

Everything everywhere all at once

Clean power 2030 and devolved government (and
Scotland's forthcoming climate targets)

Dave Hawkey

SPREEE 14 Jan 2025

EVERYTHING EVERYWHERE, ALL AT ONCE

THE NEED FOR A FOUR
NATIONS APPROACH
TO ACCELERATE WIND
DEPLOYMENT IN THE UK

**Joshua Emden and
David Hawkey**

December 2024

**5 MISSIONS FOR
A BETTER BRITAIN**



MAKE BRITAIN A CLEAN ENERGY SUPERPOWER

*TO CUT BILLS, CREATE JOBS AND DELIVER SECURITY
WITH CHEAPER, ZERO-CARBON ELECTRICITY
BY 2030, ACCELERATING TO NET ZERO*



 **Labour**

17552_23 Reproduced from electronic media. Promoted by David Evans
on behalf of the Labour Party, both at 20 Rushworth Street, London, SE1 0SS.

**IP
PR** Scotland

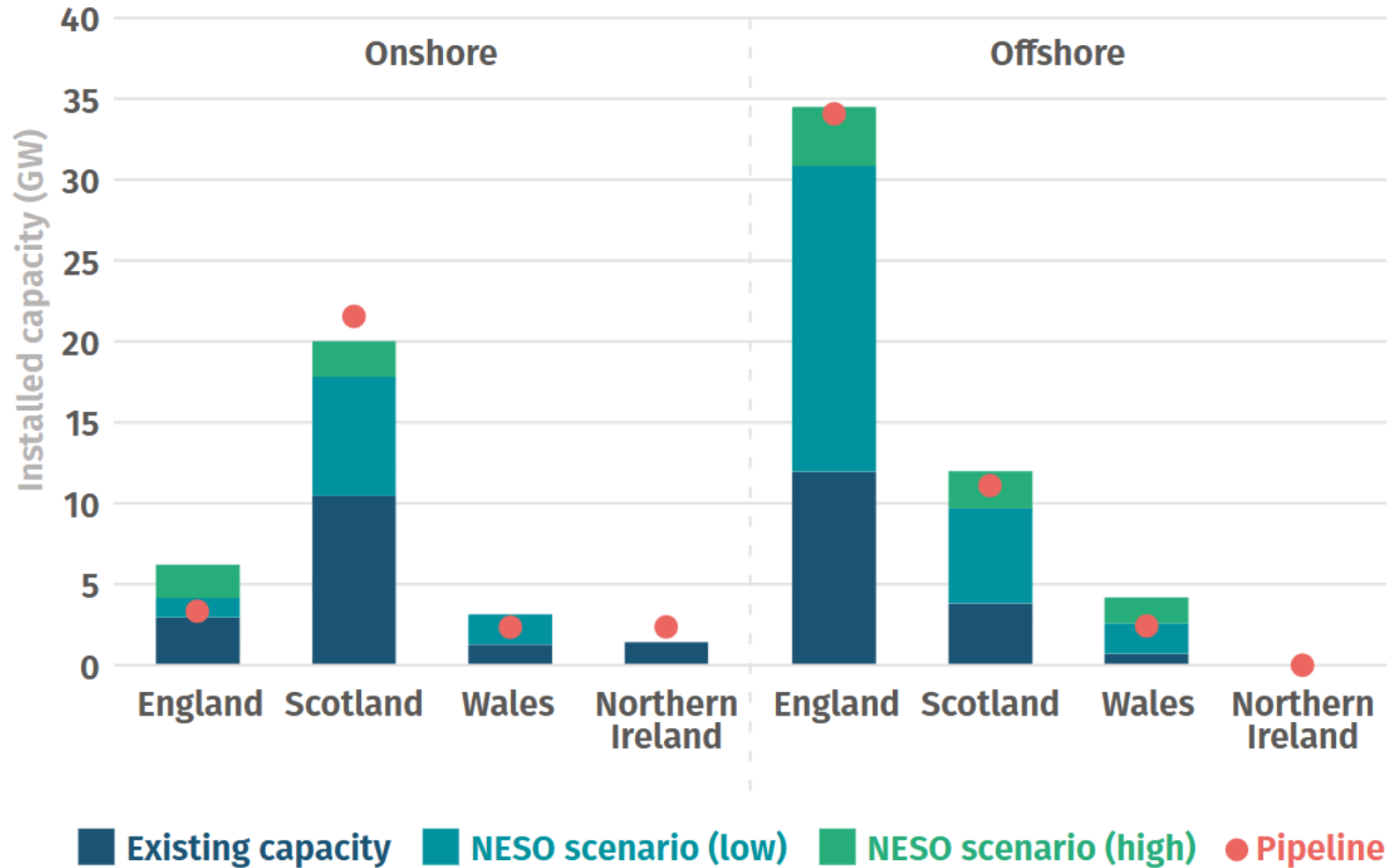
Coordination, coordination, coordination

1

Clean power is a huge challenge but is achievable for Great Britain by 2030.

- It is possible to build, connect and operate a clean power system for Great Britain by 2030, while maintaining security of supply.
- Several elements must deliver at the limit of what is feasible: a key challenge will be making sure all deliver simultaneously, in full and at maximum pace, in a way that does not overheat supply chains, is sustainable and sets Great Britain on the right path beyond 2030.

What? Where?



Source: Authors' analysis of NESO 2024 and RenewableUK 2024b

Note: 'Pipeline' estimate does not account for potential project attrition.

Different stages of a wind project for each UK nation

Stage of wind project	Scotland	Wales	Northern Ireland	England
Leasing (offshore wind only)	Led by Crown Estate Scotland; also requires developers to have a 'Supply Chain Development Statement' in place.	Leasing through The Crown Estate.	In 2023, the Department for the Economy and The Crown Estate published a statement of intent to commit to leasing in the future.	Leasing through The Crown Estate.
Development	Developers require confidence in the long-term pipeline of CfDs and the availability of local infrastructure (eg grid connections, port infrastructure and supply chains). Most of these considerations will require close collaboration with the devolved administrations.			
Consenting	<p>Local planning authorities manage projects under 50 megawatts (MW).</p> <p>The Scottish government's Energy Consents Unit handles projects over 50MW.</p> <p>Planning guidelines recognise the need for renewables and place weight on their contribution to climate and energy targets.</p>	<p>Local planning authorities handle onshore wind projects under 10MW (and soon under 50MW).</p> <p>Welsh ministers must approve projects above this threshold.</p> <p>For offshore wind, projects between 1MW and 350MW require Welsh government approval, over which consenting sits with the UK government and the secretary of state for energy security and net zero.</p> <p>For onshore wind, presumption is in favour of pre-assessed areas for wind development.</p>	<p>Projects under 30MW require approval from local planning authorities.</p> <p>Projects over 30MW require approval from the Northern Irish department for infrastructure.</p> <p>Onshore wind farms are only permitted if there is no "unacceptable impact".</p>	<p>Offshore projects require secretary of state approval through the Nationally Significant Infrastructure Project (NSIP) regime.</p> <p>Onshore wind projects currently need planning permission from the local planning authority regardless of size, although the government has recently committed to consulting on bringing large onshore wind projects into the NSIP regime.</p>
CfD auction	Arranged and administrated by the UK government.		<p>Energy policy is fully devolved (apart from nuclear energy) but must consider impact on the UK electricity market.</p> <p>Northern Ireland does not currently have any CfD support for its renewable energy projects, although it is currently consulting over the development of one.</p>	Arranged and administered by the UK government.

**Shared challenges,
powers with devolved
administrations**



**Shared challenges,
powers with
UK government**



**Nation-specific
challenges, powers
with devolved
administrations**

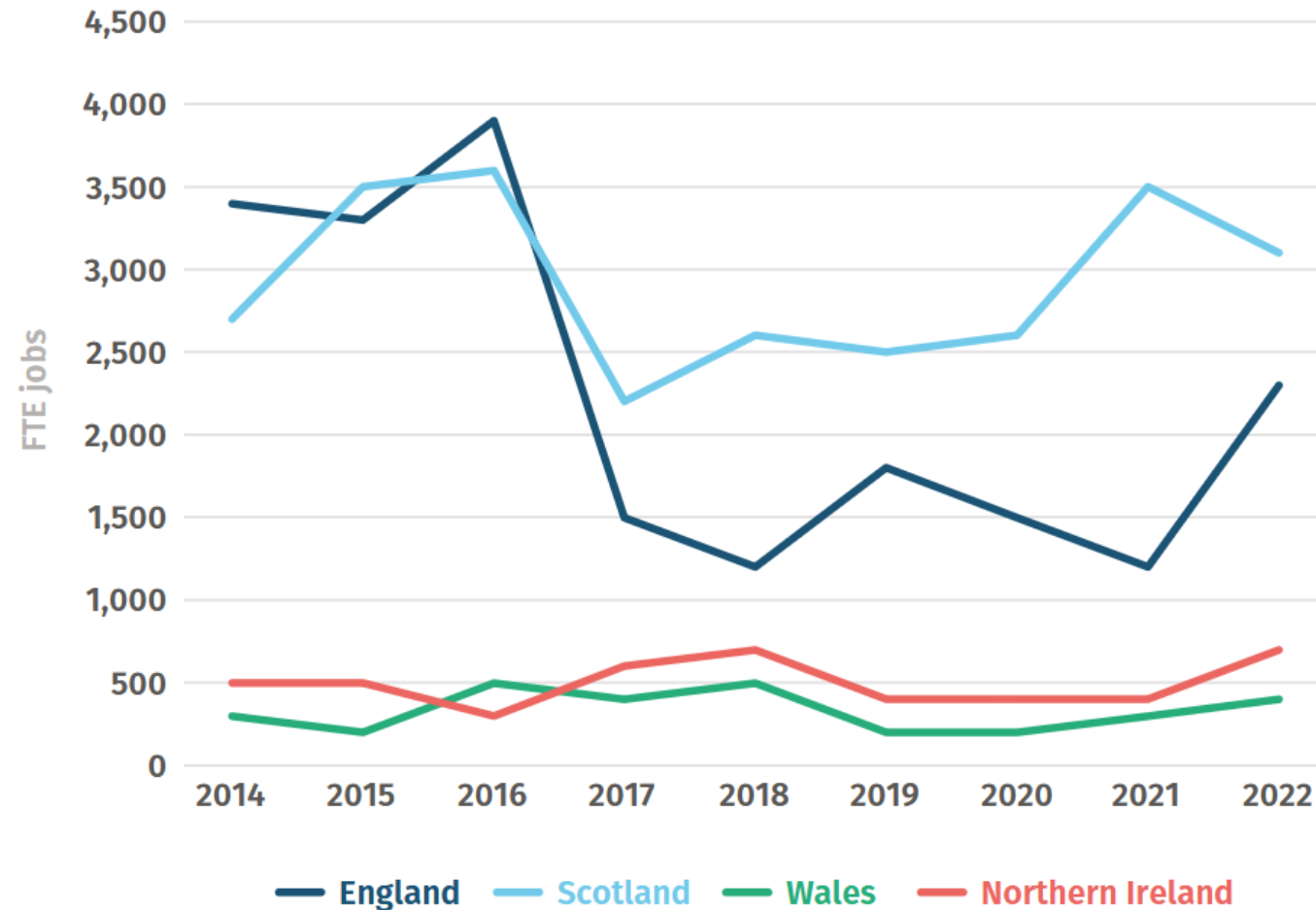


**Nation-specific
challenges, powers
with UK government**



Interdependence

The withdrawal of subsidies for onshore wind across the UK damaged the industry



Source: ONS 2024

Spatial planning policy

- NPF4
 - “probably...one of the most supportive planning regimes for renewables in the whole of Europe”
- Sectoral marine planning for offshore wind
- Ongoing challenges
 - Capacity within the planning system
 - Delays in frameworks and plans

Industrial strategies

- Industrial strategy is about building an ecosystem
 - Mobilising coinvestment and other complementary actions (e.g. training choices)
- Scottish actions to coordinate demand
 - Strategic Investment Model
 - Supply Chain Development Strategies of CES leaseholders
- Financial firepower
 - SG aspiration to invest of “up to” £500m in offshore wind supply chains over 5 years
- Workforce and skills planning

Coordination across UK and devolved governments

- Complexity, detail, emergence
- Early signs of good collaboration across UK and devolved government
 - GB Energy to work with Scottish public bodies
 - Reserved powers to update transmission network consenting in Scotland
 - Joint commissioning of Strategic Spatial Energy Plan
 - Productive working relationships across governments

Recommendations

- Joint commitments to the joint challenge of transforming the energy systems across the UK
- Ensure a four nations approach – early sight, coordination and funding
- Transparent monitoring of progress to clean power, building accountability for actions and outcomes
- Defined roles for devolved government in rapidly evolving institutional landscape

Mission driven climate policy

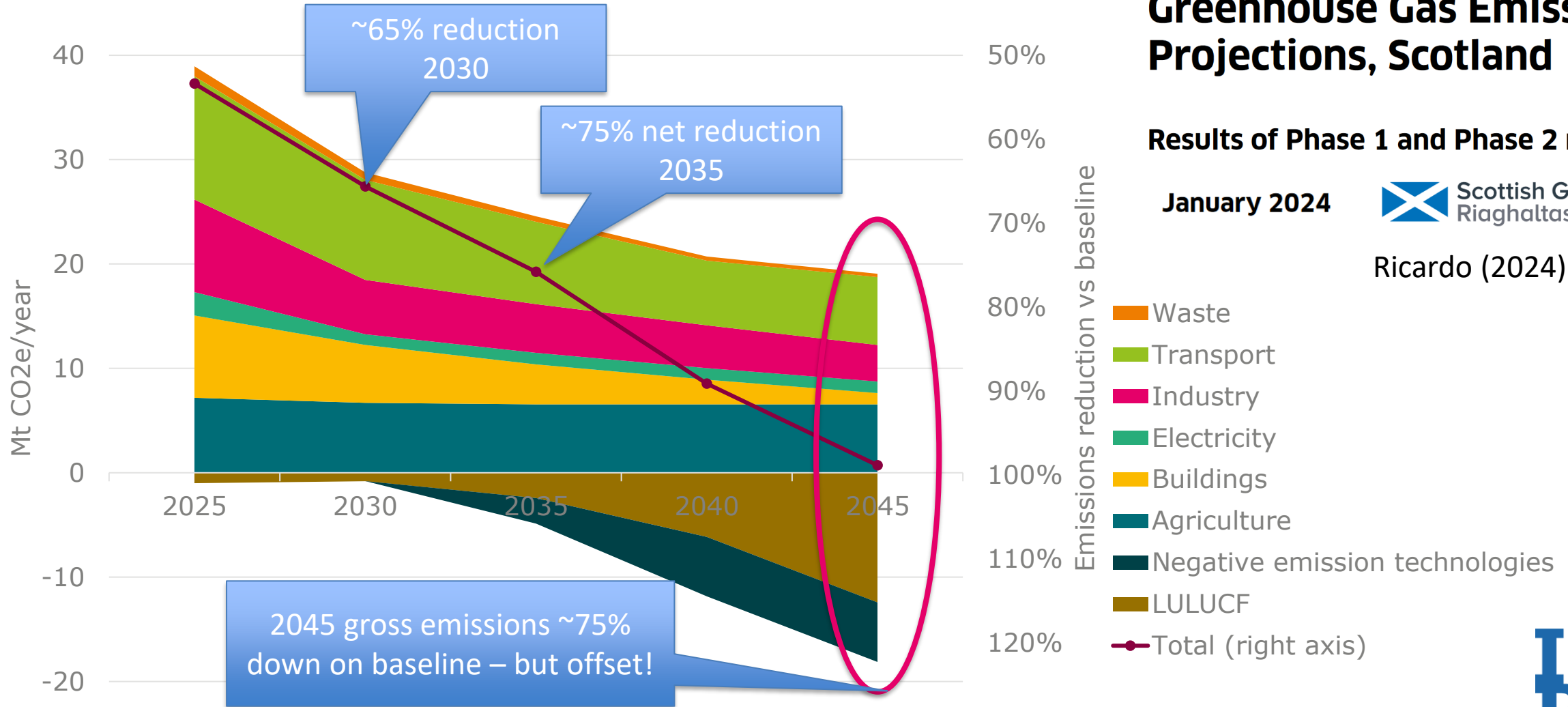
Greenhouse Gas Emissions Projections, Scotland

Results of Phase 1 and Phase 2 modelling

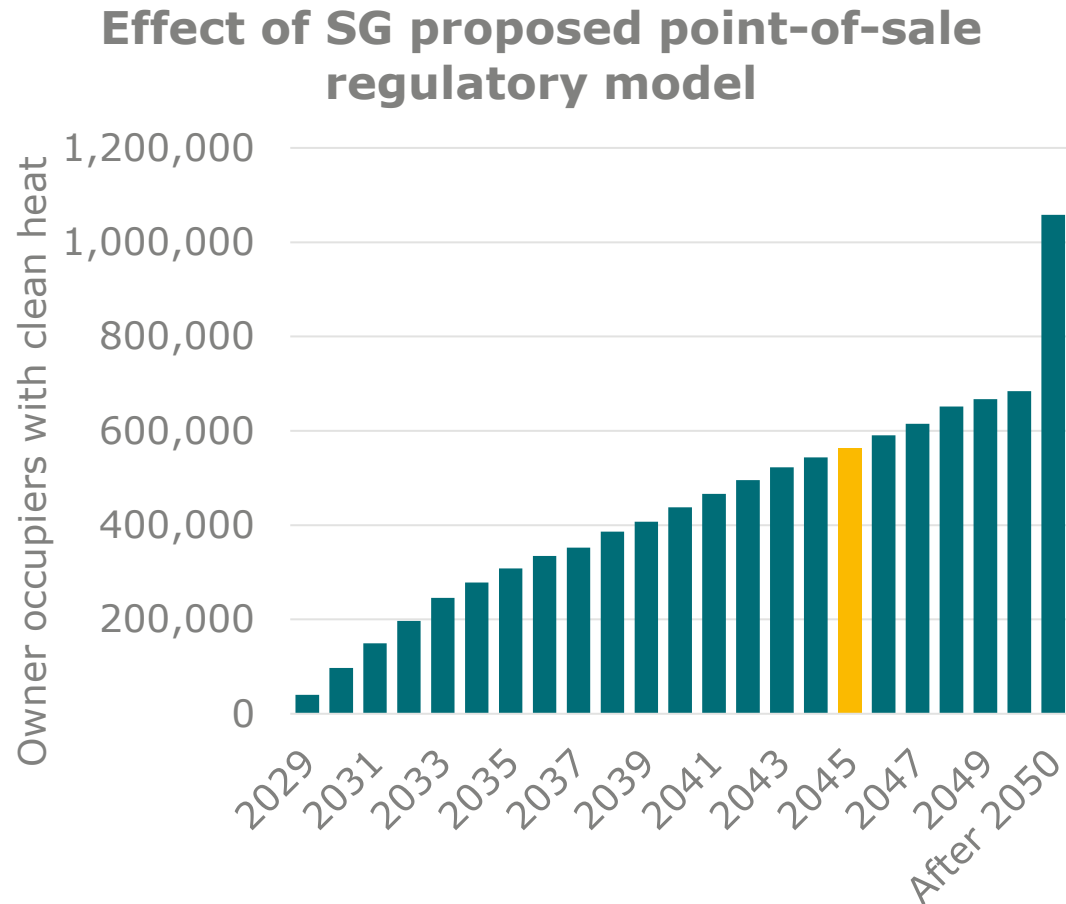
January 2024



Ricardo (2024) modelling



Time is running short



Source: analysis of Scottish House Condition Survey

- The remaining sectors are *complicated* to decarbonise
 - Coordinated change
 - Planning
 - Infrastructure
 - Winners and losers
 - Daily life
- Delay increases costs
- Balance between flexibility and uncertainty

Net zero missions

- Set clear and meaningful sectoral milestones
- Build a coherent and credible plan for reaching those milestones
 - Have a robust “plan A” in light of uncertainties
- Roles, responsibilities and commitments within the plan
- Bring the hardest piece of the jigsaw into the centre

Thanks

- d.hawkey@ippr.org
- <https://www.ippr.org/articles/everything-everywhere-all-at-once>

Clean Power 2030

*National Energy System Operator
and CP30 advice to UK Government*

SPREE, 14 January 2025

Rita Wadey, Head of Energy Policy – NESO

The National Energy System Operator

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.

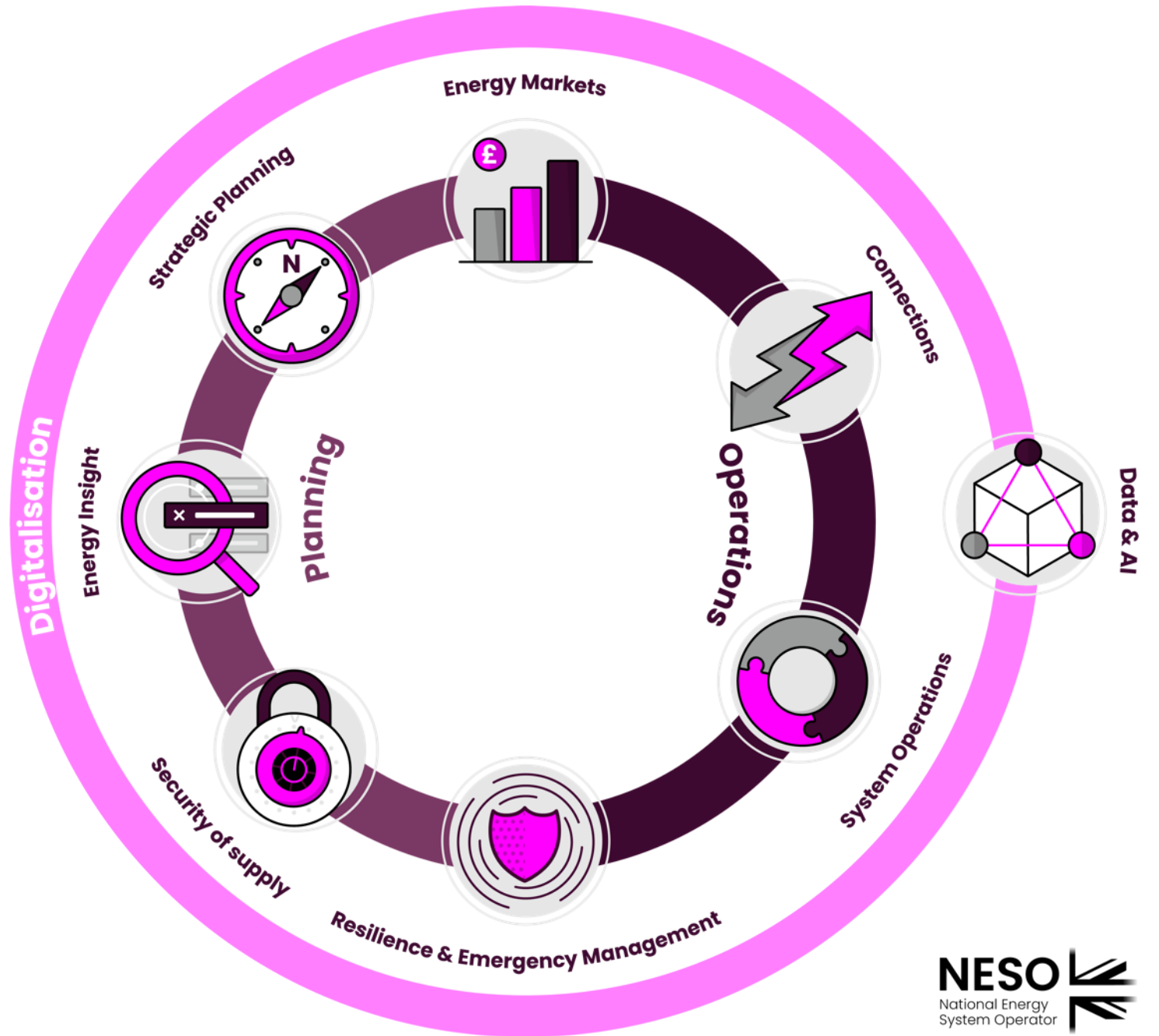


Facilitating Innovation
Creating an environment that enables others to help solve energy challenges.

What We Do

We bring together eight activities required to deliver the plans, markets and operations of the energy system of today and the future.

Bringing these activities together in one organisation encourages holistic thinking on the most cost-efficient and sustainable solutions to the needs of our customers.



NESO in Scotland

- GB wide mandate, we are working to bring the benefits of the energy transition to every part of Scotland, England and Wales.
- We launched in Scotland with MSPs and other Scottish energy stakeholders in Edinburgh last October
- NESO office in Glasgow – growing team of engineers and experts working from Scotland and with Scottish energy stakeholders.
- NESO Scottish public affairs function to support MSPs on NESO's role plus advice and access to energy system experts.
- We have been co-commissioned with the Scottish, Welsh and UK governments to create first Strategic Spatial Energy Plan for GB as a whole – and to develop Regional Energy Strategic Plans, including for Scotland.

Great Britain's Power Decarbonisation Journey

The largest driver of the long-term fall in Great Britain's emissions has been the decarbonisation of our electricity supply, due to the shift away from coal for power generation to natural gas and renewables.

NESO has a goal of operating a secure net zero electricity system for short periods by 2025, provided that the market offers a safe and operable energy mix.

2023 was Great Britain's electricity system's greenest year on record, with average carbon intensity at 149gCO₂/kWh.

September 2024 saw GB, become the first G7 country to phase-out coal power.

In 2000, around

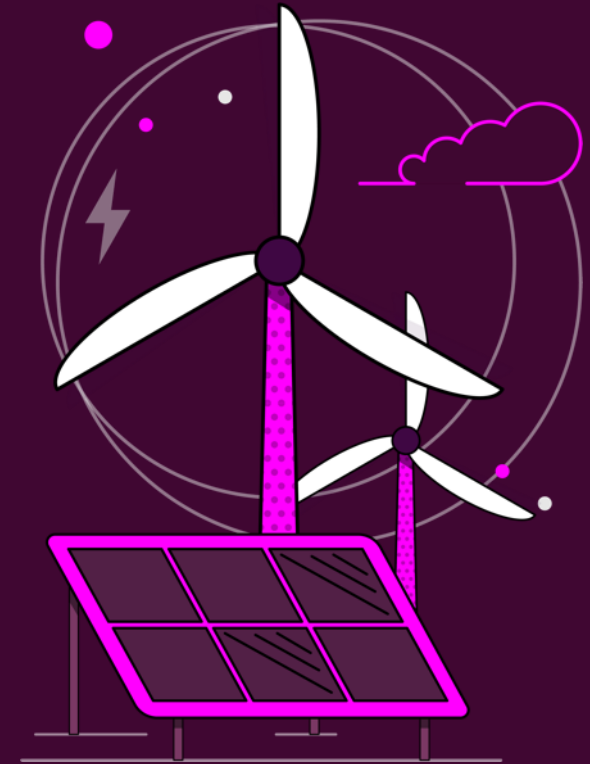
3%

of electricity generation came from renewable sources, such as wind and solar.

In 2023, around

40%

of electricity generation came from renewable sources.



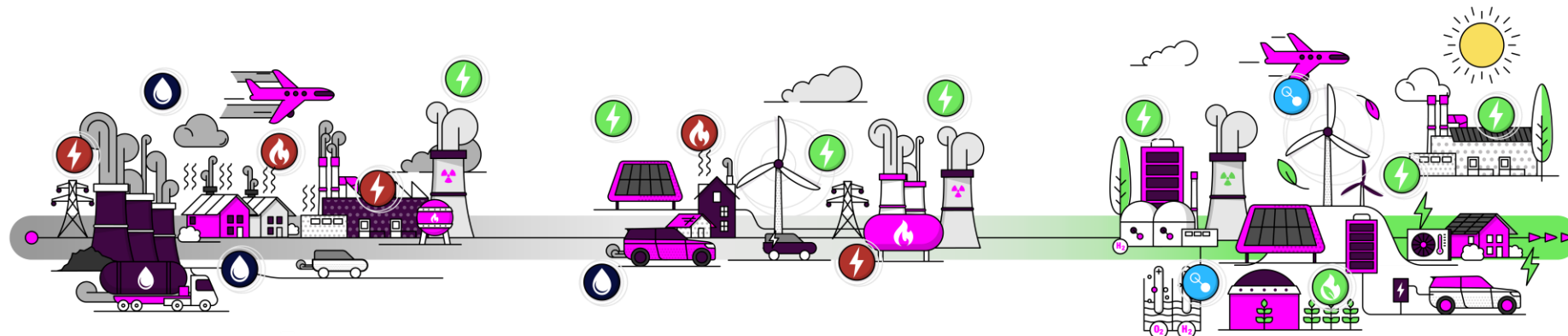
Clean Power 2030 – NESO advice to Government

HM Government has an ambition for Britain to be supplied with clean power by 2030.

HM Government has made this one of five missions for Government. Mission Control, led by Chris Stark, will oversee the delivery of a clean power 2030 plan, consistent with 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 considered that advice in developing its Clean Power Action Plan published in December.



Public

How NESO approached CP30 analysis

Describing clean power

How NESO described clean power

GB produces at least as much clean power as our total annual electricity demand. Unabated fossil fuel generation is reduced to the minimum required to keep the system secure, considering the availability and deliverability of alternatives. For 2030, we expect this to be less than 5% of total power generation in a typical year.

NESO – Clean Power in numbers

	Share of GB clean power produced to GB consumption ¹	Share of unabated fossil generation ²	Carbon Intensity ³
Today	~60%	33%	~150 gCO ₂ e
Clean Power 2030	≥100%	<5%	< 20 gCO ₂ e

¹ Annual TWh domestic clean power production over total electricity consumed by GB homes and businesses

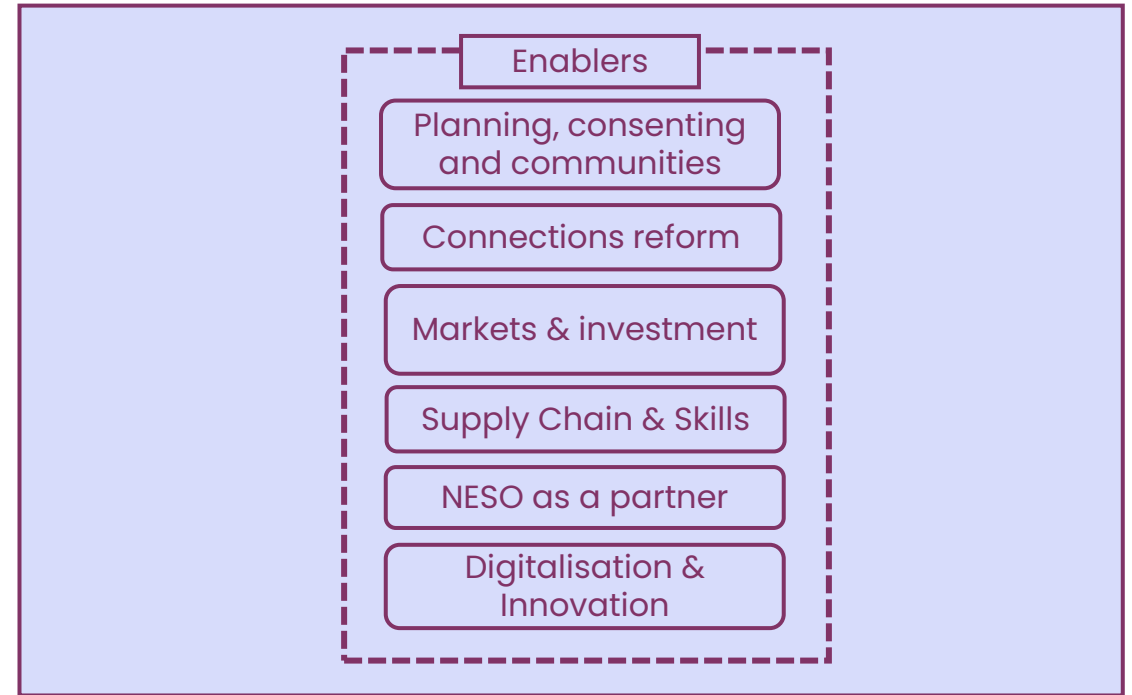
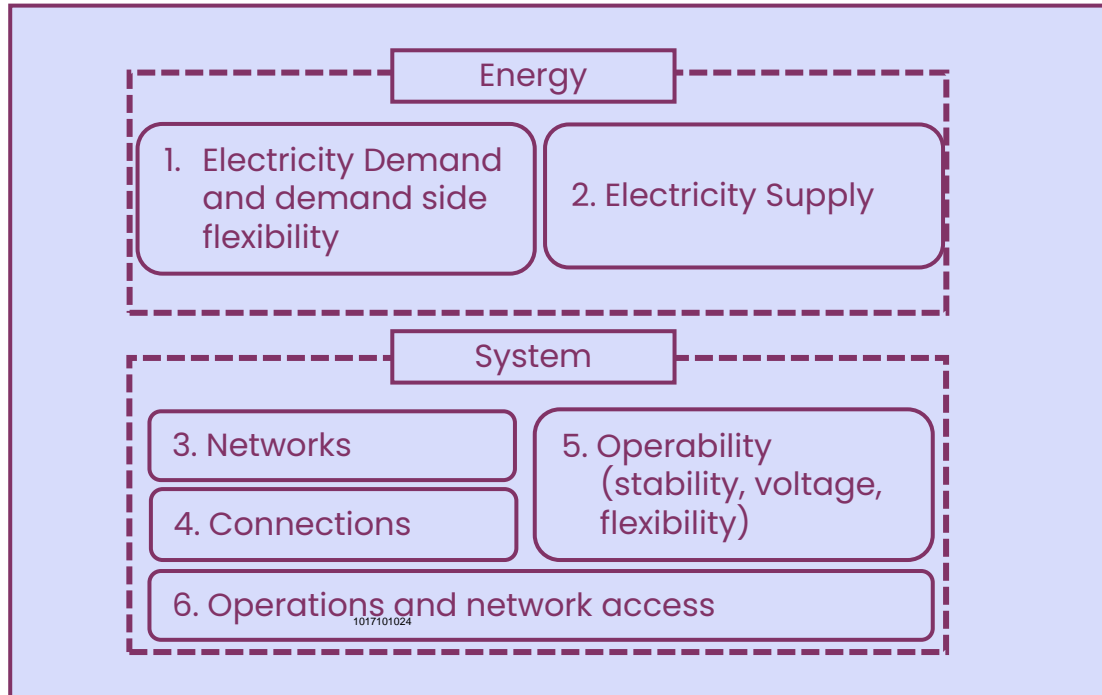
² Unabated fossil generation as a proportion of total electricity generation excluding exports

³ Carbon emitted from GB electricity production (gross, excl combined heat and power, and energy from waste)

DESNZ Clean Power Action Plan

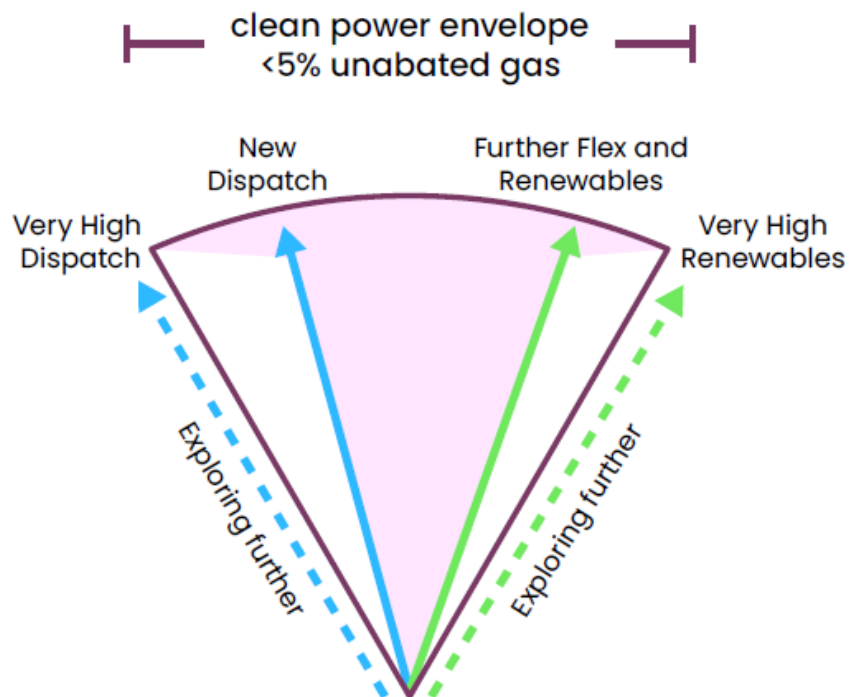
Defining the Clean Power target
Clean Power means that by 2030, Great Britain will generate enough clean power to meet our total annual electricity demand, backed up by unabated gas supply to be used only when essential

Different components of NESO's clean power analysis



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

Pathways to clean power



All pathways see increased electrification of transport, heat and industry by 2030 as needed to meet economy-wide carbon targets. Energy efficiency improvements continue across both pathways. Clean power pathways will all require increased digitalisation, open data and Innovation.

Further sensitivities: batteries, carbon price, nuclear and weather years

New Dispatch

- Growth in renewables but at a lower level compared to Further Flex and Renewables.
- Deployment of new low carbon dispatchable power (CCS and hydrogen) alongside highest nuclear capacity.

Further Flex and Renewables

- Highest levels of societal engagement, with higher residential and industrial demand flexibility and more storage.
- Fast deployment of renewables (50 GW offshore wind), but no new dispatchable power.

Public

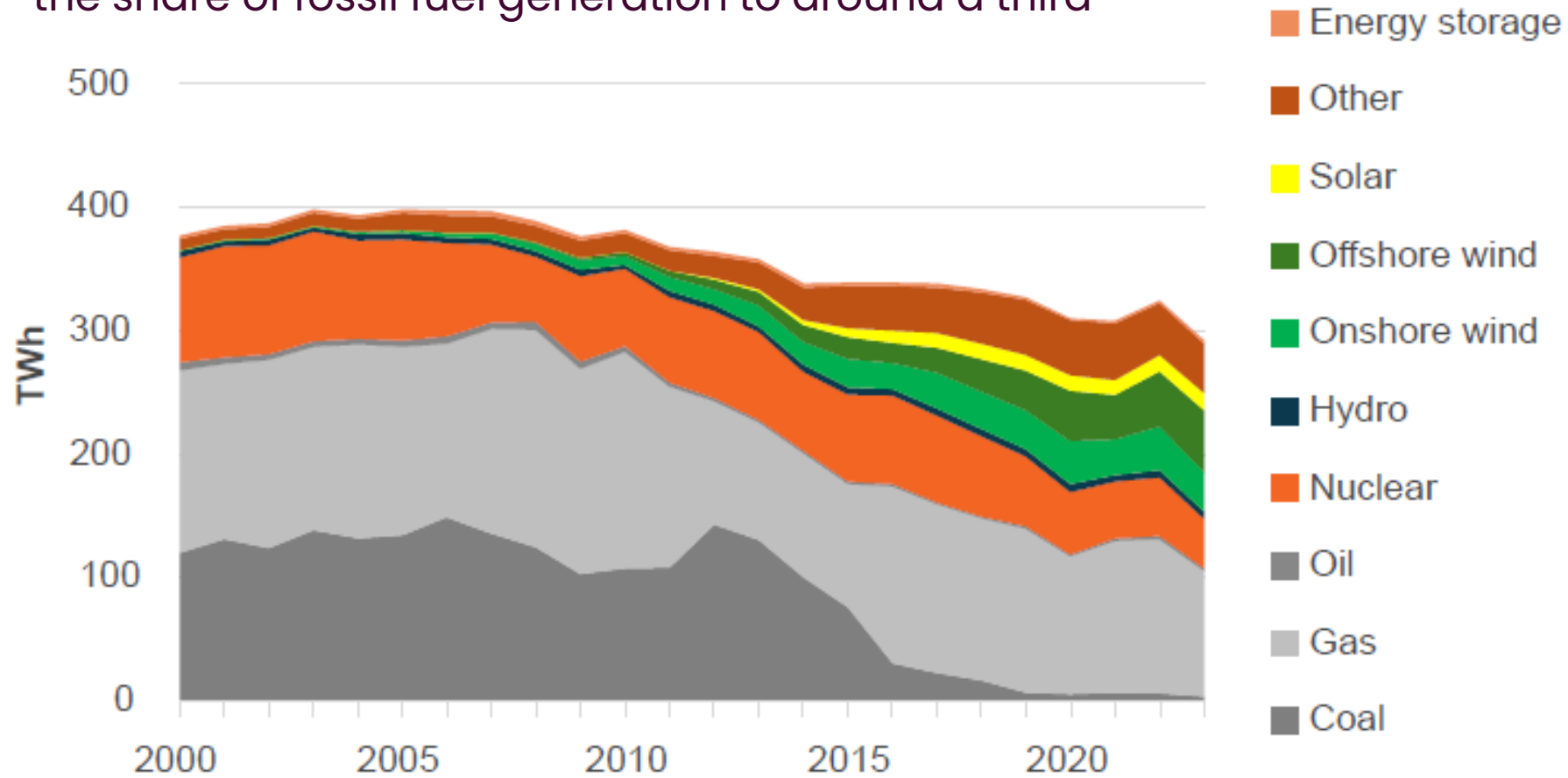
Headline Findings

Headline findings from clean power analysis

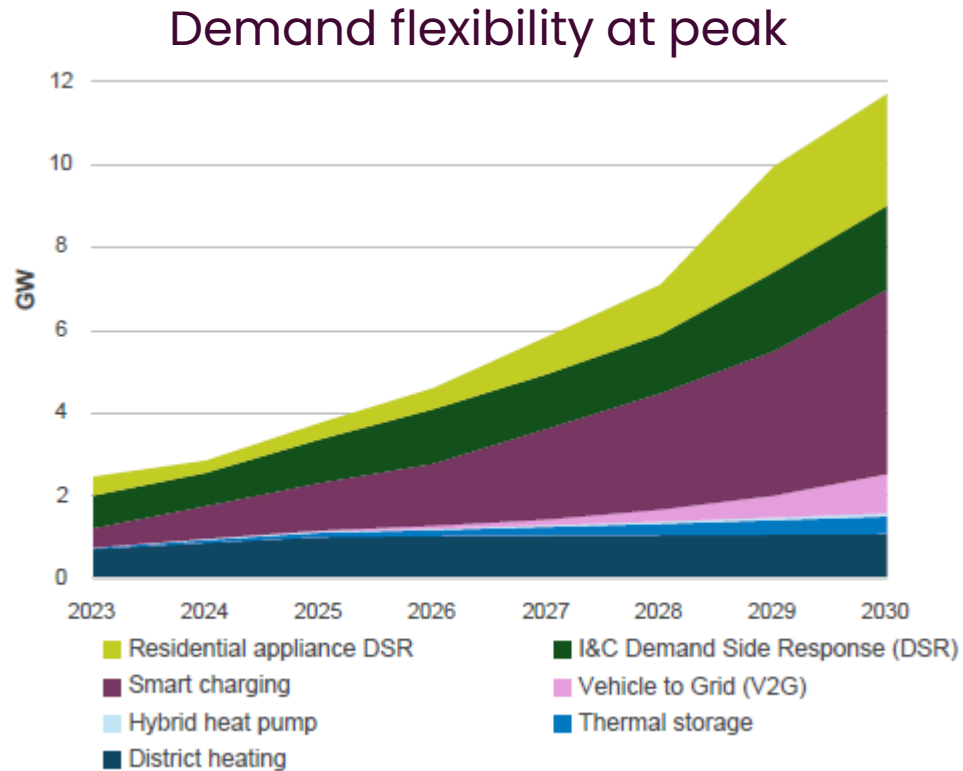
- **Clean power by 2030 is achievable** – it requires a herculean effort, and swift action must be taken immediately from decision makers to unblock delivery challenges.
 - The required energy capacity to deliver clean power is already within the grid connections pipeline.
 - The required electricity transmission network is already under development and was recommended over two years ago by NESO & Ofgem.
- **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

The foundations are in place

Efficiency and clean sources have already reduced the share of fossil fuel generation to around a third



New sources of flexibility are vital for clean power



Long Duration Energy Storage (LDES) up from 3 GW to 5-8 GW



Interconnector capacity increases from 8.4 to 12.5GW

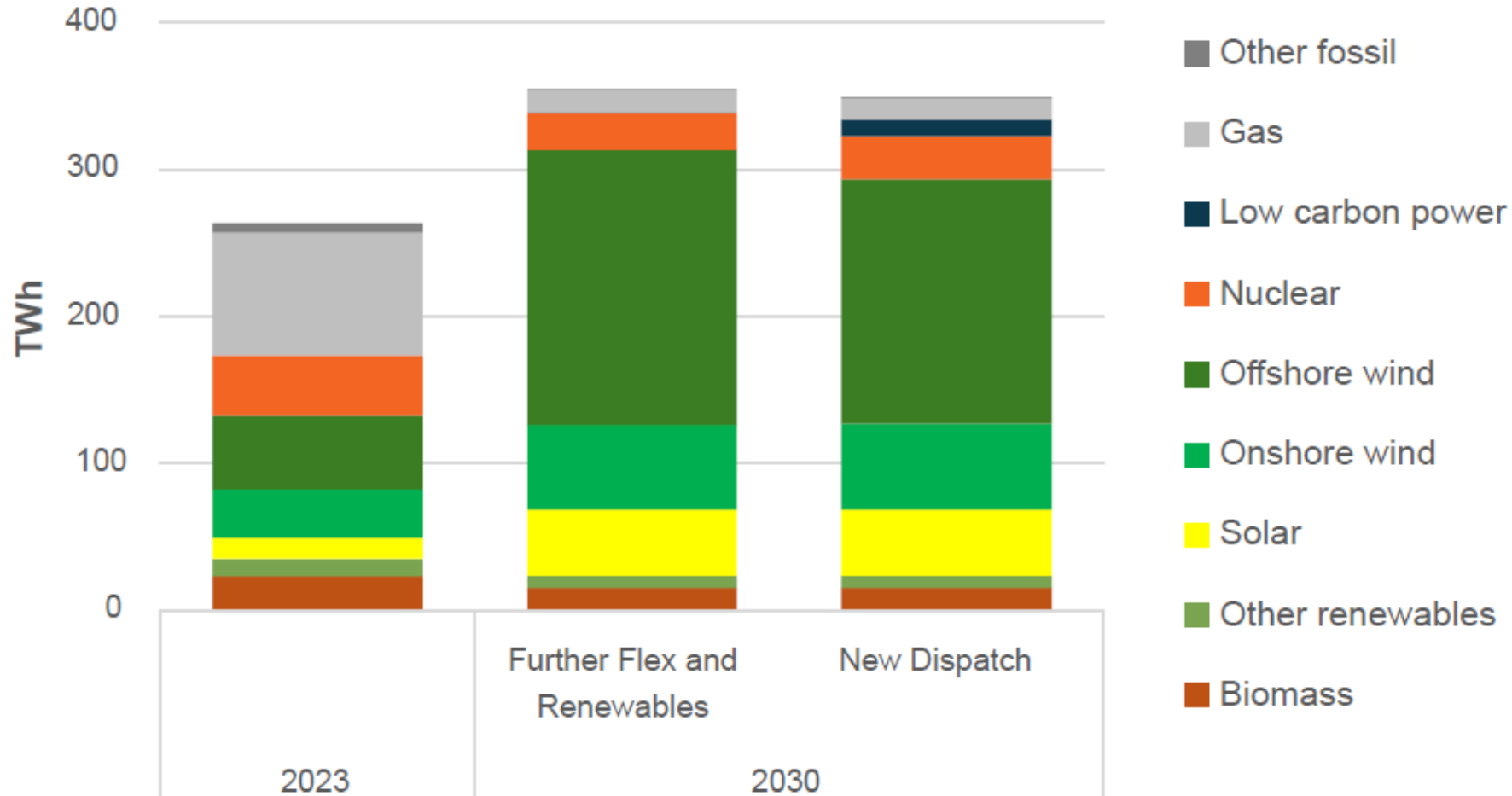


5-6x more battery storage, providing short-term flexibility within day



Clean dispatchable generation has an outsized value

Generation mix for clean power



Renewables required to support 2030 Clean power system



4 - 5x more deployment of renewables

CfD Auction Round 7 & 8 require adequate funding

Entire 2030 offshore wind pipeline required

Planning & consenting times need to reduce

Networks: Major network build out

Delivering the network already planned for 2030 will allow GB to meet Clean Power.

However, success requires double the level of onshore and offshore network build seen in the last 10 years, in the next five. TOs have highlighted concerns around deliverability.

Context: The last decade

GB has delivered around 313km of onshore and 2092km of offshore network in last 10 years.

For Clean Power 2030

Deliver the 88 transmission projects recommended in 'Pathway to 2030' (2022)

Requires up to £60bn of investment, and delivers 988km of onshore and 4650km of offshore network

What is needed

Rapid decisions from Ofgem needed on network build and funding to accelerate progress on these projects.

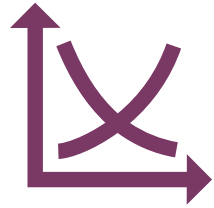
Bold action on planning, with engagement with communities reducing planning timescales by a half (e.g. to around 9 months for DCO)

Action needed to tackle supply chain barriers. TOs / DNOs will need to work closely with Ofgem, DESNZ and industry to identify and resolve specific challenges.

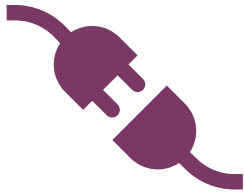
Pink projects that need accelerated delivery for 2030 clean power
Orange projects where clean power can be achieved without them being online by 2030, but accelerated delivery enables lower constraints



Critical enablers



Markets and investment



Connections reform



Planning, consenting & communities



Supply chains & workforce



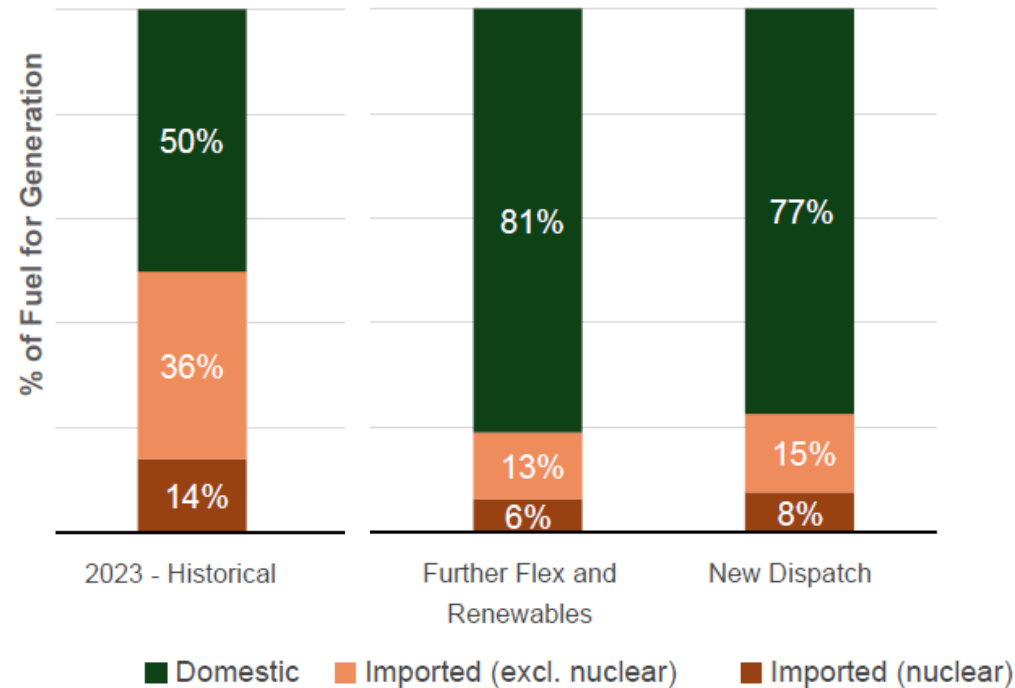
Digitalisation and innovation



NESO as a partner in delivering clean power

Impacts of a clean power system

Split of imported and domestic fuel for generation



CO₂

Reduce emissions below CCC net zero path

Investment, jobs, local economic opportunities

£

Without increase in costs to consumers

Reduced exposure to gas price spikes

Public

Next steps

NESO as delivery partner for 2030 and beyond

NESO will play our part in delivering the Clean Power Mission:

- Connections reform
- Strategic Planning
- System Operation
- Energy Code Reform
- Market evolution
- Strategic advice to Government and Ofgem

