Public

Strategic energy planning for the net zero transition

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Joint Radio Company Members Event – ‘Accelerating the net zero transition’ – 14/11/24

NESO
National Energy System Operator

1. The role of an electricity system operator
2. The roles of NESO
3. Strategic Energy Planning
4. Clean Power 2030 and Connections Reform

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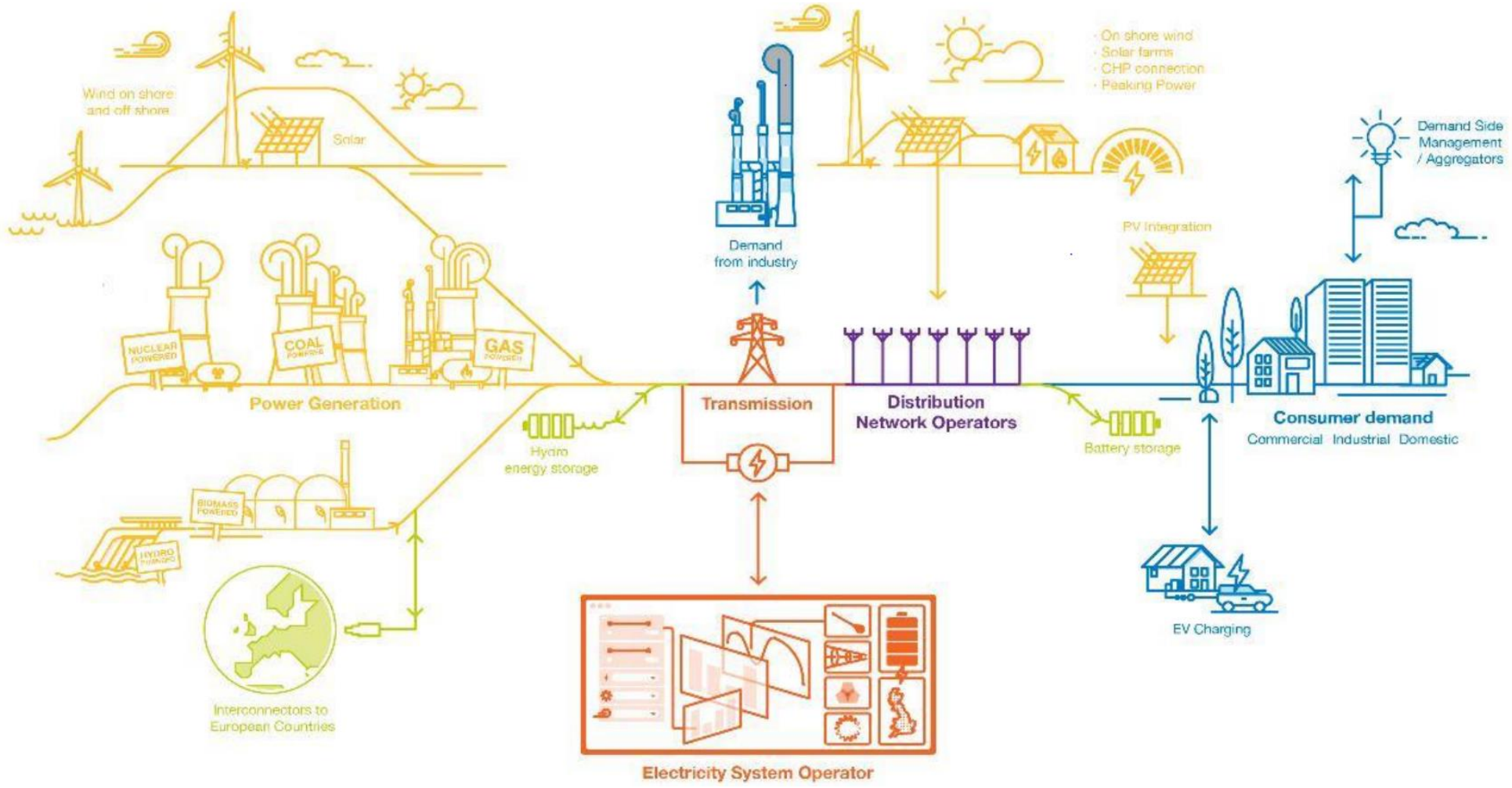
How the electricity system ***used to*** work

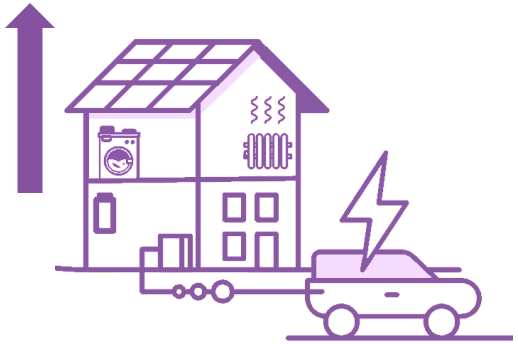


This diagram is out of date – just for the history!

The electricity system is changing as it decarbonises, which creates new challenges for system operation

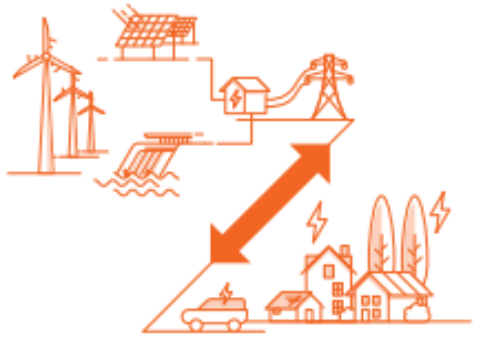
Less dispatchable generation

More asynchronous generation



More variable and unpredictable demand

More variable sources of generation



Generation moving to different areas

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NESO Timeline

History of the System Operator:

1989
The Electricity Act was approved by parliament, which paved the way for privatisation of the electricity industry.

1990
National Grid was established, creating one regulated company for England and Wales to provide transmission infrastructure and a marketplace; not to buy or sell energy itself.

1996
Our control room, the Electricity National Control Centre (ENCC) was established, in Wokingham.

Legal Separation of the Electricity System Operator:

April 2019
National Grid Electricity System Operator (ESO), became a legally separate business within the National Grid PLC Group.

The Formation of the National Energy System Operator:

April 2022
Following industry consultation, the UK government decided that the Future System Operator would be a public corporation free from commercial interests and operationally independent.

October 2023
The Energy Act 2023 was passed with cross-party support, legislating for a Future System Operator to be created.

January 2024
The ESO announced the new name for this entity as the National Energy System Operator, or NESO.

October 2024
NESO is established.

The UK's 2023 Energy Act set the legislative framework for an independent system planner and operator to be set up to help accelerate Great Britain's energy transition, leading to the establishment of the National Energy System Operator (NESO).

Our Primary Duties

NESO will promote the following three objectives:

Net Zero
Enabling the Government to deliver on its legally binding emissions targets.

Efficiency & Economy
Promoting efficient, co-ordinated and economical systems for electricity and gas.

Security of Supply
Ensuring security of supply for current and future customers of electricity and gases.

Our Secondary Duties

NESO will also have regard to:

Facilitating Competition
Creating and maintaining competitive energy markets and networks.

Consumer Impacts
Understanding what changes mean for consumers.

Whole System Impacts
Understanding linkages across systems.

Facilitating Innovation
Creating an environment that enables others to help solve energy challenges.

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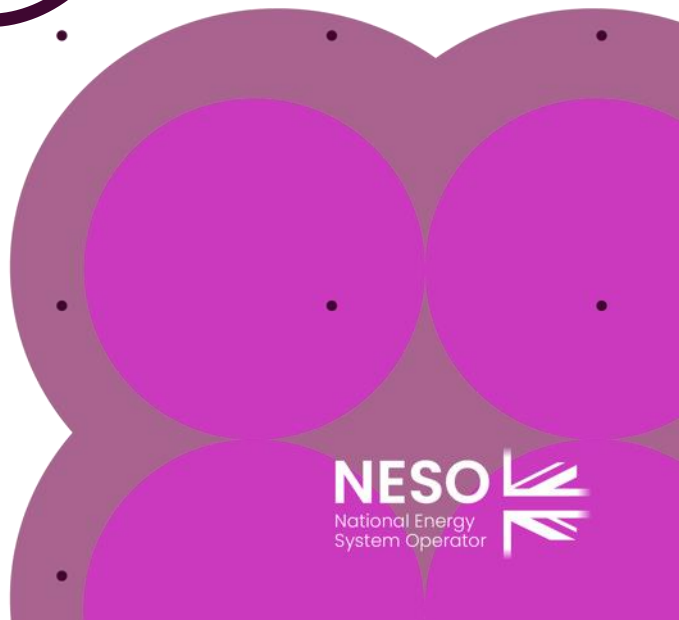
NESO was created to integrate strategic whole energy system roles

NESO has all the roles of the ESO, plus some new ones (most of which have an acronym!)

1. GWEND – Gas and Whole Energy Network Design
2. SSEP – Strategic Spatial Energy Planning
3. CSNP – Centralised Strategic Network Planning
4. RESP – Regional Energy Network Planning
5. OREM – Office of Resilience and Emergency Management
6. Competition in onshore electricity transmission network development
7. Advisory – Formal duty to provide government with technical advice

Strategic Energy Planning



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Future reforms to system planning

Pre 2030 → **Post 2030**

CP2030

Advise government on which network upgrades, market and policy decisions could accelerate the development of a clean power electricity system by 2030.

UK Government response to CP30 advice to be published by end of 2024

Adopted Clean Power 2030 advice by Government feeds into the background assumptions underpinning all three Strategic Plans.

Supply and demand projections from Future Energy Scenarios (FES)

DESNZ data inputs and assumptions

SSEP

Spatial supply and demand modelling based on network needs. Focus on optimisation of technologies against cost, environment, community impact.

Key stakeholder inputs

Environmental, societal and geospatial expertise

Long term feedback loop

CSNP

Whole system plan for the development and assessment of high-level investment options for transmission networks.

RESP

Focus on developing whole system, cross-vector regional plans with input from local actors.

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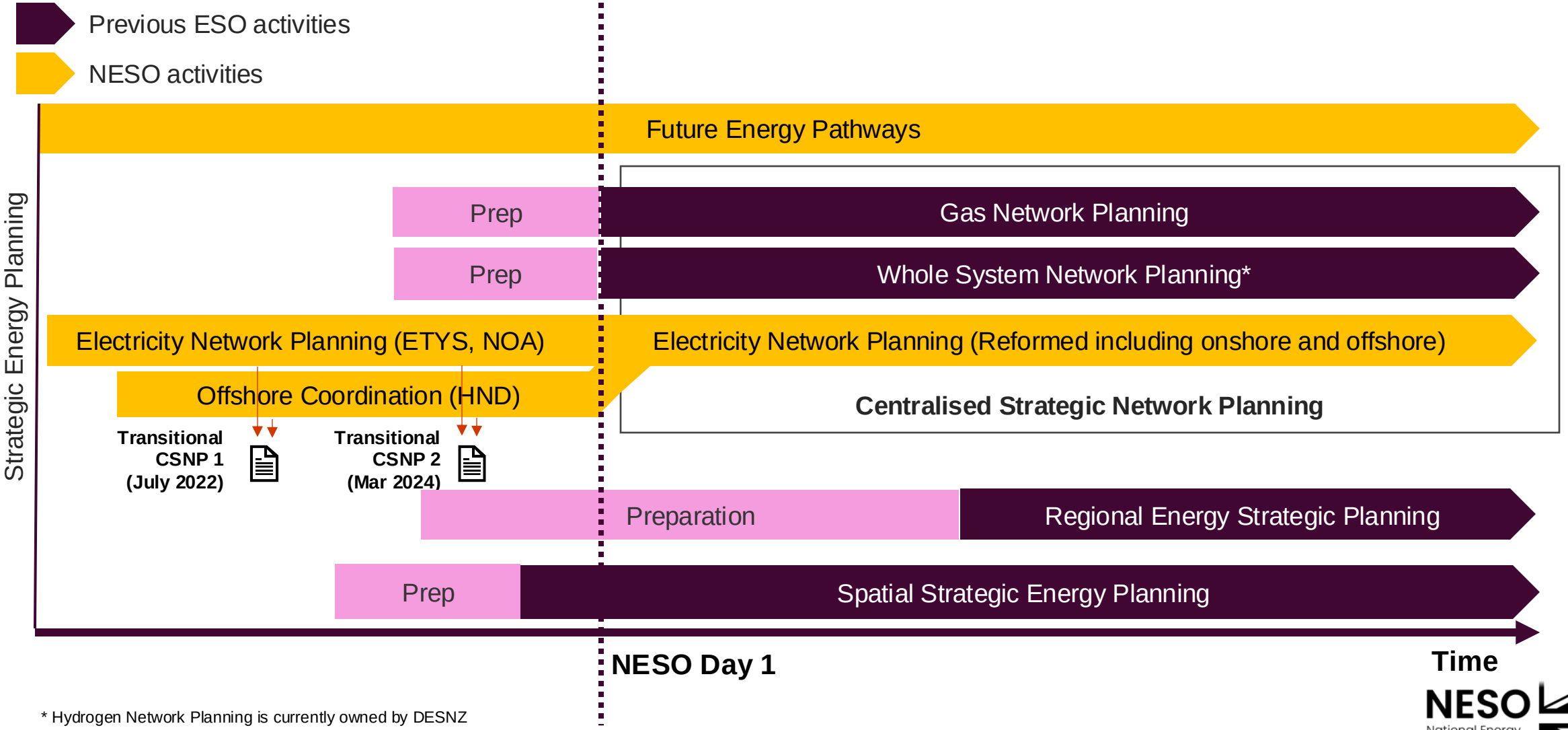
Several new roles are under development so that NESO can ultimately coordinate design and planning efforts across whole energy



* Hydrogen Network Planning is currently owned by DESNZ

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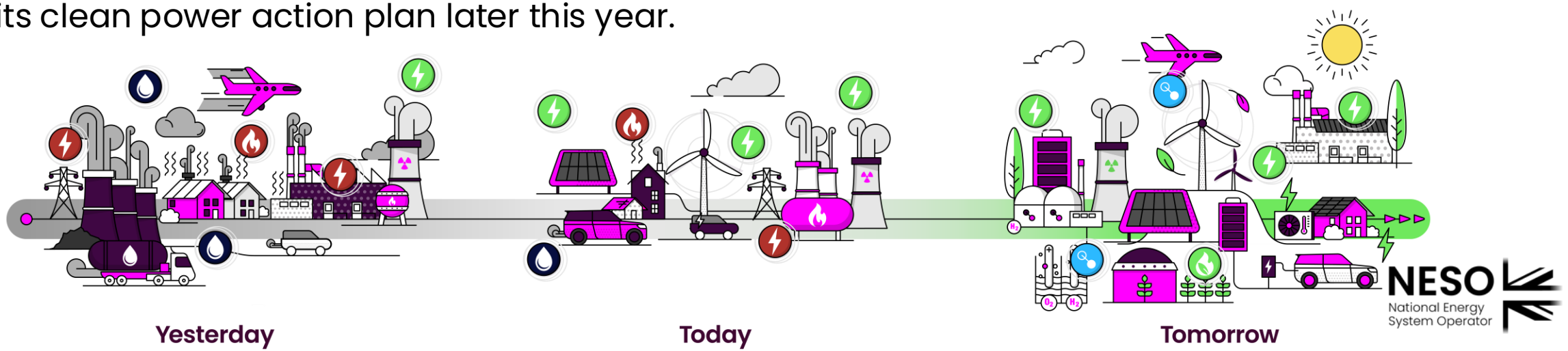
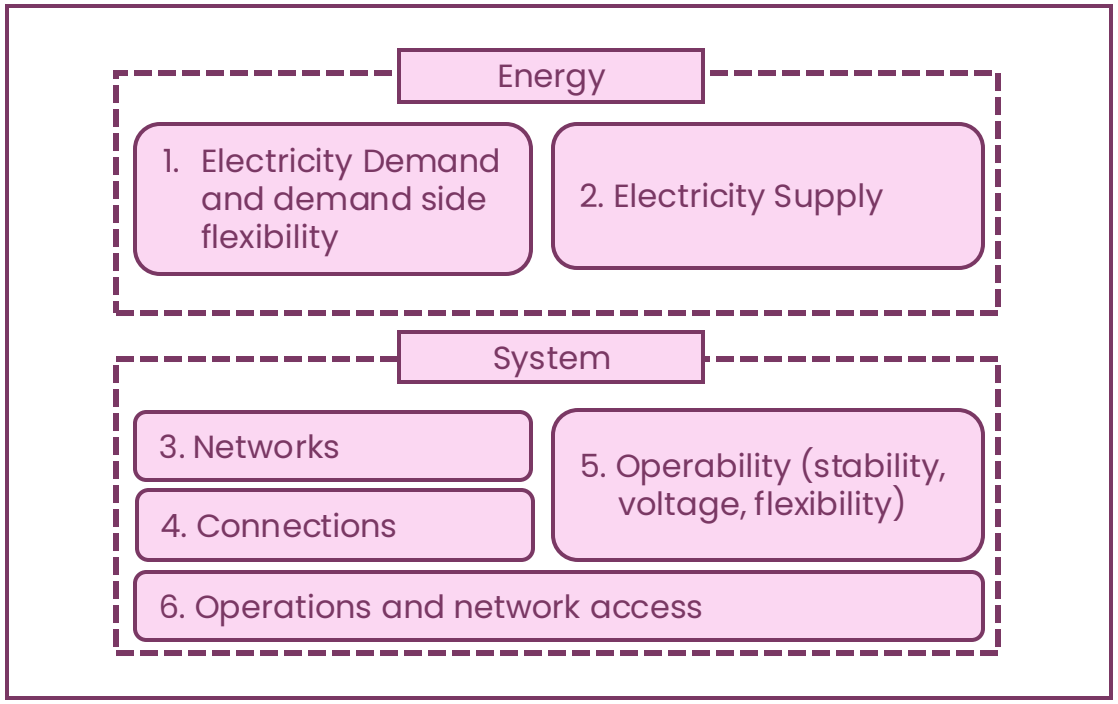
What Government asked NESO to do

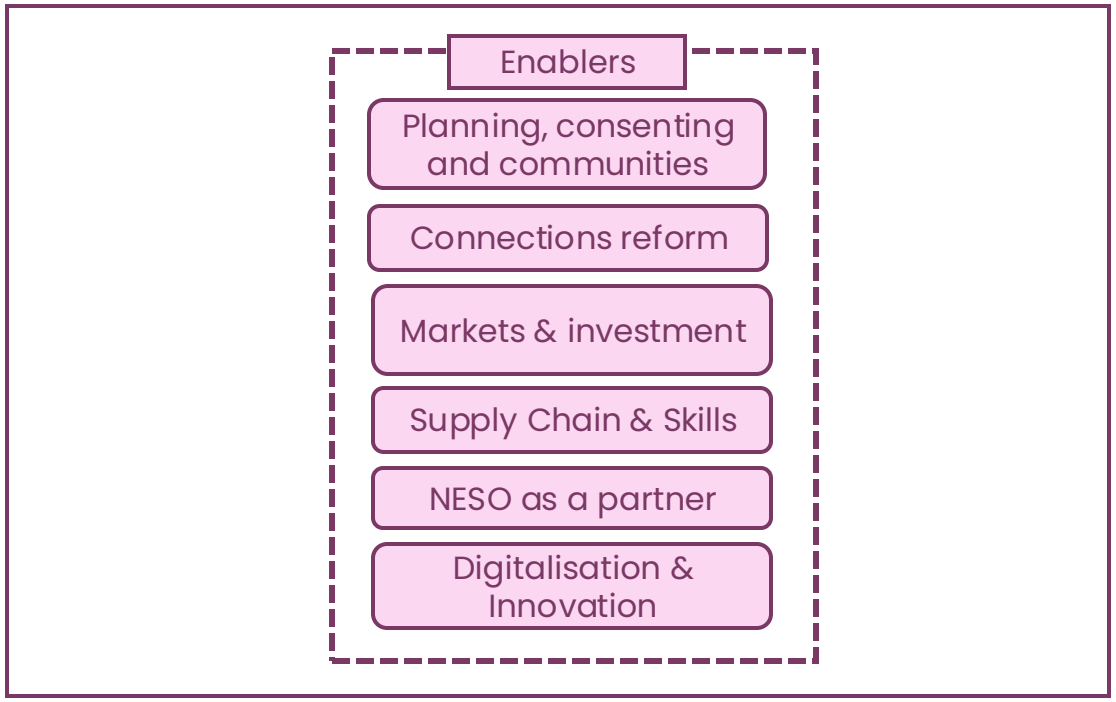
The Government has an ambition for Britain to be supplied with clean power by 2030. The Government has made Clean Power one of their five missions. Mission Control, led by Chris Stark, is overseeing the delivery of a clean power 2030 action plan, consistent with long-term net zero, security of supply and affordability objectives.

The National Energy System Operator was asked to provide independent advice on the pathway towards the 2030 ambition, with expert analysis of the location and type of new investment and infrastructure needed to deliver it. We submitted our advice to Government and published it in November 2024. Government will now consider the advice in developing its clean power action plan later this year.



Components of NESO's clean power analysis





Critical considerations such as **emissions and environment, consumer and community impacts, energy security, whole energy, beyond 2030 and economic impact** cut across the six key elements.

CP30 Headline Findings

- **Clean power by 2030 is achievable** - though outer edge of feasibility. It will be a herculean effort.
  - **Required capacity less than that in current connections queue**.
  - **Network requirements broadly in line with '*Pathway to 2030*' Holistic Network Design** (2022) – need to deliver.
- **Clean power will require doing things differently**, establishing and maintaining momentum every year to 2030
  - **Key elements for success:** demand and supply flexibility, renewables acceleration, delivering FOAK technologies, timely network expansion, gas stays on but operates much less.
  - **Key areas for action:** planning reform; connection reform; market reforms; community engagement; supply chain; data/digital; and regulatory approvals.
- **Clean power can bring benefits for GB**
  - **Help meet carbon targets** and create local industrial and job opportunities
  - **Cut the link with gas prices**, without increasing costs to consumers
- **Broad stakeholder support for analysis**

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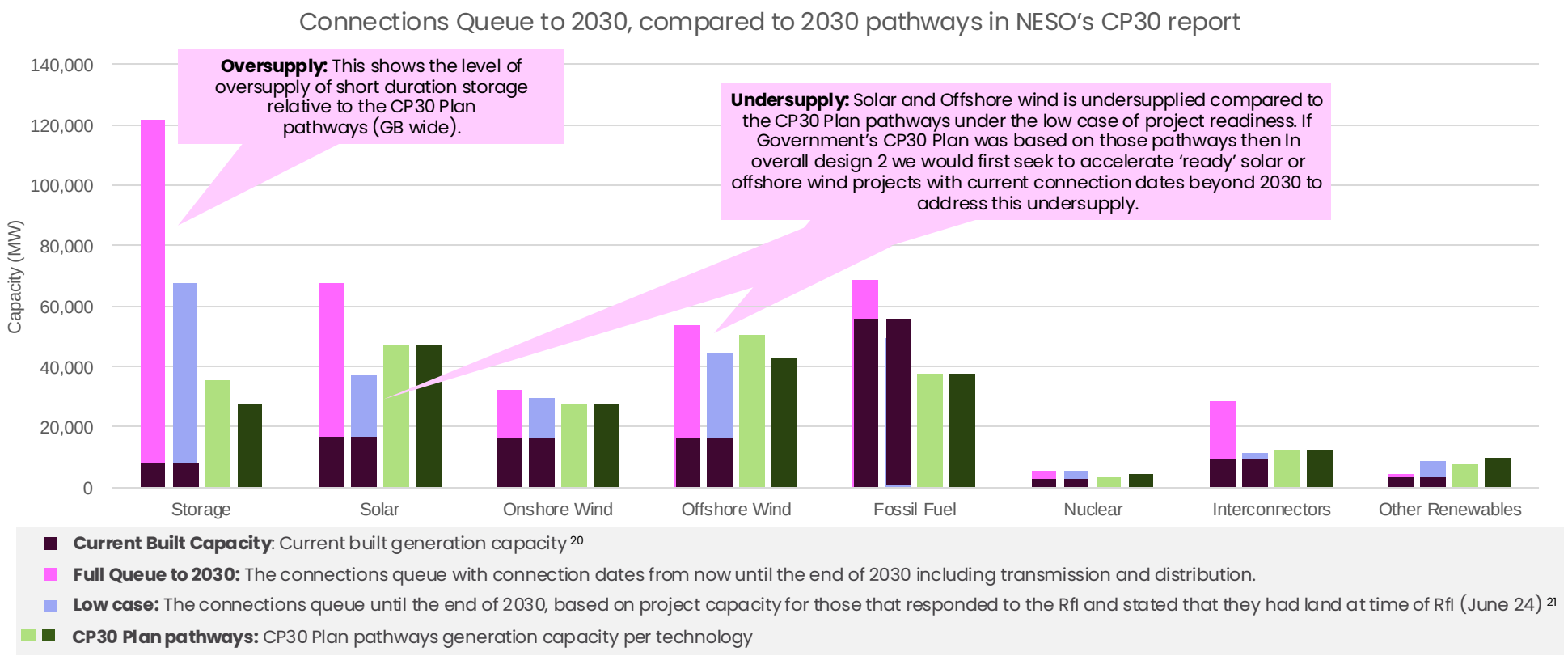
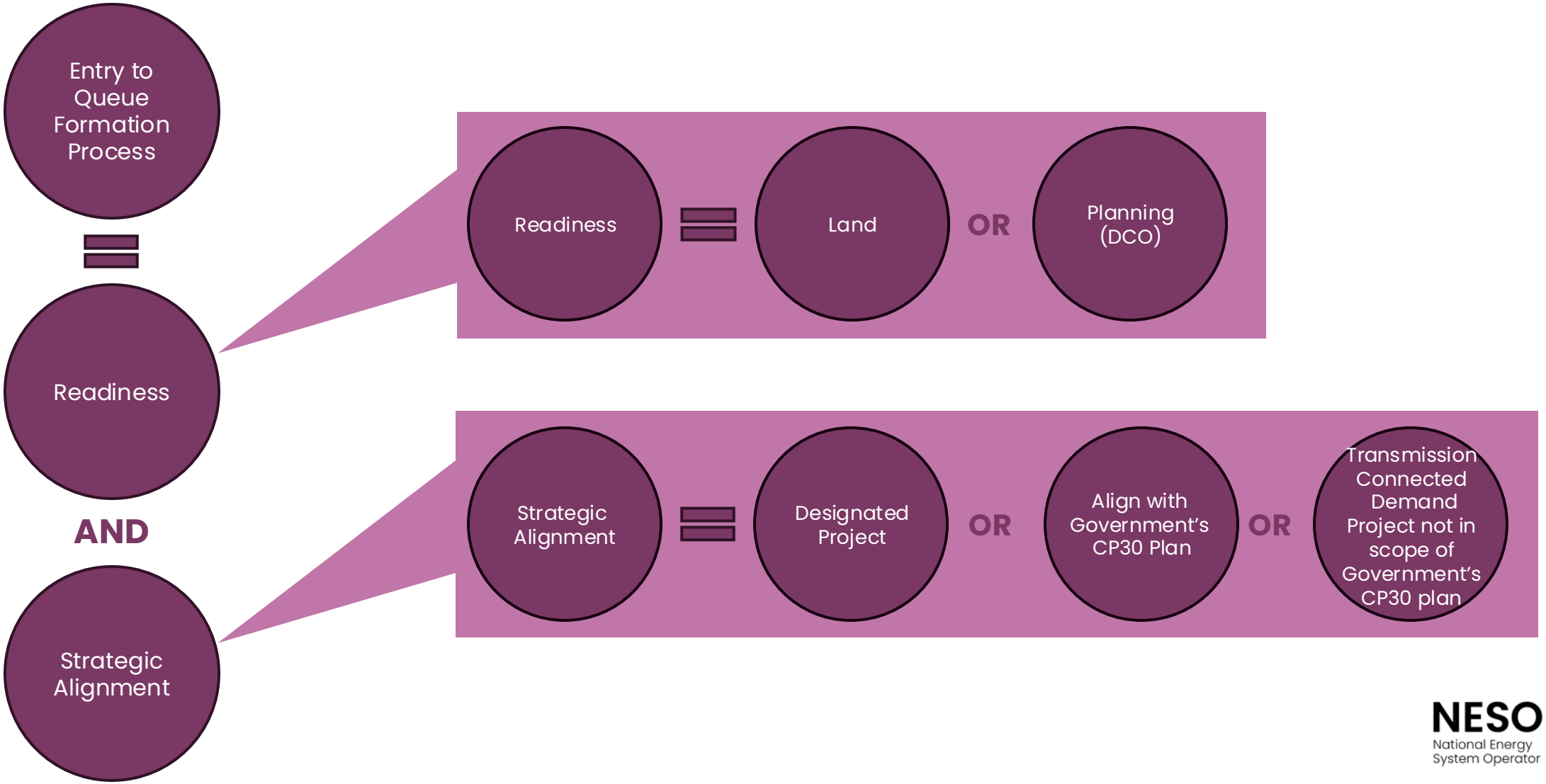
https://www.neso.energy/publications/clean-power-2030

Alignment with CP30 pathways to 2030 in our CP30 advice



https://www.neso.energy/industry-information/connections/connections-reform

Reforming the connections queue



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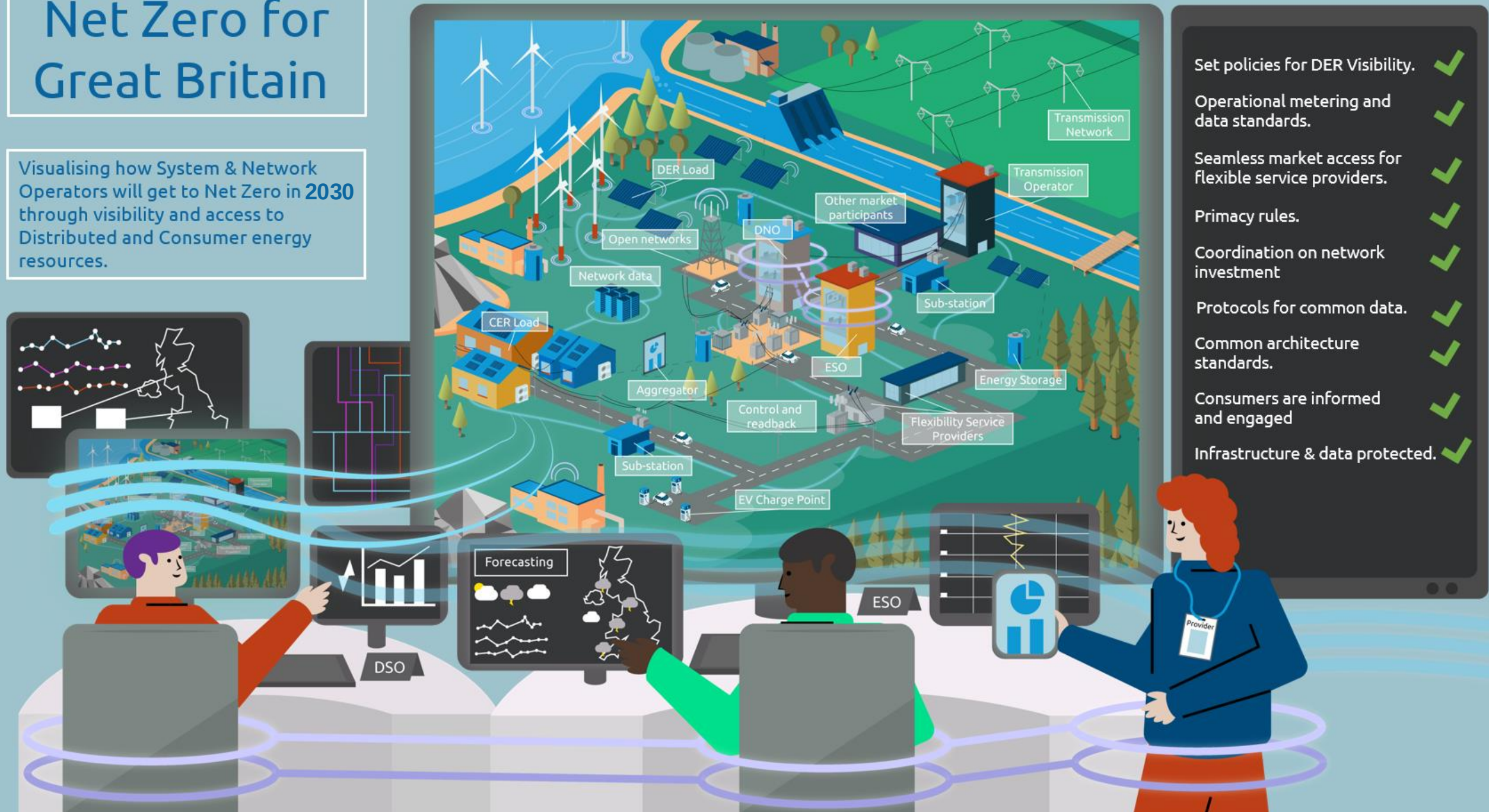
Net Zero for Great Britain

Visualising how System & Network Operators will get to Net Zero in **2030** through visibility and access to Distributed and Consumer energy resources.



- Set policies for DER Visibility. ✓
- Operational metering and data standards. ✓
- Seamless market access for flexible service providers. ✓
- Primacy rules. ✓
- Coordination on network investment ✓
- Protocols for common data. ✓
- Common architecture standards. ✓
- Consumers are informed and engaged ✓
- Infrastructure & data protected. ✓

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