 TWh*** - this will be driven by demand from low-carbon technologies (LCTs) like EVs and heat-pumps
- ▶ To meet increasing demand and achieve decarbonisation of the power sector by 2035, a number of significant reforms are taking place across the sector:
 - ▶ Formation of **Distribution System Operators (DSOs)** to maximise capacity in the network today and forecast the network required in the future
 - ▶ Formation of **National Energy System Operator (NESO)** and introduction of national and regional **strategic planning** (Regional Energy Strategic Plans (RESP))
 - ▶ **Connections reform** across transmission and distribution networks
 - ▶ **Planning reform** to speed up connections and new infrastructure build

Distribution System Operator

Strategically planning and investing in our network for net zero

Emily Taylor – Strategic Engagement Officer

Investing in our network

Strategic Investment Process



Forecasting



The **Distribution Future Energy Scenarios (DFES)** identify how customers will use our network in future

Network Impact Assessment



The **Network Development Plan (NDP)** uses forecasts to analyse and identify future network constraints

Optioneering

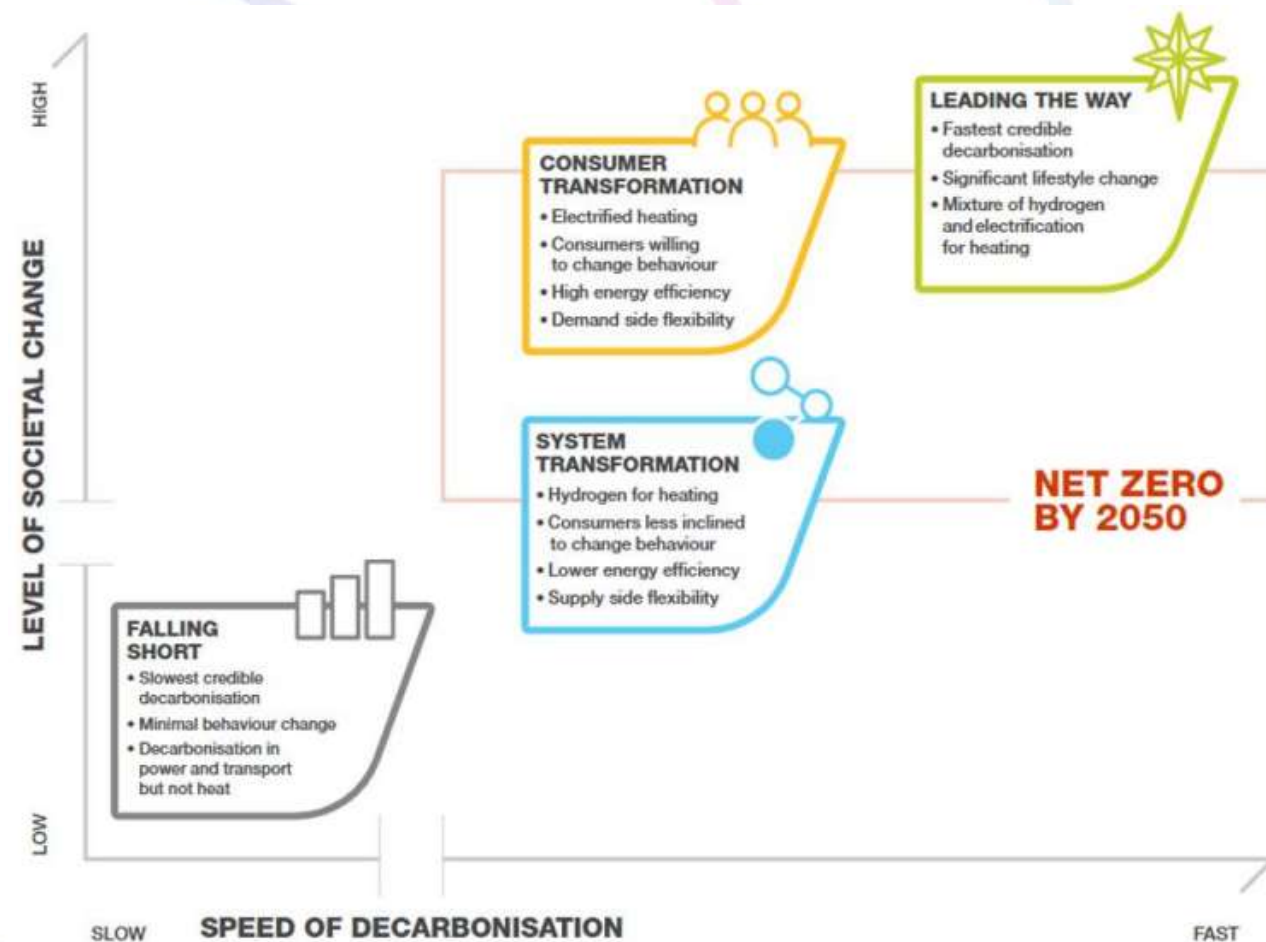


The **Distribution Network Options Assessment (DNOA)** outlines how we plan to invest in our network to solve constraints

What is DFES?

The Distribution Future Energy Scenarios (DFES) outline a range of credible futures for connections to the distribution network.

- We work with Regen to undertake the DFES analysis out to 2050 in all four licence area annually
- Bottom up process
- The ESO FES scenarios are used as the overarching scenario framework for the DFES
- This is consistent across all DSOs



What is DFES?

DFES are scenario-based projections of new load expected to connect to our network as the UK transitions to net zero.

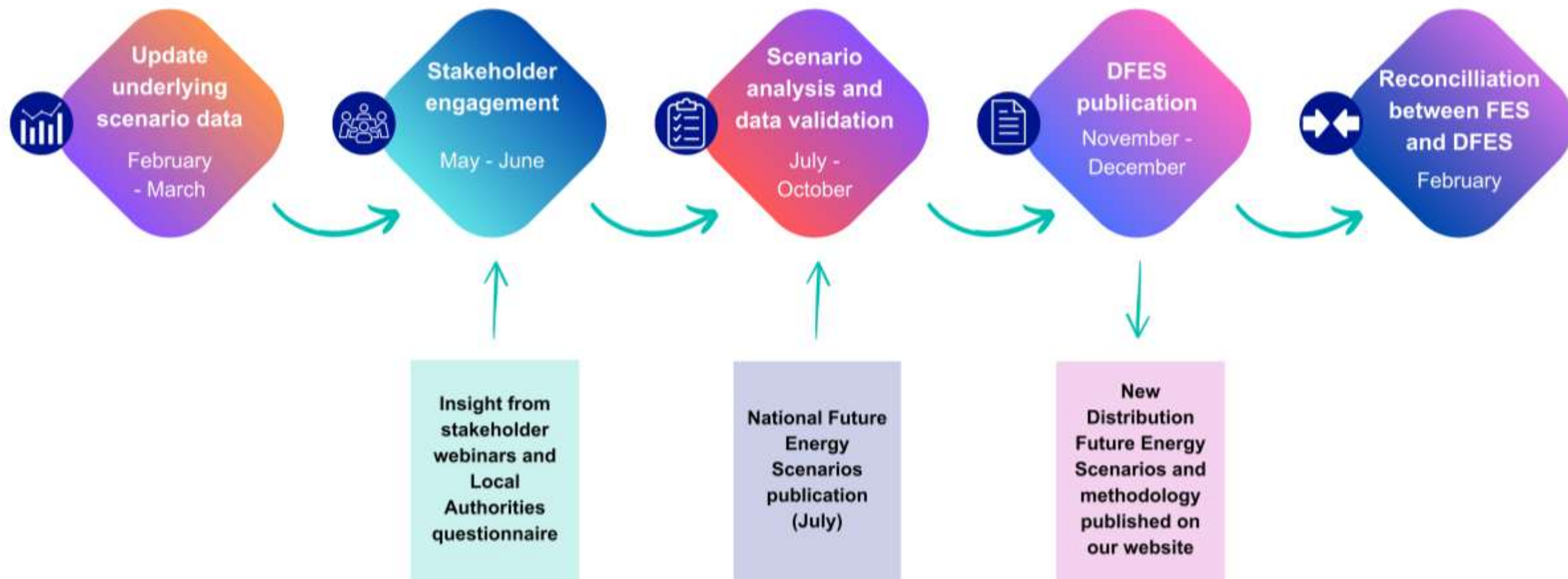
This covers a range of demand and generation technologies:

- New housing developments
- Renewable Generation
- Hydrogen electrolysis
- LCTs (heating, transport)
- Decarbonisation activities of major energy users

Using a range of input sources and analysis:

- Local authorities' local development plans
- Stakeholder Engagement
- Local Area Energy Plans
- Census data
- Geospatial analysis:
 - Renewable energy resources
 - Building stock
 - Socio-demographics
- Connections pipeline analysis

DFES annual cycle?

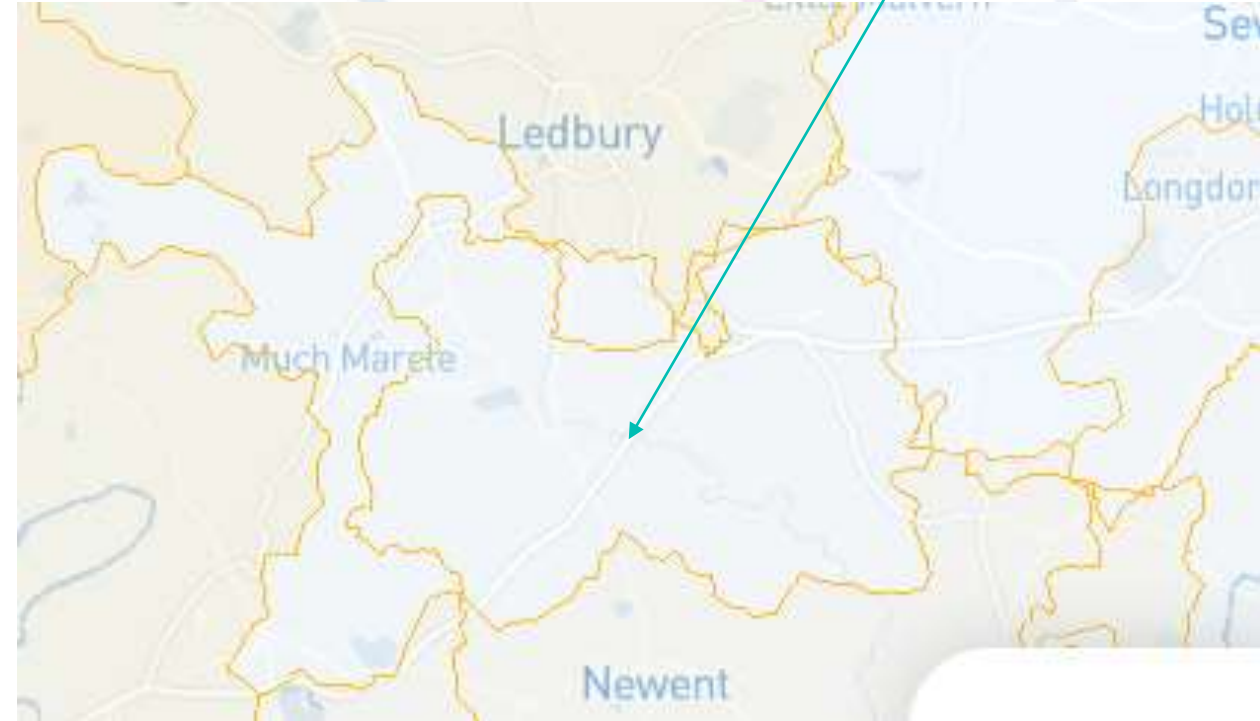


Dymock Primary

What does the Network Development Plan account for in the next 10 years:

- 162 new domestic dwellings
- 967 heat pumps
- 2,597 registered Electric Vehicles
- Over 4 MW of additional generation and energy storage projected to connect to our network

Dymock Primary area



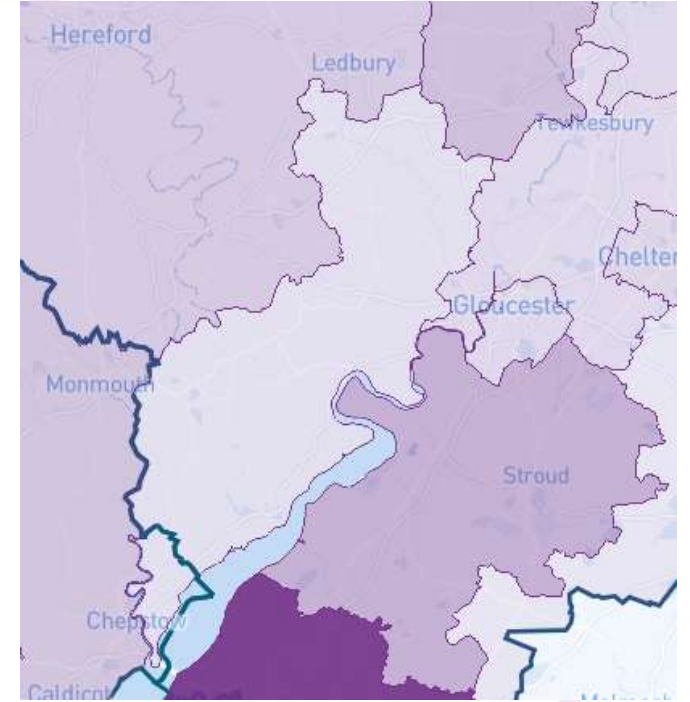
National Grid – Distributed Future Energy Scenarios

Forest of Dean

What does this Network Development Plan account for in the next 10 years:

- 6,486 new domestic dwellings
- Nearly 9,000 more Heat Pumps
- Nearly 20,000 registered Electric Vehicles, with 76.4MW installed capacity for charging
- 116 hectares of new industrial and commercial floorspace
- Over 150 MW of additional generation and energy storage projected to connect to our network

[National Grid – Distributed Future Energy Scenarios](#)



Scan to access the webpage

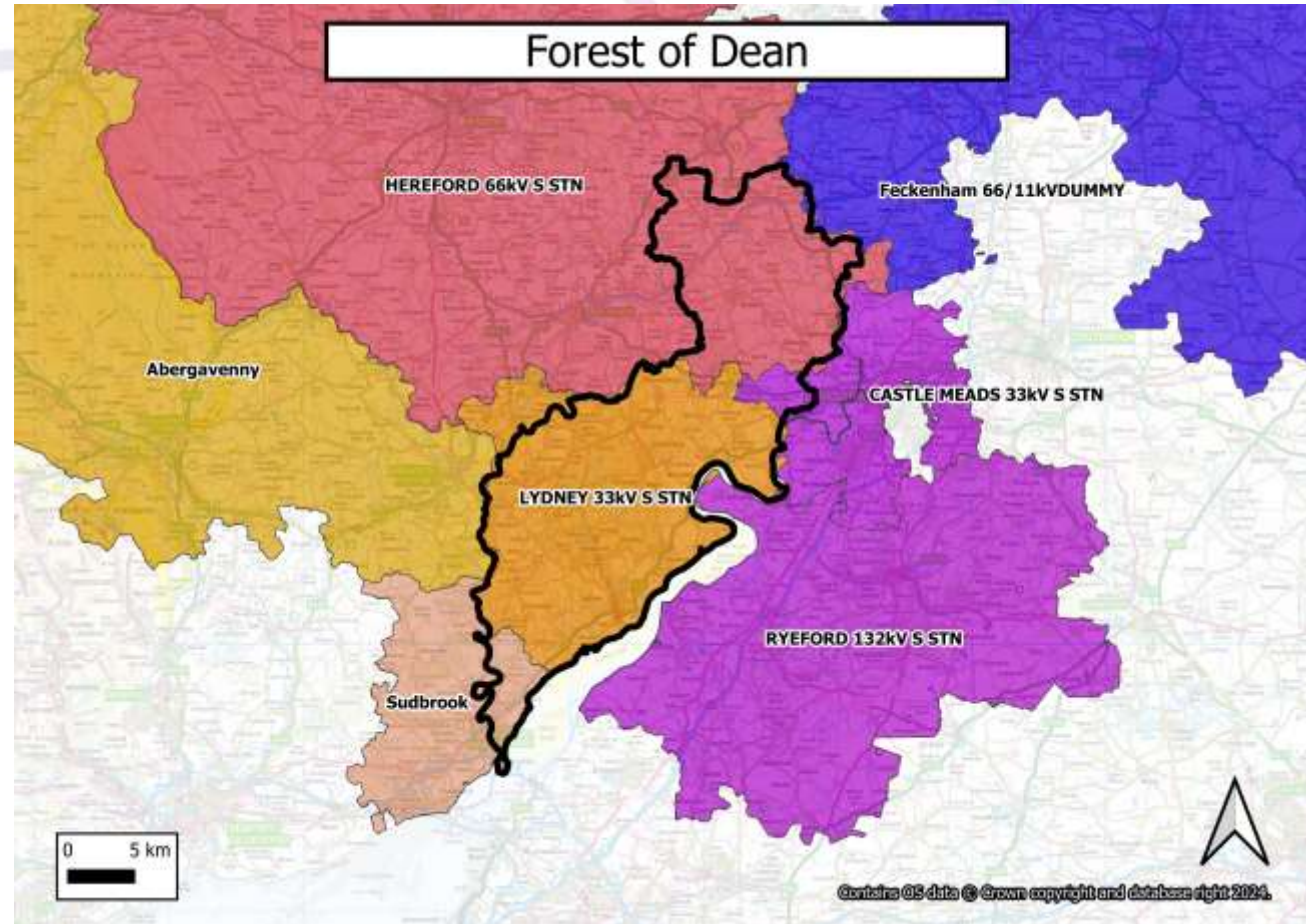
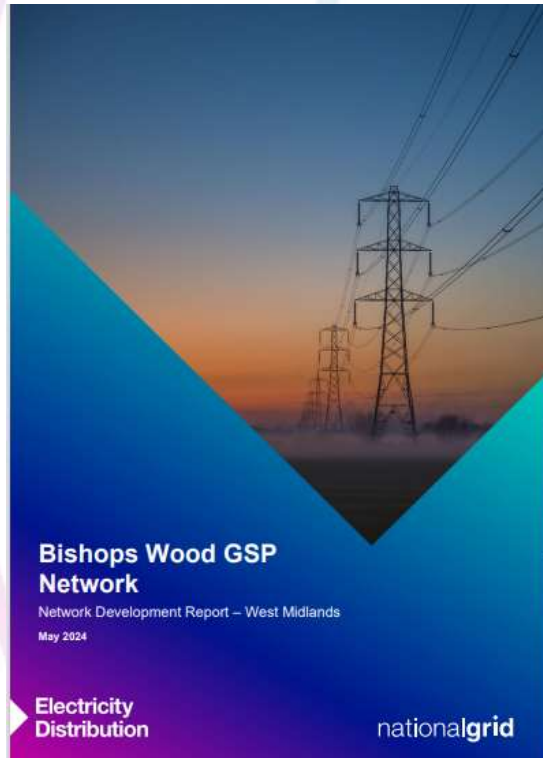
Network Development Plan

What is it?

- Condition of the Electricity Distribution Licence (25B), which we are required to publish every 2 years
- The latest plans were published on 1st May 2024 and are available on our website
- The Network Development Plan assesses the future suitability of the primary distribution network for continuing to deliver for customers under credible future energy scenarios across the next 10 years
- Future constraints on the network are identified by overlaying the DFES projections on our network models and different solutions to the constraints are proposed

Kempley Parish Council

Network Development Plan



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National Grid - Network Development Plan

What about the here and now

- ▶ Primary and Secondary Network Design
- ▶ Major projects
- ▶ New connections
- ▶ But anyone can see our network capacity



Network Capacity Map

- High voltage
- This shows our network capability to connect large-scale developments to major substations
- You can explore network capacity for both demand and generation.



EV Capacity Map

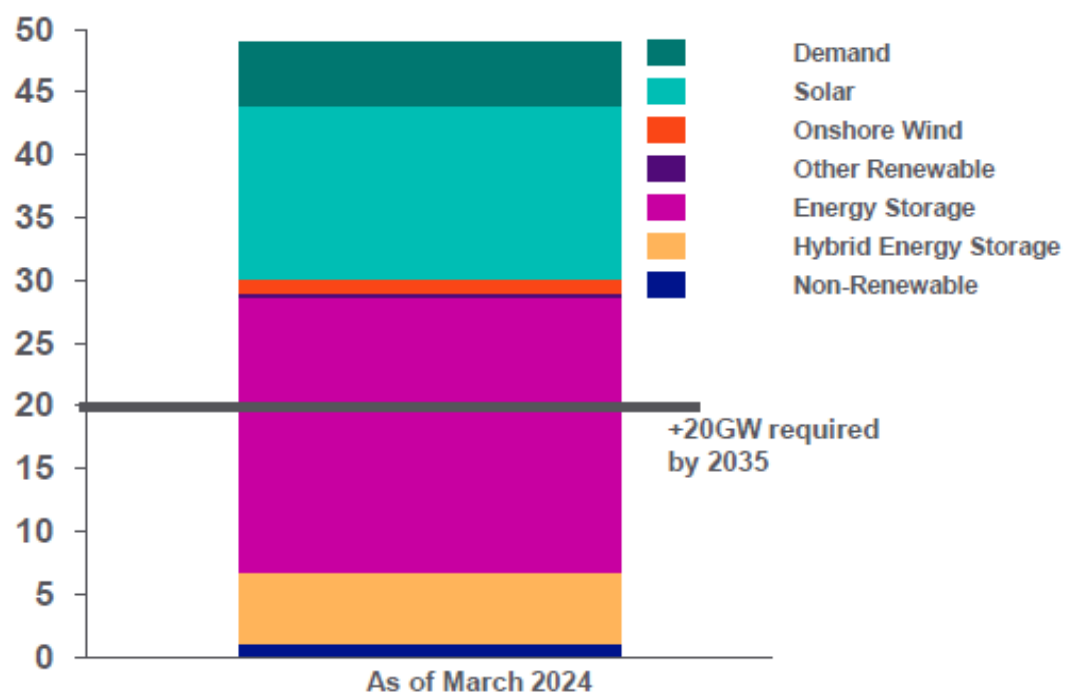
- Low voltage
- Shows capacity available on our network to support the connection of Low Carbon Technologies such as electric vehicles and heat pumps.



Connecting generation

The NGED connections pipeline is larger than ever, at around 49GW - over double the amount needed by 2035

Current NGED Pipeline (GW)



- Applications to connect to our network have increased by **900% in the last 5 years**
- We have already connected **12GW of generation** to our network
- Last year we connected **97% more large-scale** distributed generation schemes than the year before

So what is happening – connections reform

Changes to existing process

»»» Window and gated process

↻ Evidencing progress

» Request for accelerated connection date

Benefits Realised

🧱 Raises barriers to entry

🚧 Queue Management

🔌 First ready, first connected



National Energy System Operator (NESO) Criteria - Project Designation Criteria

Projects may be prioritised ahead of others in the queue if designated:

- 1 Critical to Security of Supply – relating to Dx & Tx
- 2 Critical to System Operation – significant gen, networks, SCADA, balancing services, cyber security
- 3 Materially reduce system and/or network constraints
- 4 Technologies and / or highly innovative (not in CP30)
- 5 Very long lead times



Questions

national**grid**

