Beyond 2030:

A national blueprint for a decarbonised electricity system in Great Britain

ESO

Agenda

1. Our role in the GB's energy sector
2. Beyond 2030 - A national blueprint for a decarbonised electricity system in Great Britain
3. How we got there - our approach to Network Planning

Our role in the GB’s energy sector

ESO

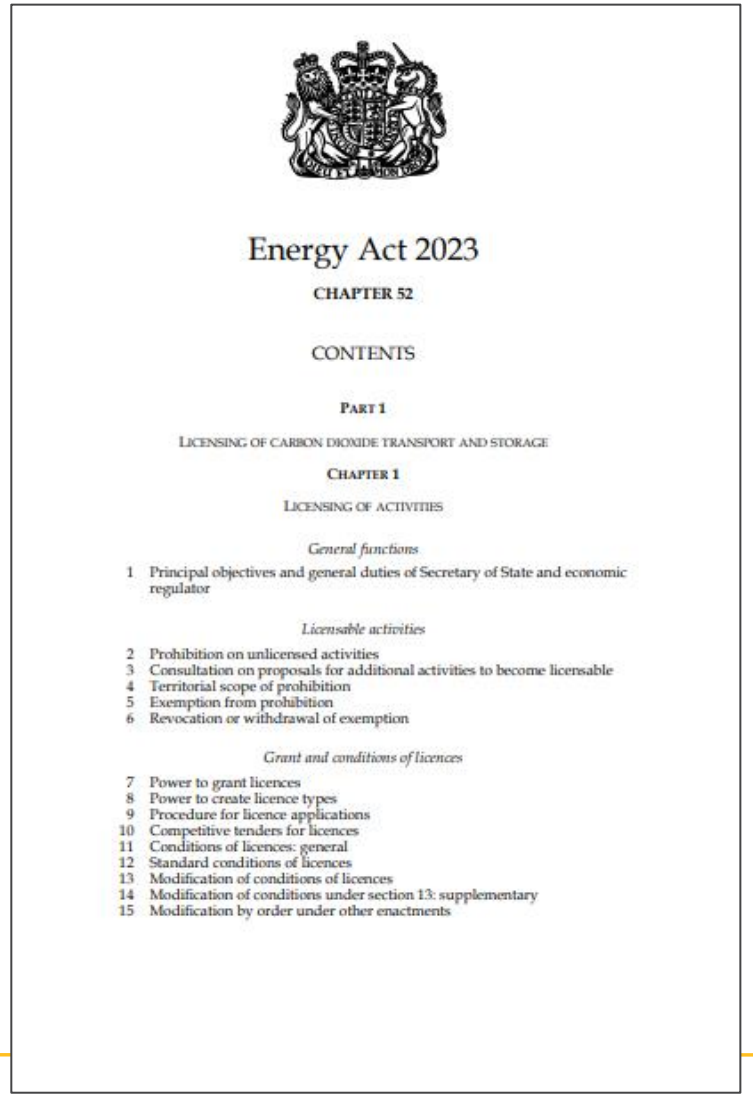
We’re currently a legally separate business within the National Grid Group.

We balance Great Britain’s electricity system to ensure that electricity is always there when it's needed.

Our mission is to enable the transformation to a sustainable energy system and ensure the delivery of reliable affordable energy for all consumers.

National Energy System Operator or **NESO**

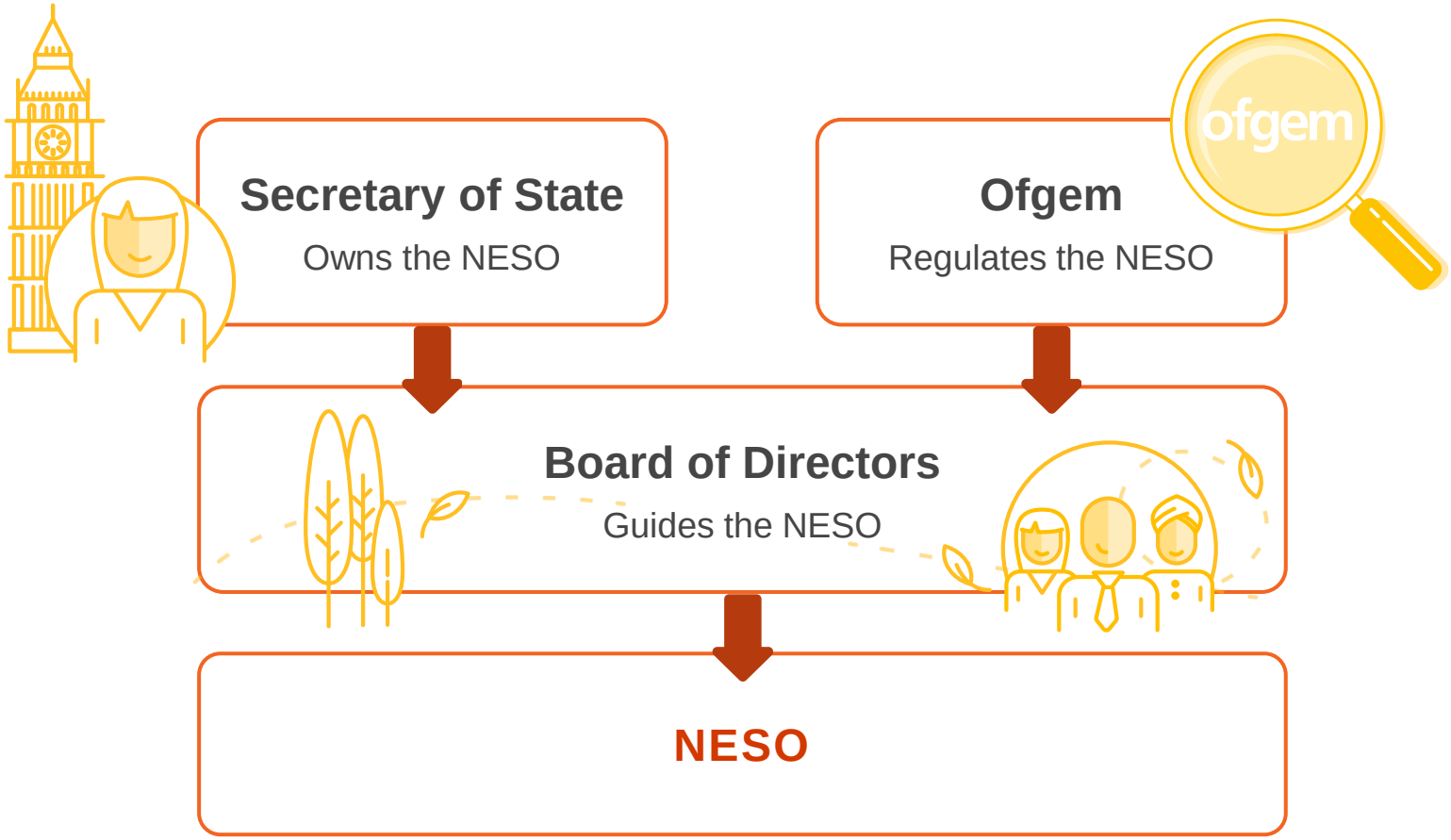
We are becoming fully independent of National Grid Plc during 2024, allowing us to undertake new roles within the energy sector.



Energy Act 2023

CHAPTER 52

CONTENTS



What Roles will the NESO undertake?

	Enduring Roles
STRATEGIC PLANNING	**Provide whole system view of the energy sector**
MARKET DEVELOPMENT	Advise on whole energy market strategy
RESILIENCE	Coordinate emergency response
SECURITY OF SUPPLY	Enable security of supply across GB's whole energy system
NET ZERO ENERGY INSIGHTS	Advisory grows into new vectors

Strategic planning

We will **coordinate system design and planning efforts across the whole energy industry** so planning and investment decisions can be optimised to deliver GB's net zero objectives at the lowest sustainable cost to consumers.

We will work with Government, Regulator and industry stakeholders to plan the decarbonisation of the energy sector

Strategic Energy Planning – Regional and national energy planning

Centralised Strategic Network Planning

Published in 2026 (revised every 3 years)

This plan maps the network that needs to be built to support 2050 net zero goals, including:

- Electricity and hydrogen systems as they are completely co-dependent
- Consideration of liquid fuels

Strategic Spatial Energy Planning

Published in 2025 (iterative plan)

Sets out what needs to be built, where, and when - to deliver on 2035 targets.

It includes electricity, hydrogen and gas:

- Coordinating supply, demand and high-level network needs
- Endorsed by Government and Ofgem
- Inputs from local planning laws

Regional Energy Strategic Planning

Published in 2026 (iterative plan)

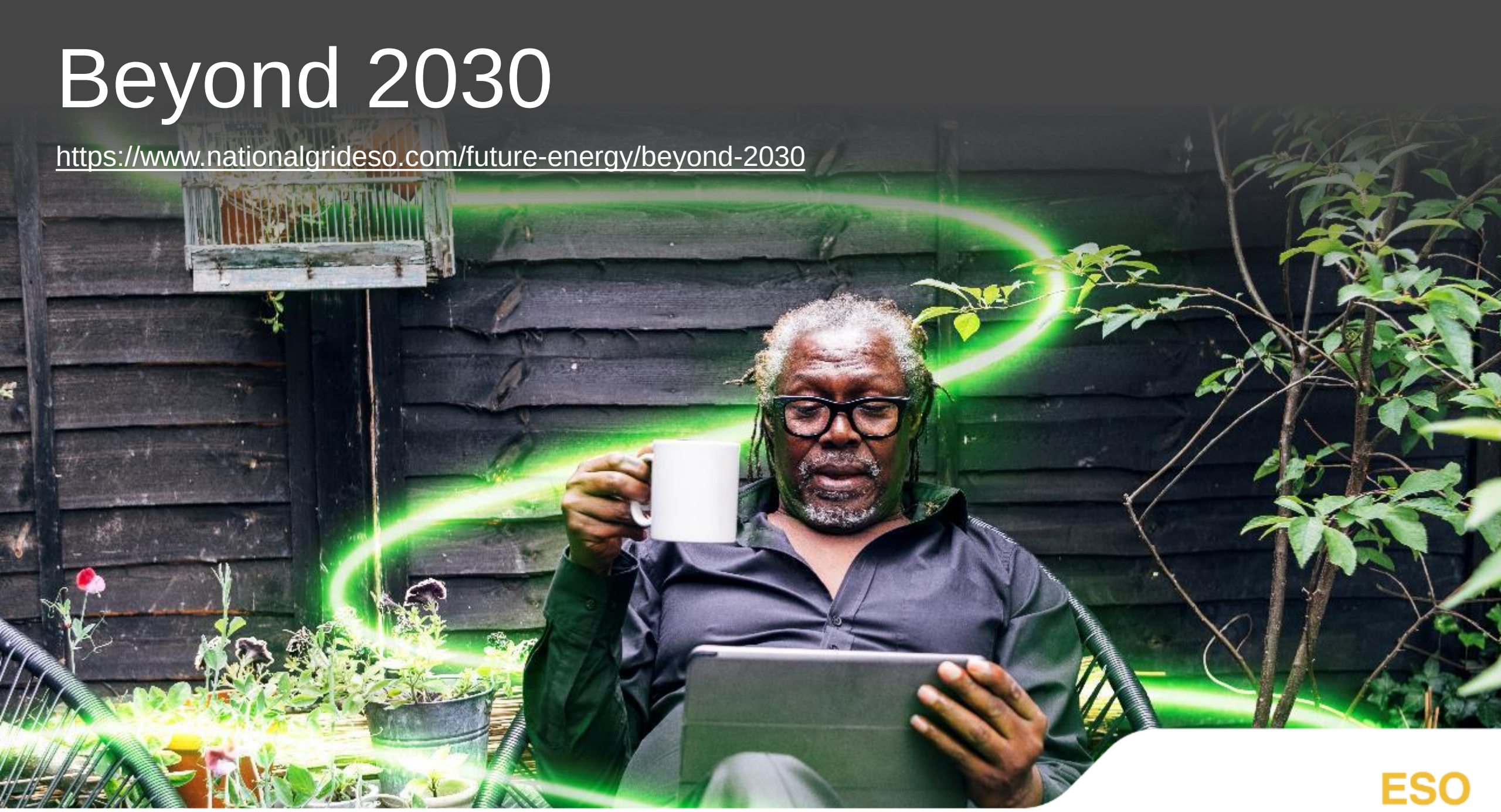
These plans inform distribution network price controls

- 10 -13 regional energy plans across all energy vectors developed with local stakeholders
- Regional plans join up local energy plans with national plans

Coordinated data and assumptions

Beyond 2030

https://www.nationalgrideso.com/future-energy/beyond-2030



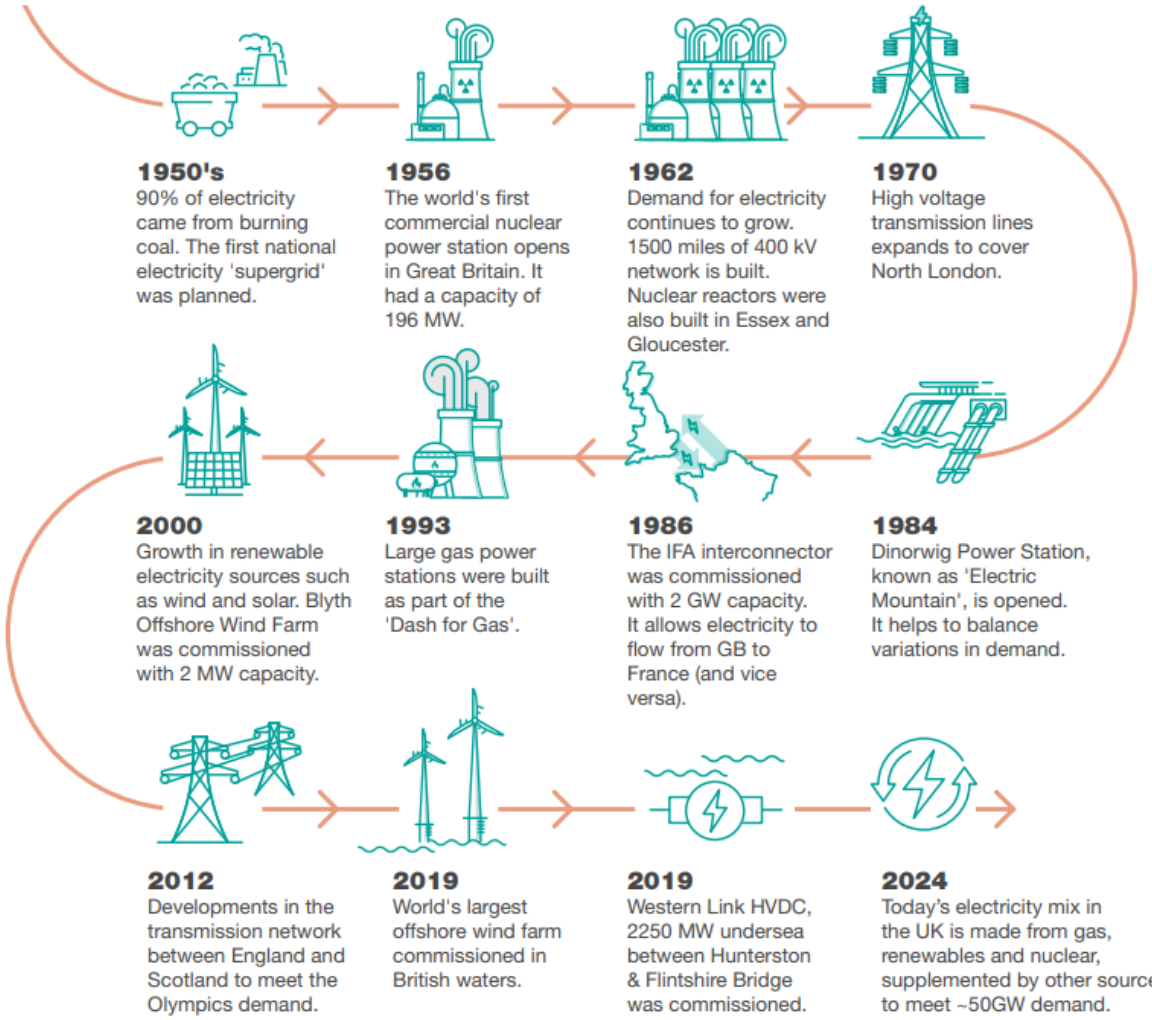
A short history of the GB transmission system

Since the ‘super grid’ was established in the 1950s, where and how electricity is generated and used has changed significantly. As a result, the transmission system needs to evolve to continue to deliver for consumers as we transition to net zero.

The transmission system we know today was designed to take generation from large power stations that were built close to coal fields, to the cities and industrial heartlands of Great Britain.

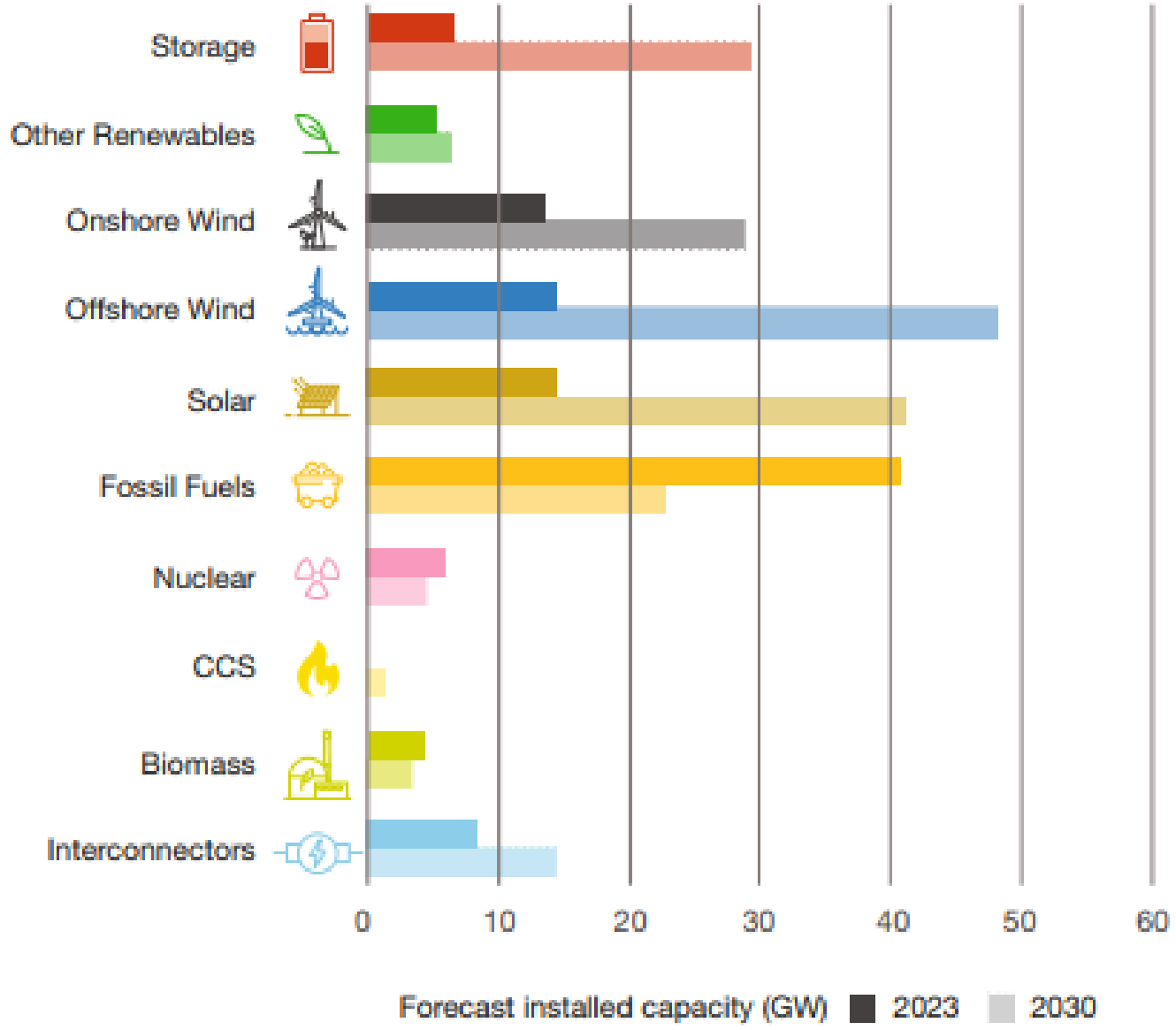
Today, we are in the process of a seismic transition towards a large and growing portfolio of renewable generation. These have been essential in reducing our reliance on fossil fuels. In the early 2000s approximately 80 per cent of the electricity consumed in Great Britain came from coal and gas, whereas in 2023, zero-carbon electricity made up more than half of the total supplied.

Great Britain’s energy history:



How we plan the network is changing

And the network is fundamentally different by the end of this decade and beyond



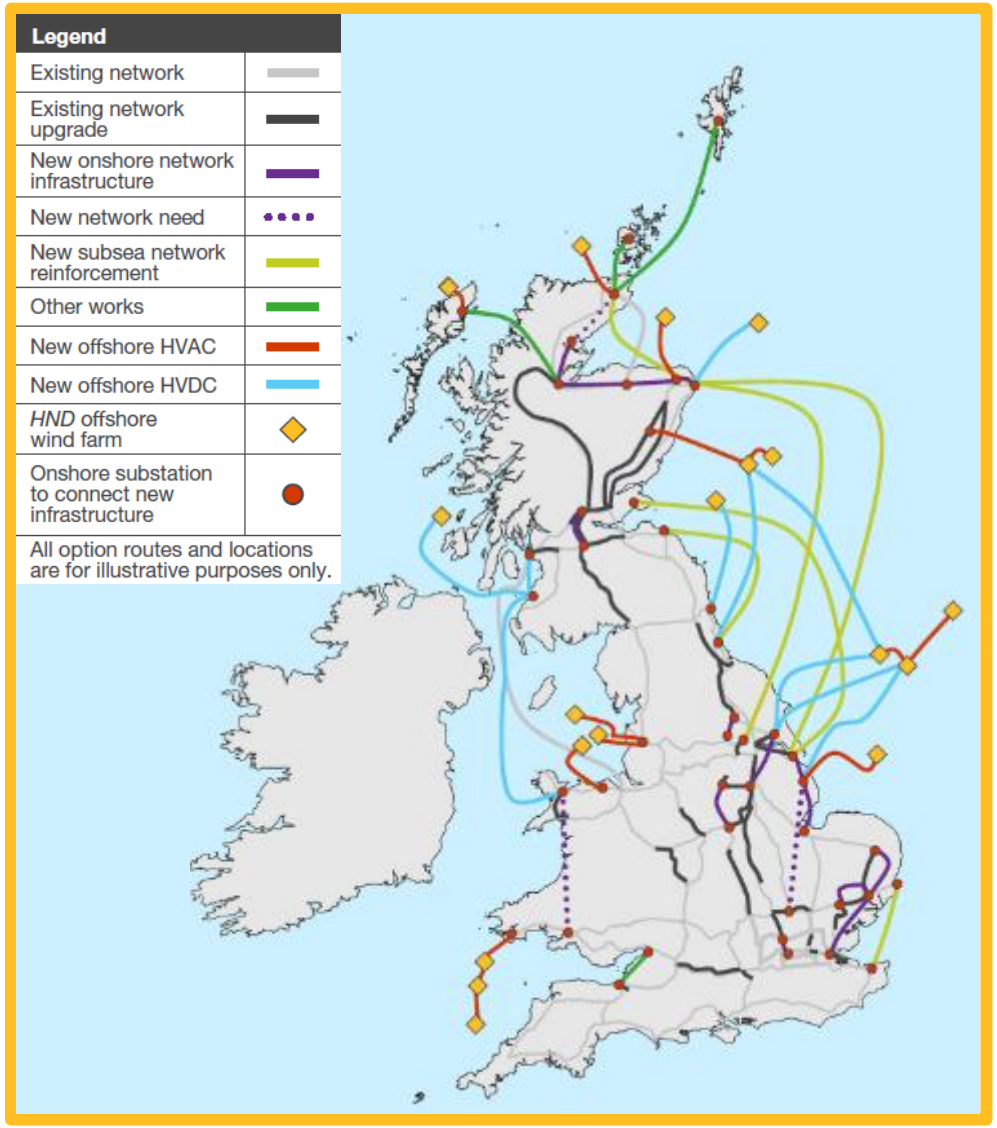
The Pathway to 2030 report

A world leading first of its kind, integrated approach for connecting 23GW of offshore wind to Great Britain reducing cabling by a third through coordination.

Proposes £54bn network investment*

Identifies and distinguishes onshore transmission projects that are required to facilitate the Government's 2030 ambitions.

Following the publication, Ofgem created Accelerate Strategic Transmission Infrastructure (ASTI) projects providing £20 Billion to accelerate schemes to meet 2030 targets.



*Costs assessed in a different price year to the Beyond 2030 report

Beyond 2030: summary of key benefits

64%
Growth in GB electricity demand between 2022 and 2035

£58 billion
Direct investment in electricity networks recommended by the ESO

Network backbone to transfer power to and for **future businesses**

21GW
of further ScotWind Offshore Wind Farms enabled

20,000
Number of jobs supported by this plan each year

£15 billion
Cumulative total added to the UK economy by the infrastructure projects proposed

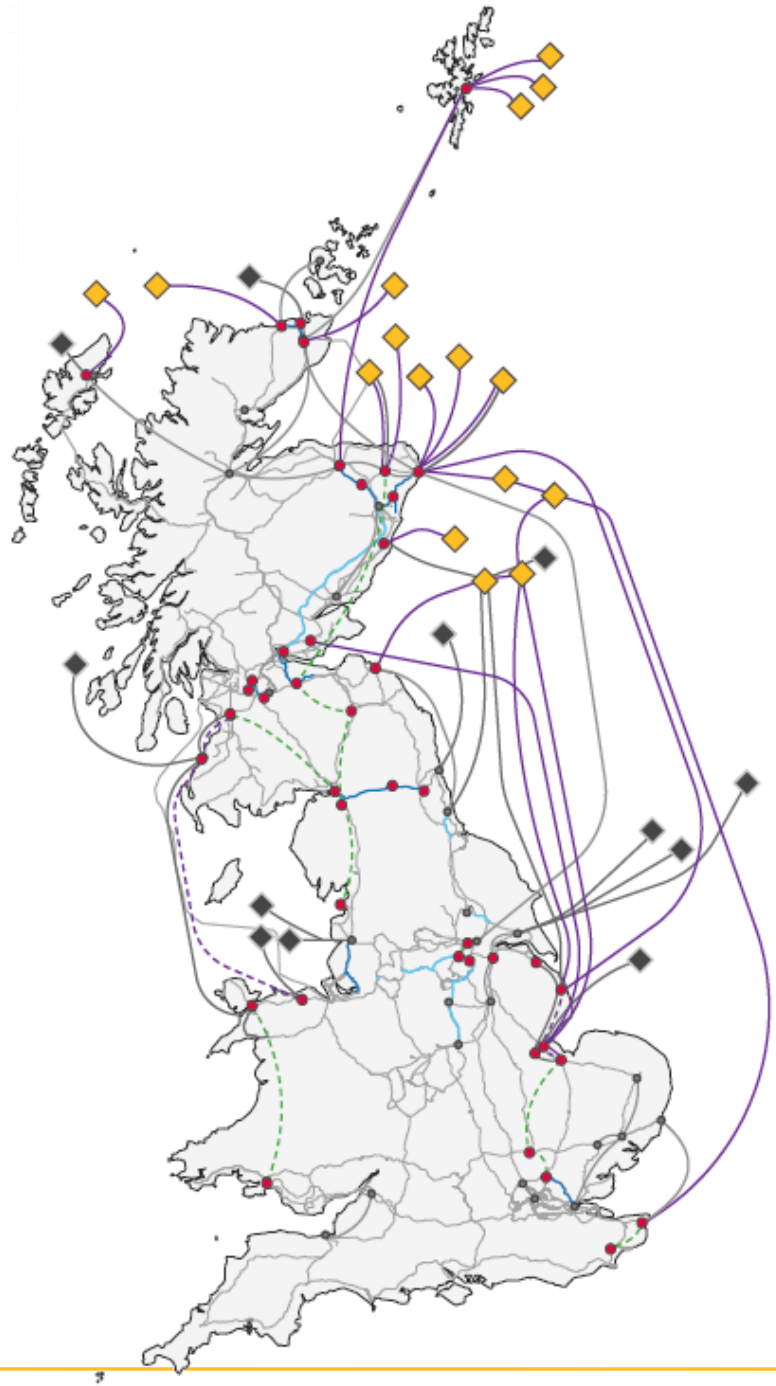
Beyond 2030: national picture

Three **offshore links on the East Coast** providing 6GW of capacity

An additional 2GW of offshore capacity on the **West Coast**

A **new onshore AC spine** from Aberdeenshire to Lancashire

Comprehensive **set of upgrades** to the existing network throughout GB



Category	Key
New offshore network infrastructure	
New onshore network infrastructure	
Voltage increase on network	
Existing network upgrade	
Substation upgrade or new substation	
Substations delivered for 2030	
In scope wind farm	
HND wind farm	
Existing Network	
Reinforcements delivered for 2030	

*Dashed lines represent low maturity options.

Note: all routes and options shown on this map are for illustrative purposes only.

Our role in network planning for GB

The network planning process at a glance

1. Scenarios

We produce and use a range of industry consulted credible futures that each decarbonise our energy system differently. These scenarios provide the starting point for our analysis.

2. Requirements

We determine the capability needs of the system across each of the scenarios identifying where future bottlenecks might occur on the system.

3. Solutions

The TOs propose potential onshore and offshore solutions to resolve network requirements. We can propose further offshore solutions as well as commercial arrangements to meet the needs of the system. All solutions vary in their level of maturity.

4. Assessment

We assess all solutions iteratively against our four design objectives considering: cost, deliverability, impact on the natural environment and impact on the local community.

5. Recommendations

We make a final set of high level network recommendations that balance the design objectives forming the design or blueprint for the future transmission system. Our scenarios allow us to make robust recommendations against a backdrop of uncertainty.

6. Detailed Design

The energy industry take forward our recommendations, developing them further carrying out a detailed design process that includes technology choices, routeing and consenting processes and extensive stakeholder engagement.

Closing remarks

Governance for GB electricity network planning

UK Central Government	Department for Energy Security & Net Zero	Sets UK energy policy
Energy regulator Office for Gas and Electricity Markets	ofgem	Regulates the UK energy sector
Electricity system Operator	ESO	Develop Great Britain's electricity network
Transmission owners	Scottish & Southern Electricity Networks TRANSMISSION; ScottishPower; nationalgrid	Design, deliver and own the transmission network – (more organisations may be involved through competition)

The Scottish Government; Llywodraeth Cymru Welsh Government	Can set devolved national policy and targets
THE CROWN ESTATE	Own and leases the seabed
renewableUK; scottish renewables	Represent offshore developers

Rate of network build

Recommendations have been made to government aiming to reduce transmission network build times from 14 to 7 years, become the **Transmission Acceleration Action Plan (TAAP)**

Our plans combined with this emerging policy can provide a yearly pipeline of billions of £s of opportunity throughout the late 2020's and 2030's.

The need for a **Strategic Plan**

Clear design standards

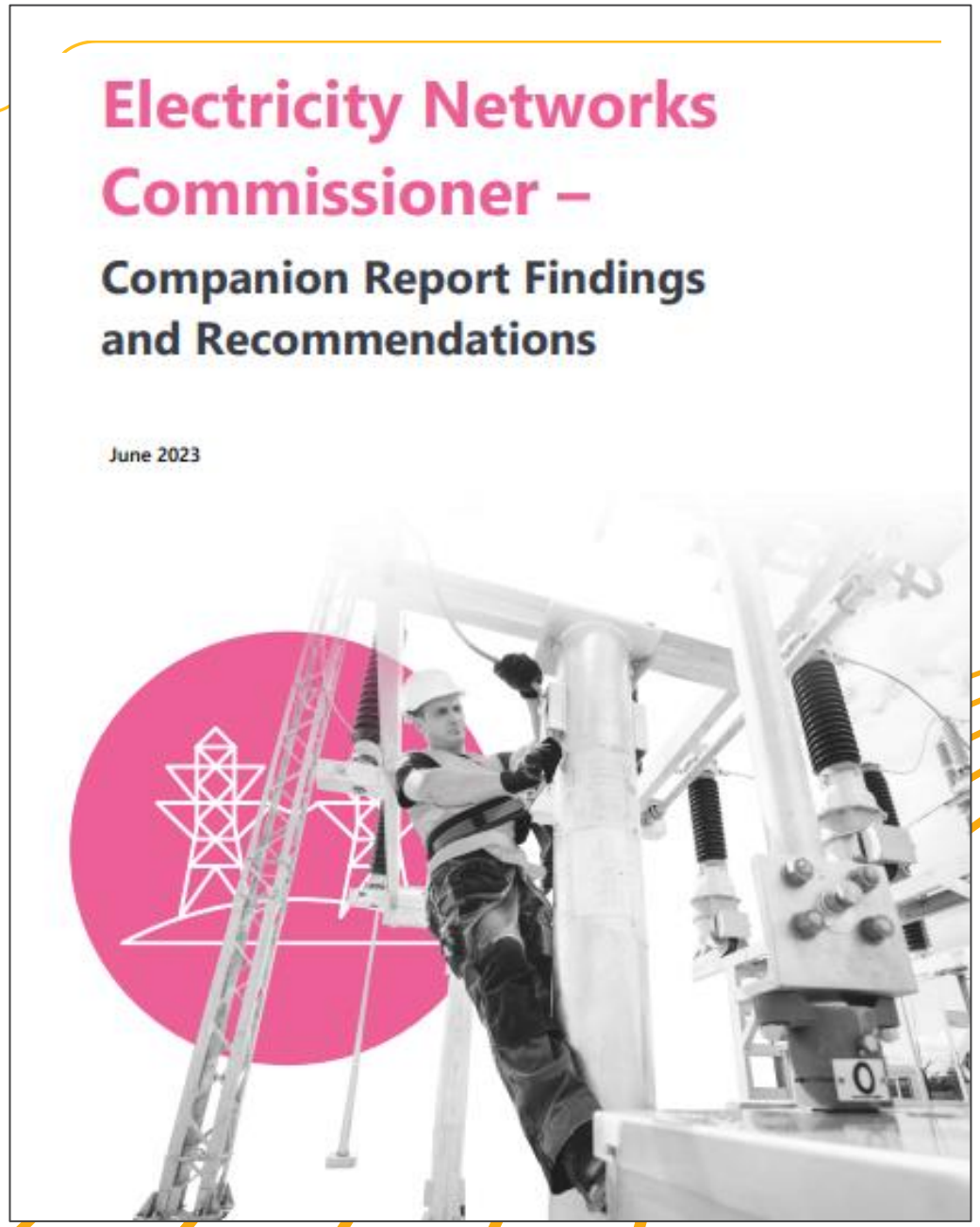
Change the **regulatory approvals**

Speed up **planning approval**

Growing need for **people and skills**

Increase demand on the **supply chain**

Key themes from the Winser Report



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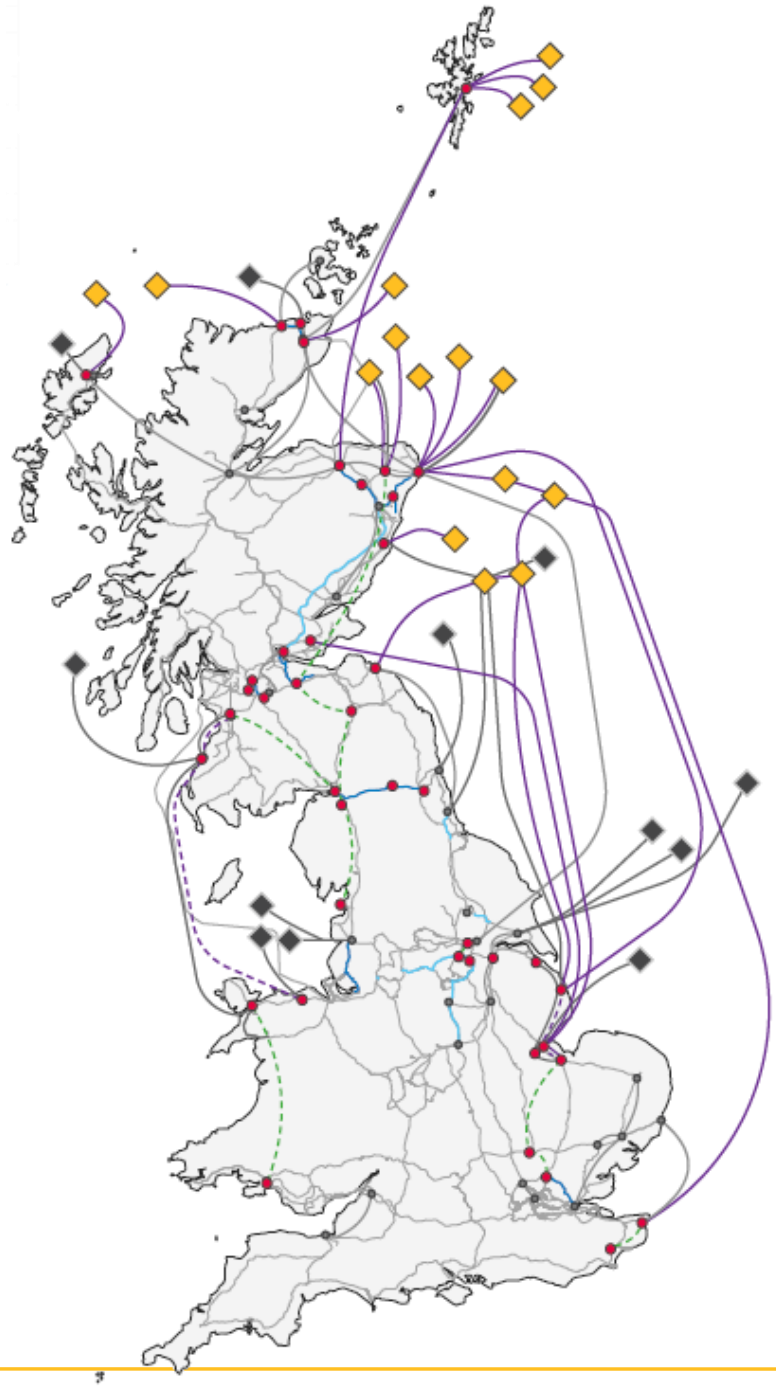

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Q&A