Department for Energy Security & Net Zero

March 2025

Gas in the clean power transition

Sir Denis Rooke Memorial Lecture 2025

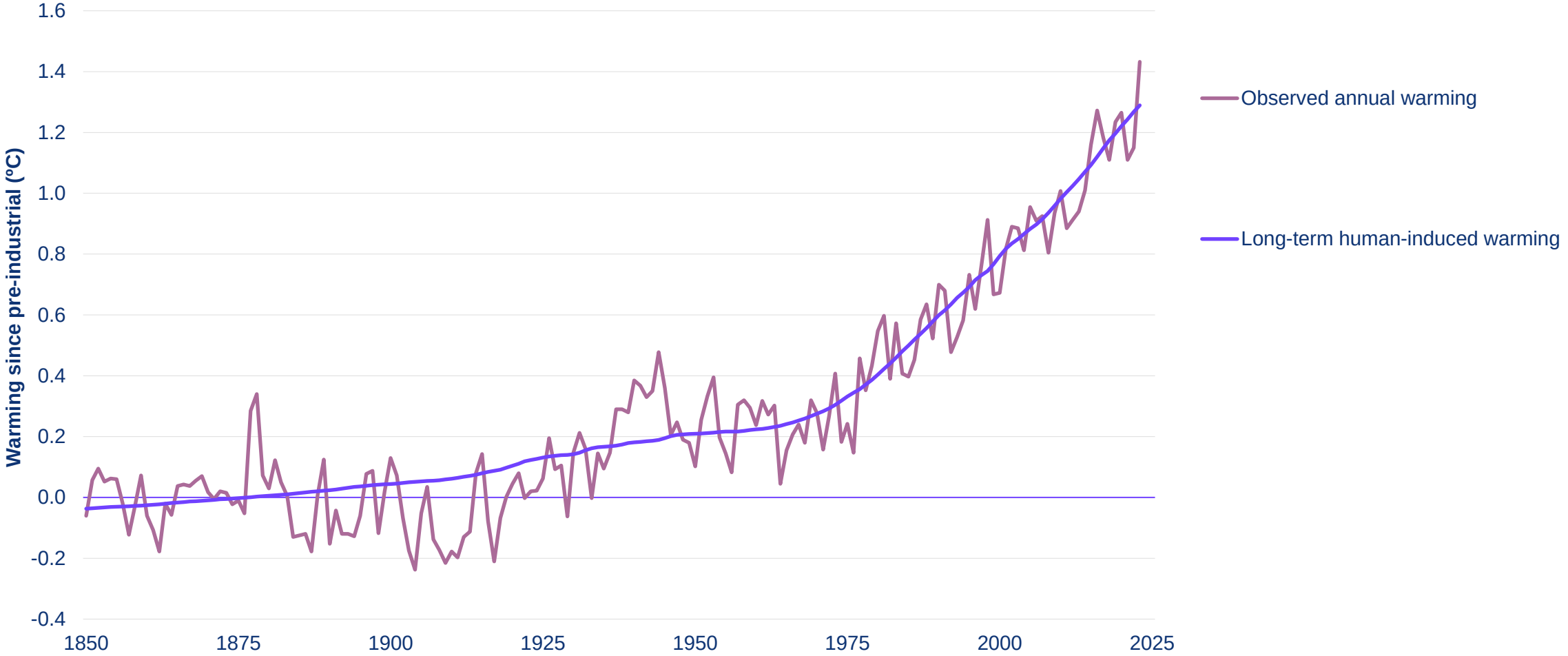
Department for Energy Security & Net Zero

Why (mostly) clean power?

Department for Energy Security & Net Zero

Climate change

Global average surface temperature relative to pre-industrial levels



Source

Smith, C. et al (2024) Climate indicator data: indicators of global climate change 2023 revision.

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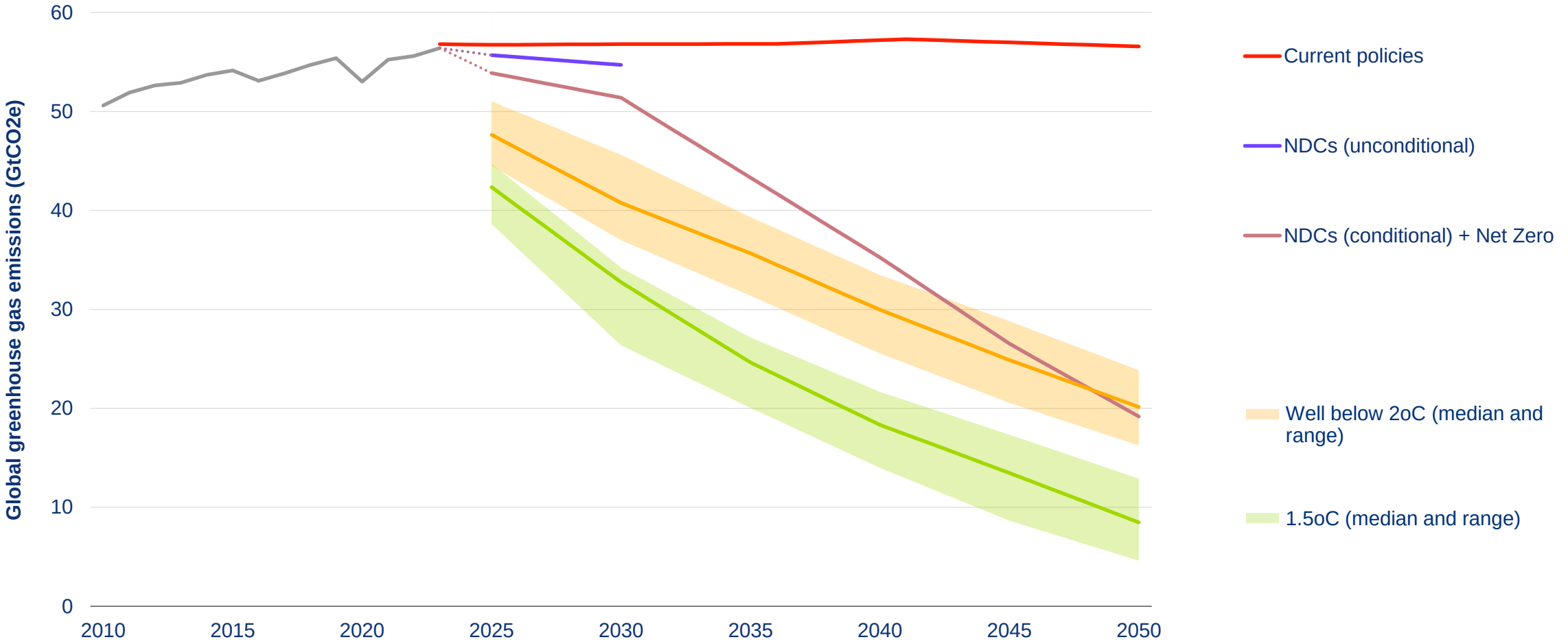
Climate change

Global emissions pathways not on track



Source

Rogelj, J., Den Elzen, M.G.J. and Portugal Pereira, J. (2024) The UNEP Emissions Gap Report 2024

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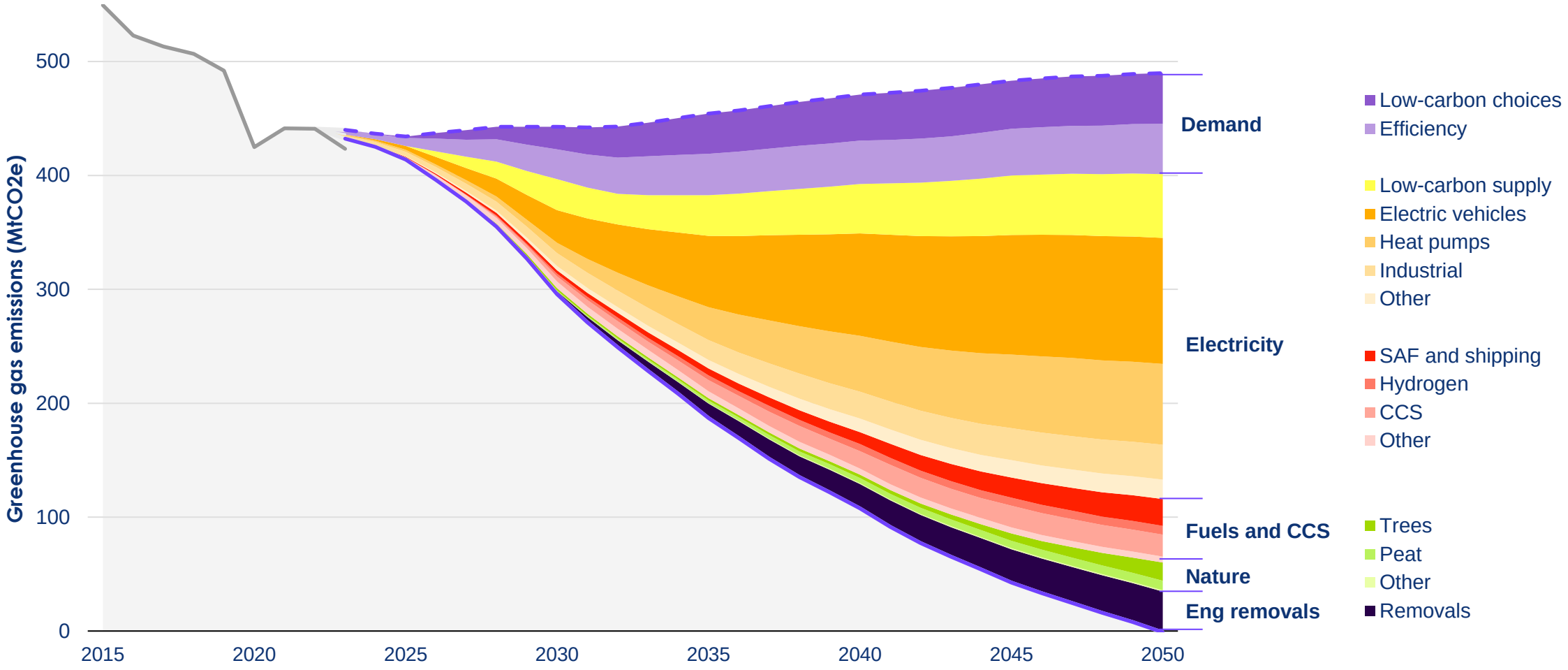
Why Clean Power?

Cross-economy abatement in Carbon Budget 7 pathway



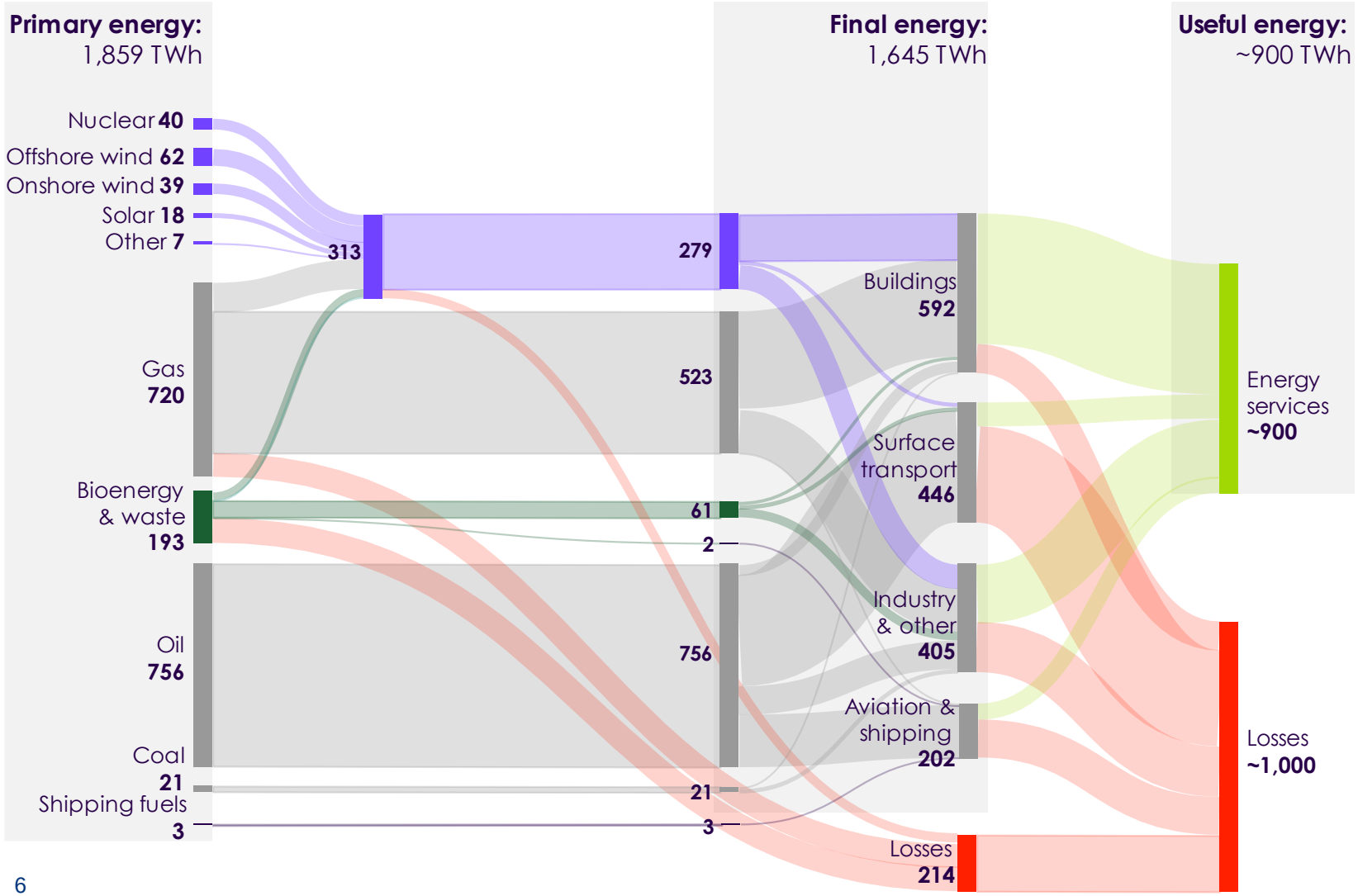
Source

CCC Analysis 2025

Department for Energy Security & Net Zero

Why Clean Power?

Transformation of the energy system (2025)



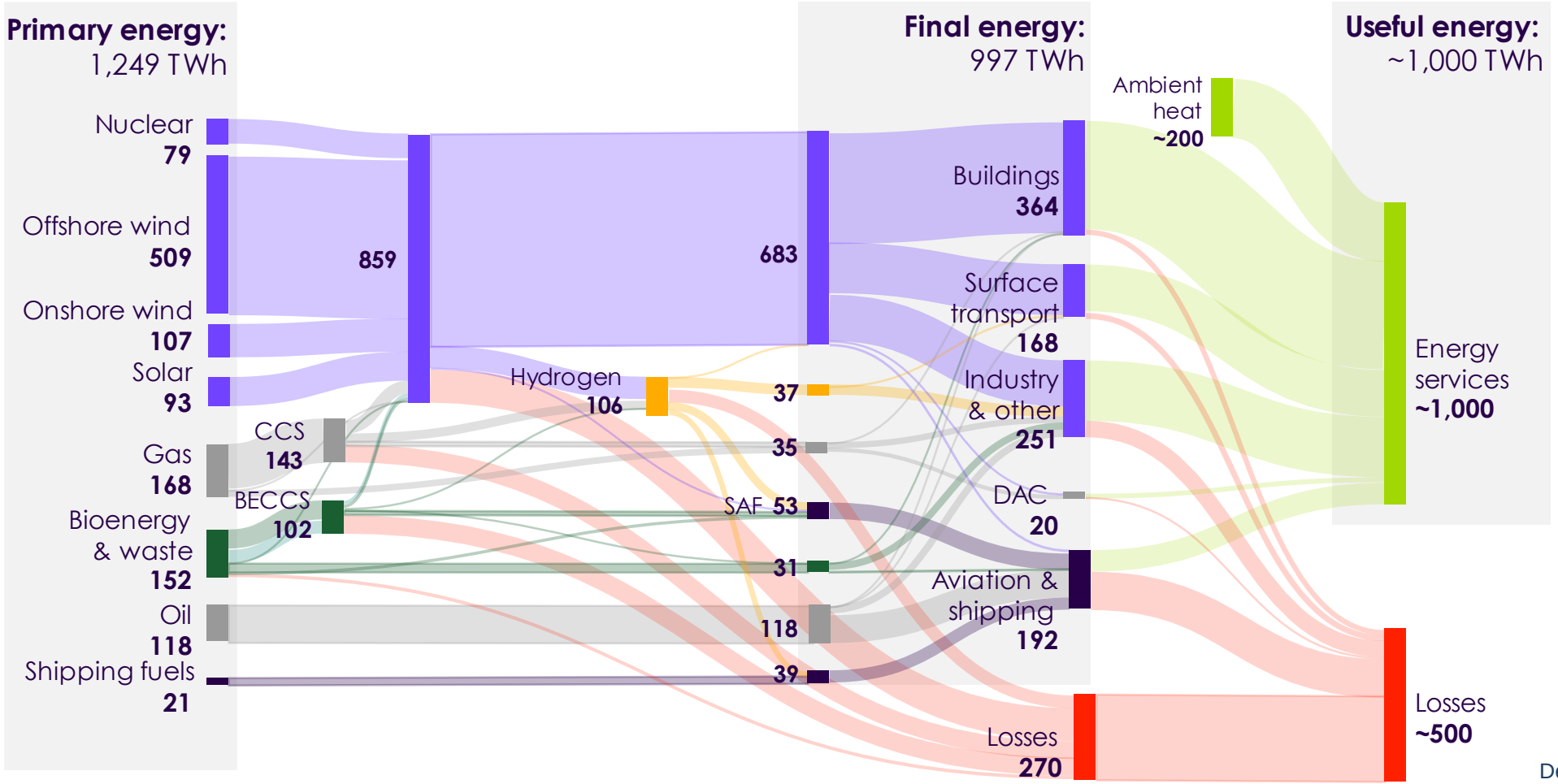
Source

Department for Business, Energy and Industrial Strategy (2019) Experimental statistics on whole UK energy flow incorporating end use energy efficiency; CCC analysis

Department for Energy Security & Net Zero

Why Clean Power?

Transformation of the energy system (2050)



Source

Department for Business, Energy and Industrial Strategy (2019) Experimental statistics on whole UK energy flow incorporating end use energy efficiency; CCC analysis

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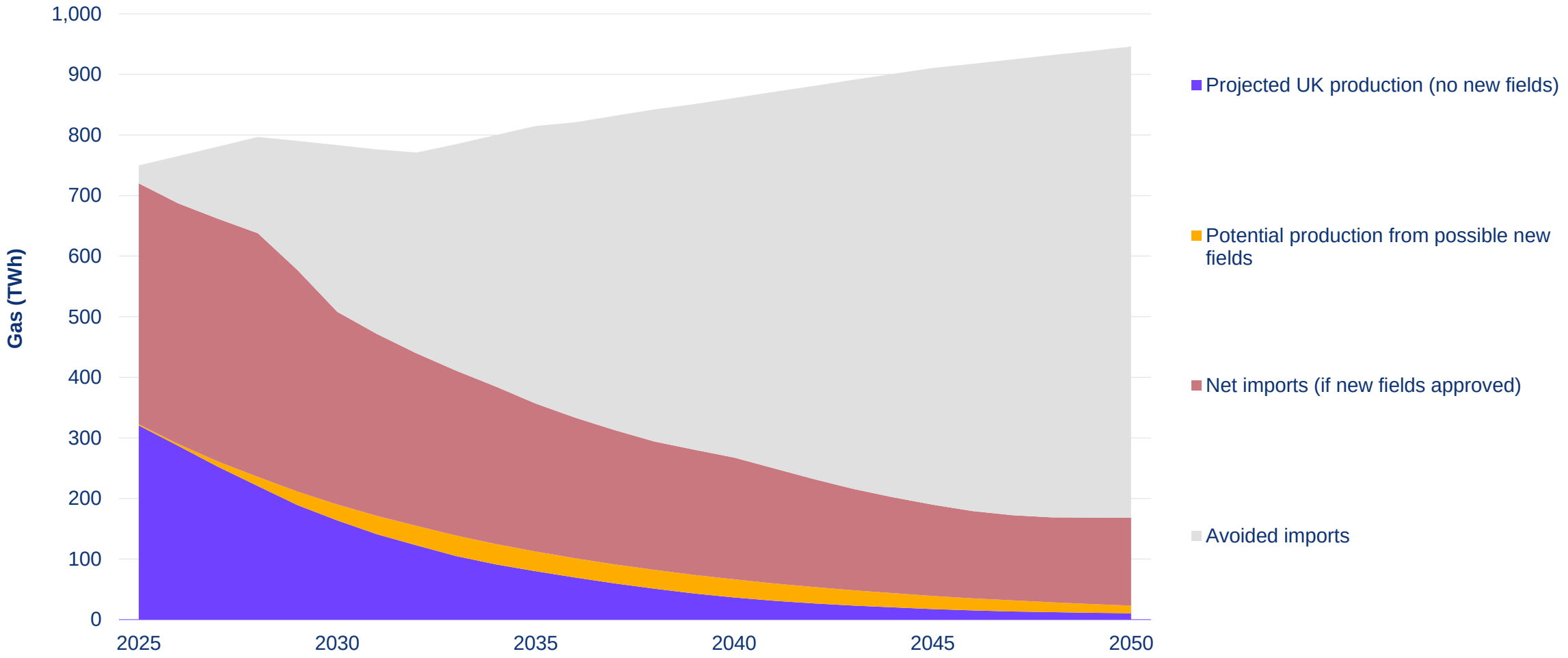
Why Clean Power?

UK consumption and imports of gas to 2050



Source

North Sea Transition Authority (2024) March 2024 Projections of UK Oil and Gas Production and Expenditure; CCC analysis

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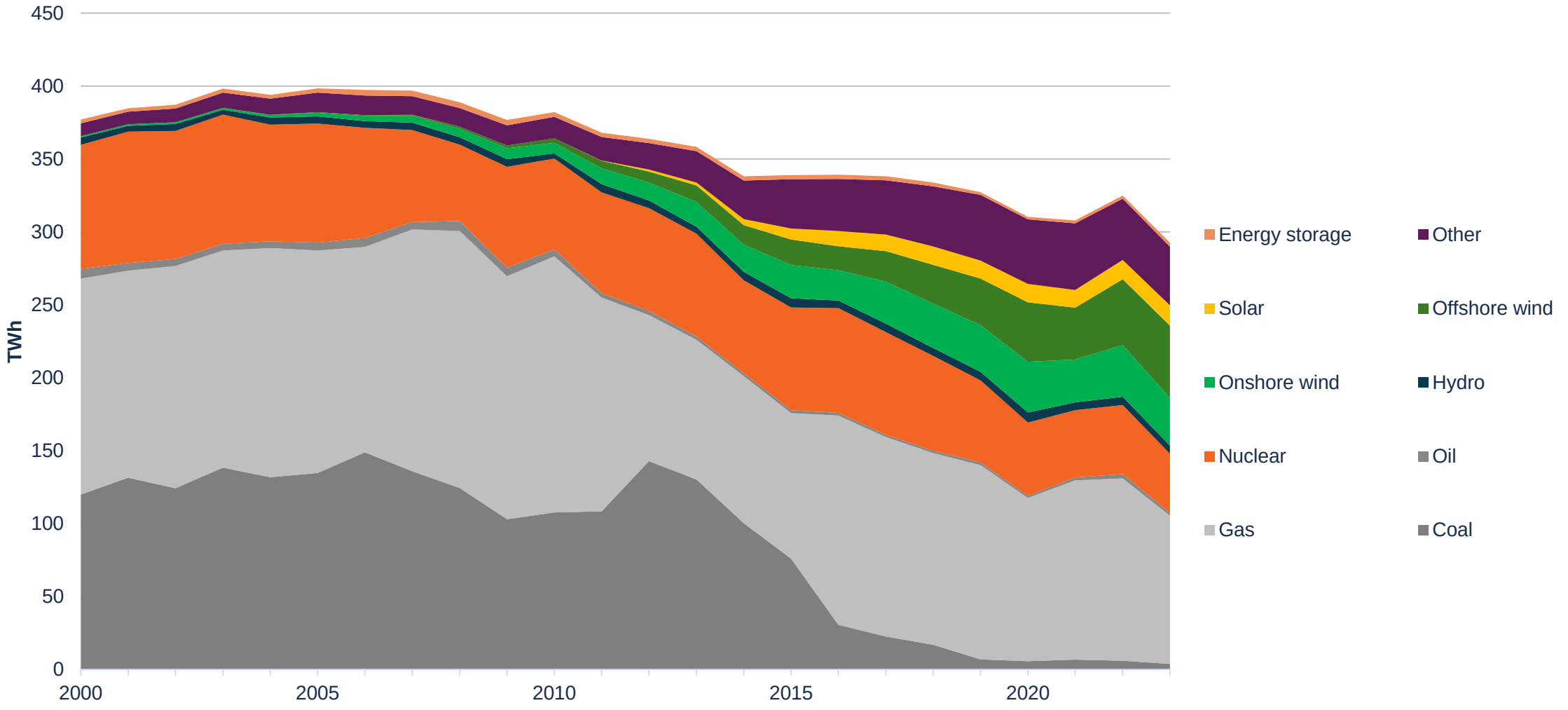
Achieving clean power

Department for Energy Security & Net Zero

Clean Power 2030

Clean sources reducing the share of fossil generation in the UK



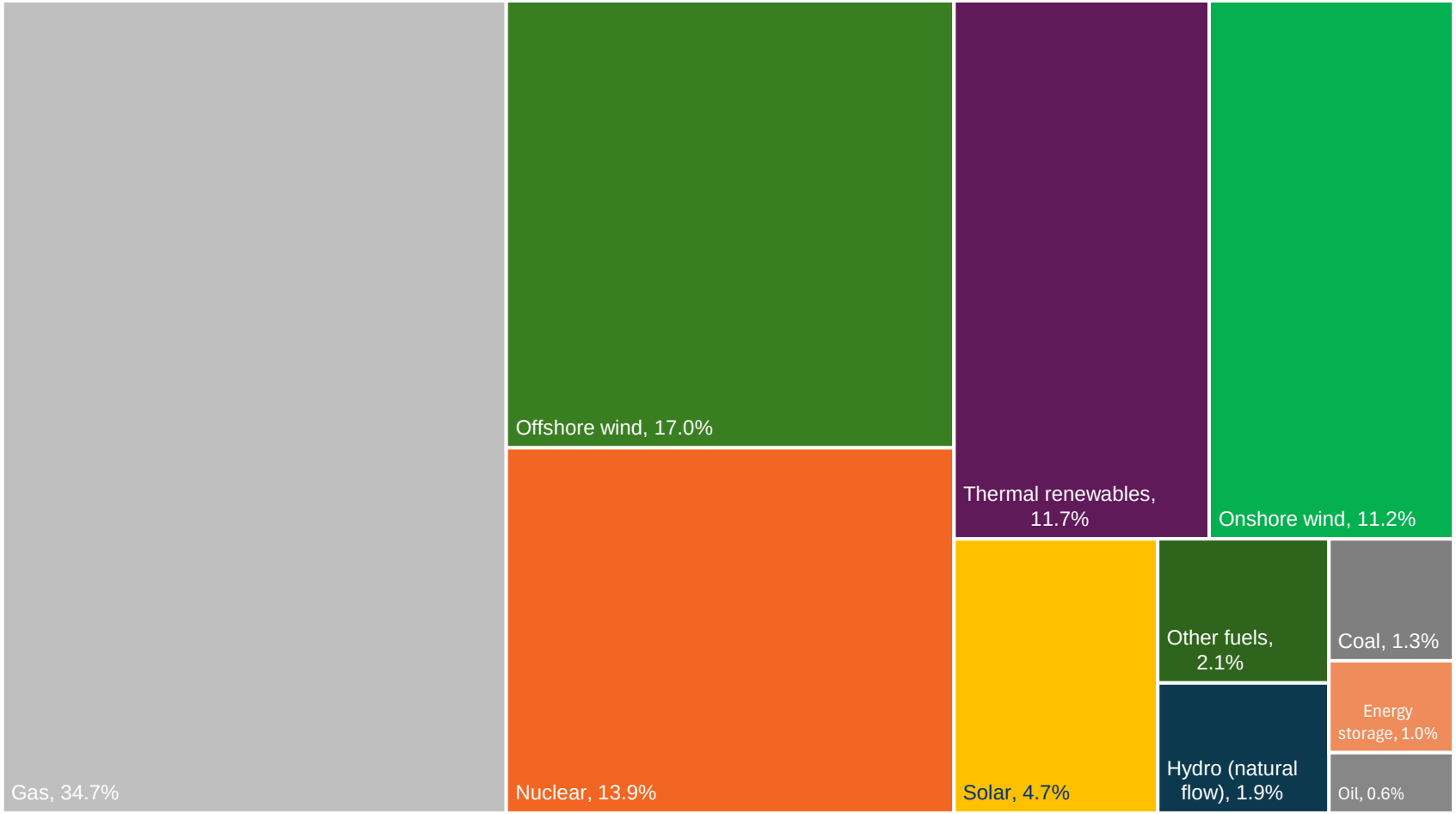
Source

DUKES (2024), Table 5.6.B

Department for Energy Security & Net Zero

Clean Power 2030

Share of electricity generated (GWh) in 2023



Source

DESNZ (2024), DUKES 2024

Department for Energy Security & Net Zero

Clean Power 2030

Change in consumer demand by 2030

Source

NESO "*Clean Power 2030: Advice on achieving clean power for Great Britain by 2030*"

Department for Energy Security & Net Zero

Clean Power 2030

Change in consumer demand by 2030

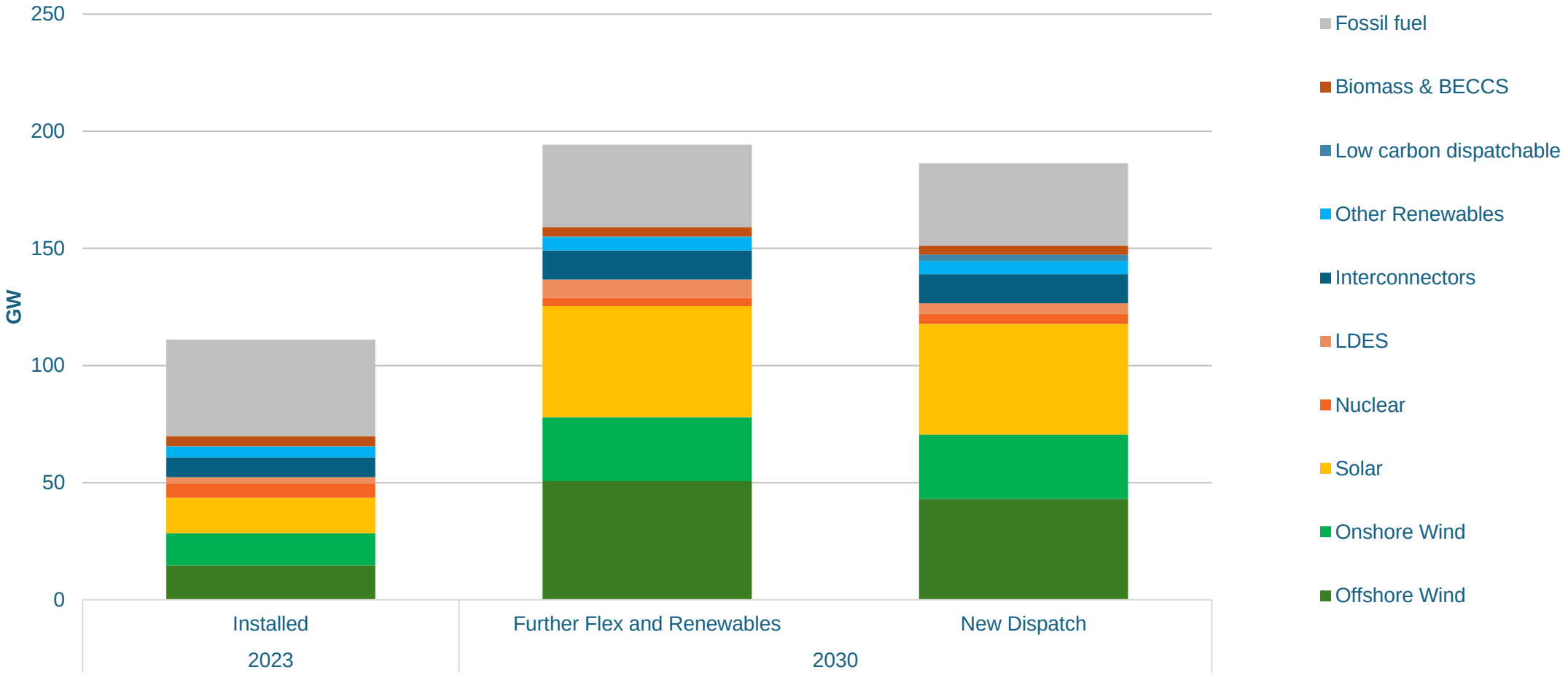
Source

NESO "*Clean Power 2030: Advice on achieving clean power for Great Britain by 2030*"

Department for Energy Security & Net Zero

Clean Power 2030

Capacity mixes for 2023 and 2030



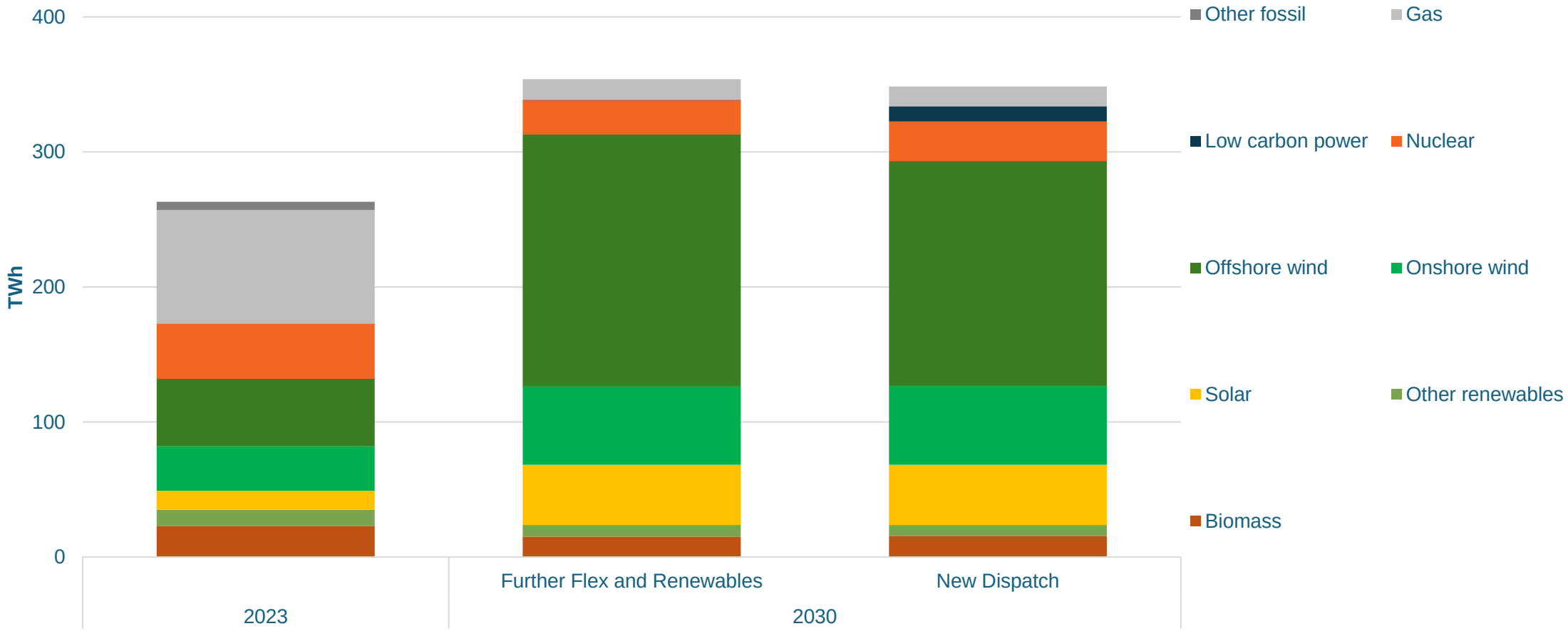
Source

NESO "*Clean Power 2030: Advice on achieving clean power for Great Britain by 2030*"

Department for Energy Security & Net Zero

Clean Power 2030

Generation in a clean British power system in 2030



Source

NESO "*Clean Power 2030: Advice on achieving clean power for Great Britain by 2030*"

Department for Energy Security & Net Zero

Clean Power 2030

Capacity range for 2030 (GW)

Technology	Current installed capacity	NESO 'Further Flex and Renewables'	NESO 'New Dispatch'	DESNZ 'Clean Power Capacity Range'
Variable				
Offshore wind	14.8	51	43	**43 – 50**
Onshore wind	14.2	27	27	**27 – 29**
Solar	16.6	47	47	**45 – 47**
Firm				
Nuclear	5.9	4	4	**3 – 4**
Dispatchable				
Low Carbon Dispatchable Power	4.3	4	7	**2 – 7**
Unabated gas	35.6	35	35	**35**
Flexible				
LDES	2.9	8	5	**4 – 6**
Batteries	4.5	27	23	**23 – 27**
Interconnectors	9.8	12	12	**12 – 14**
Consumer-led flexibility	2.5	12	10	**10 – 12**

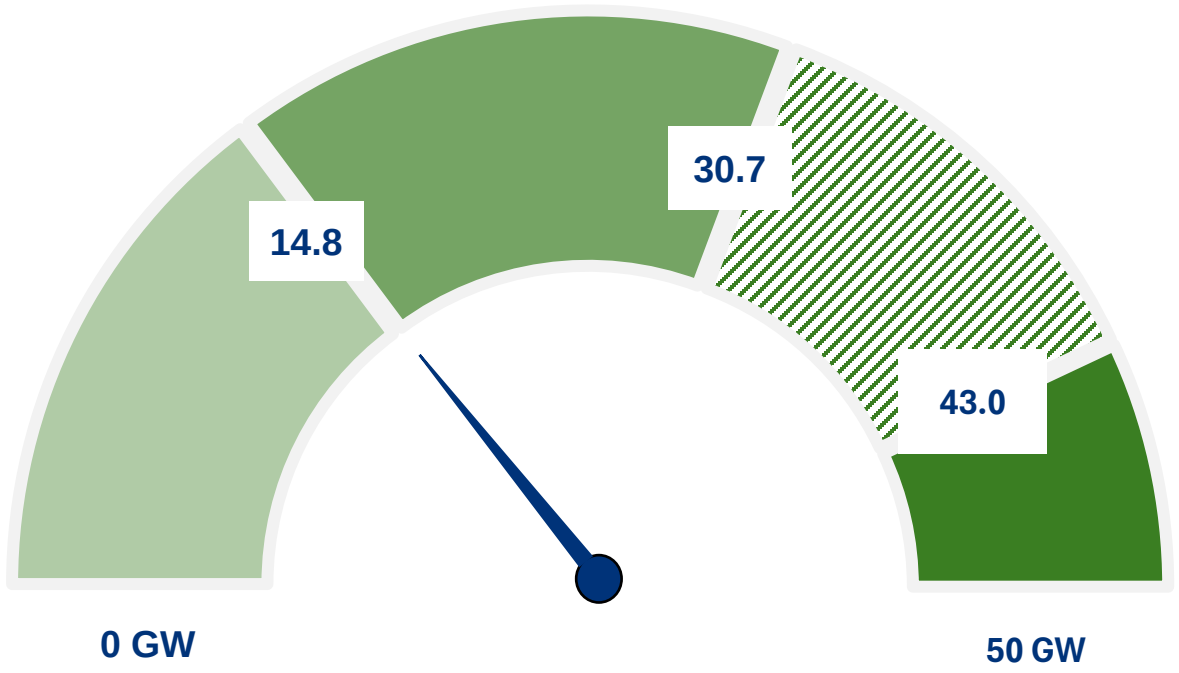
Source

Clean Power 2030 Action Plan

Department for Energy Security & Net Zero

Clean Power 2030

Offshore wind capacity range for 2030 (GW)



- Current installed capacity Q2 2024
- Committed or under construction
- Gap to the DESNZ Clean Power capacity range
- DESNZ Clean Power capacity range 2030

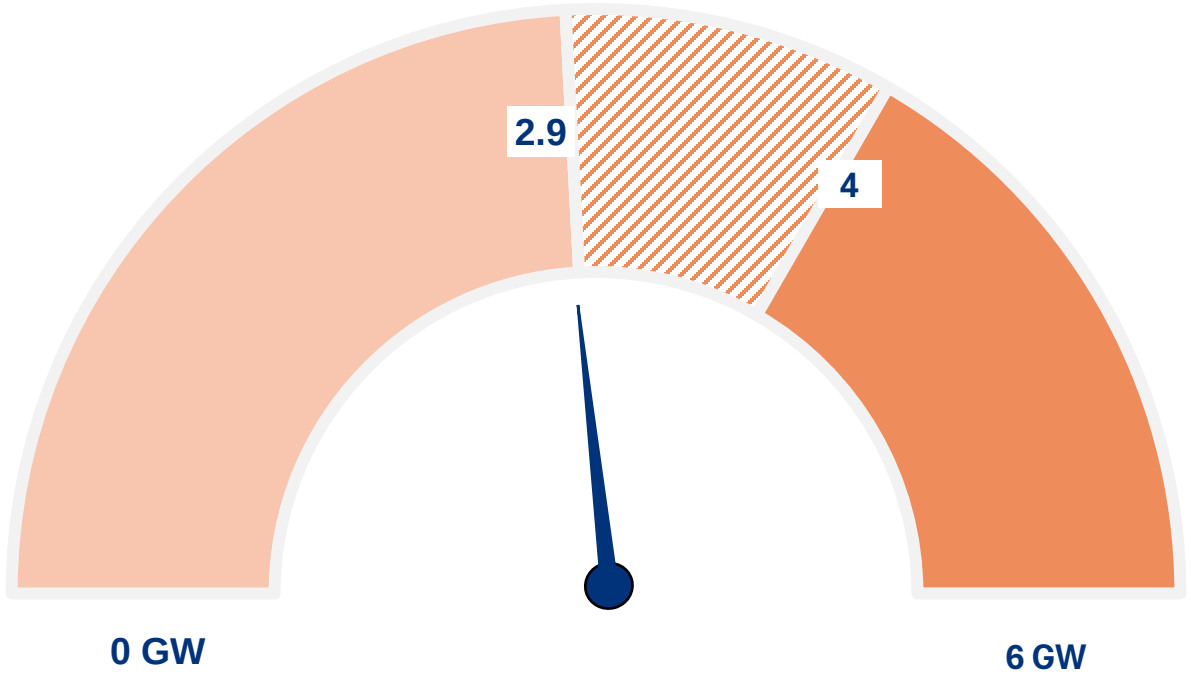
Source

Clean Power 2030 Action Plan

Department for Energy Security & Net Zero

Clean Power 2030

Long duration energy storage range for 2030 (GW)



- Current installed capacity 2024
- Gap to the DESNZ Clean Power capacity range
- DESNZ Clean Power capacity range 2030

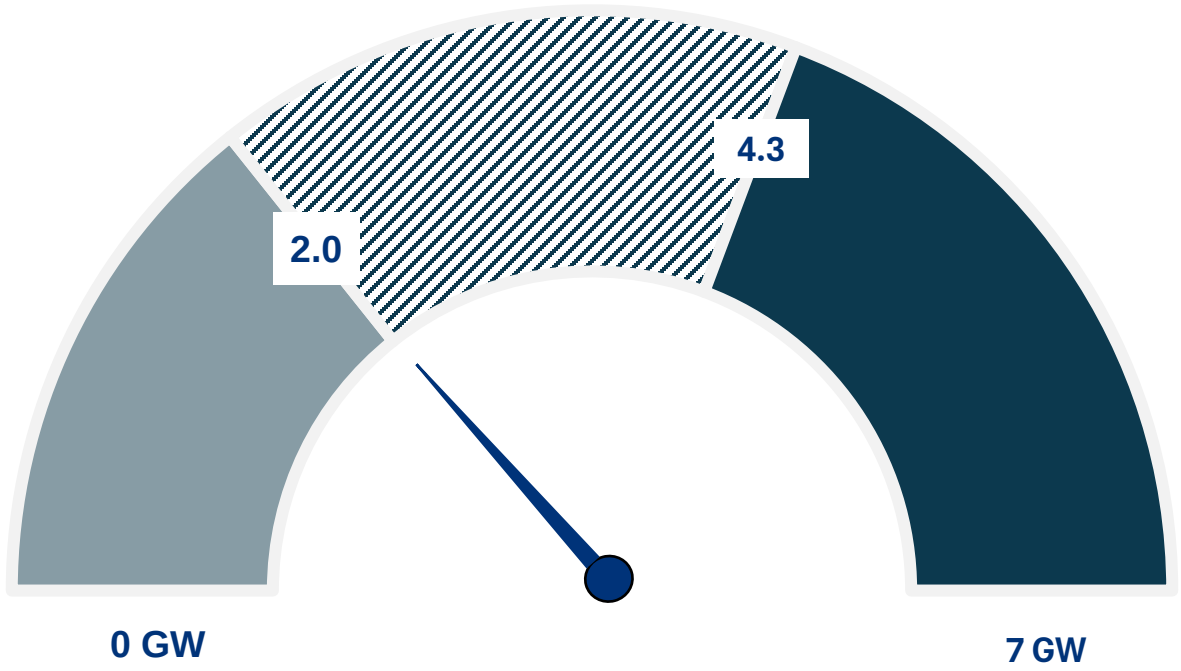
Source

Clean Power 2030 Action Plan

Department for Energy Security & Net Zero

Clean Power 2030

Low-carbon dispatchable range for 2030 (GW)



- Current installed capacity 2024
- Gap to the DESNZ Clean Power capacity range
- DESNZ Clean Power capacity range 2030

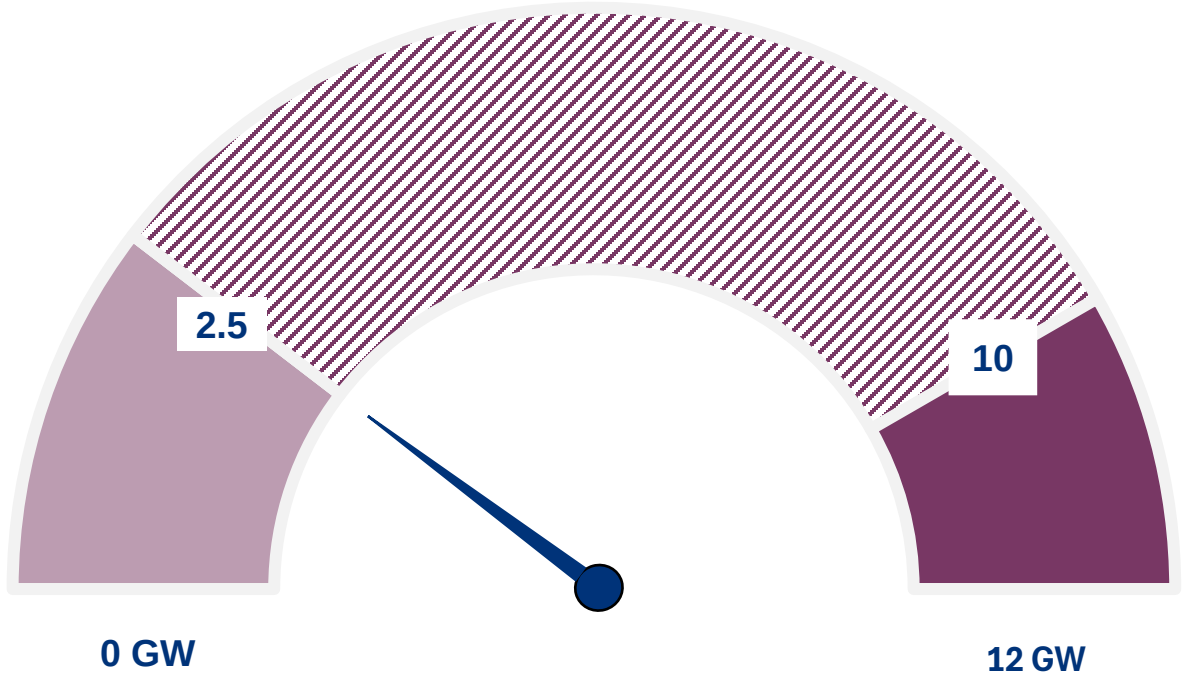
Source

Clean Power 2030 Action Plan

Department for Energy Security & Net Zero

Clean Power 2030

Consumer-led flexibility range for 2030 (GW)



- Current installed capacity 2024
- Gap to the DESNZ Clean Power capacity range
- DESNZ Clean Power capacity range 2030

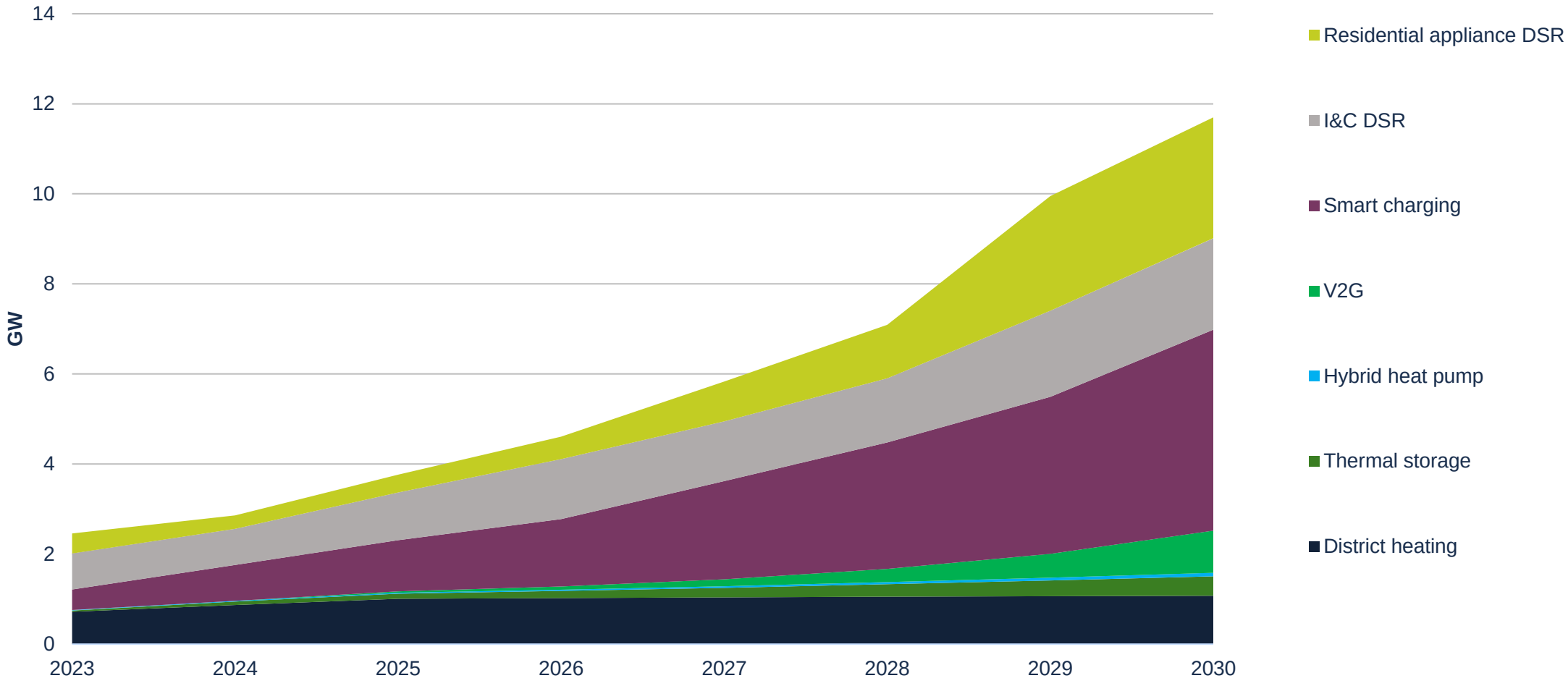
Source

Clean Power 2030 Action Plan

Department for Energy Security & Net Zero

Clean Power 2030

Consumer-led flexibility at peak



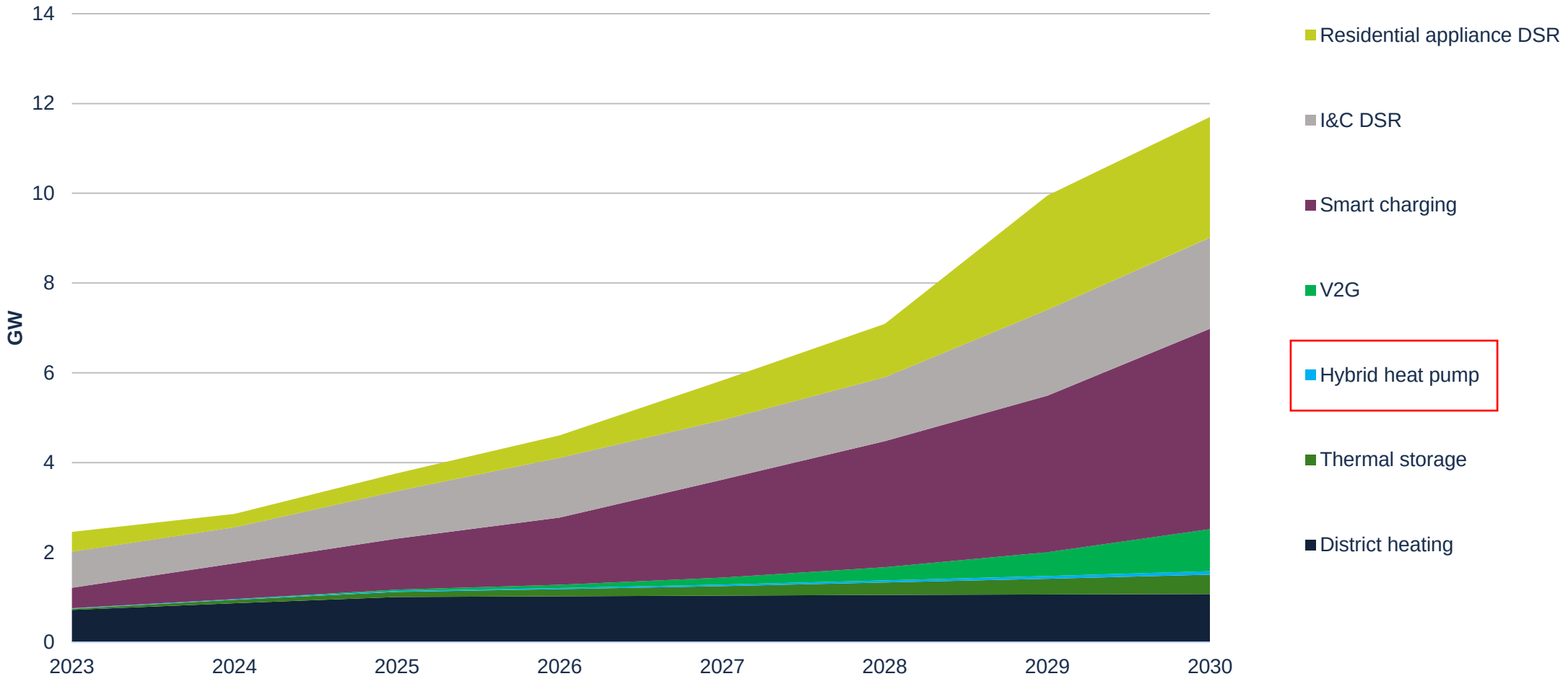
Source

NESO "*Clean Power 2030: Advice on achieving clean power for Great Britain by 2030*"

Department for Energy Security & Net Zero

Clean Power 2030

Consumer-led flexibility at peak



Source

NESO "*Clean Power 2030: Advice on achieving clean power for Great Britain by 2030*"

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Clean Power 2030

80+ transmission works by 2030

88 wider works to bring benefits to the whole transmission system
For meeting clean power target and reducing constraint costs

80 works
Must be delivered by 2030 to meet clean power

8 works
Acceleration beneficial

9 works
Already built

68 works
On timetable

3 works
Must be accelerated

4 works
Stage 1 - Scoping

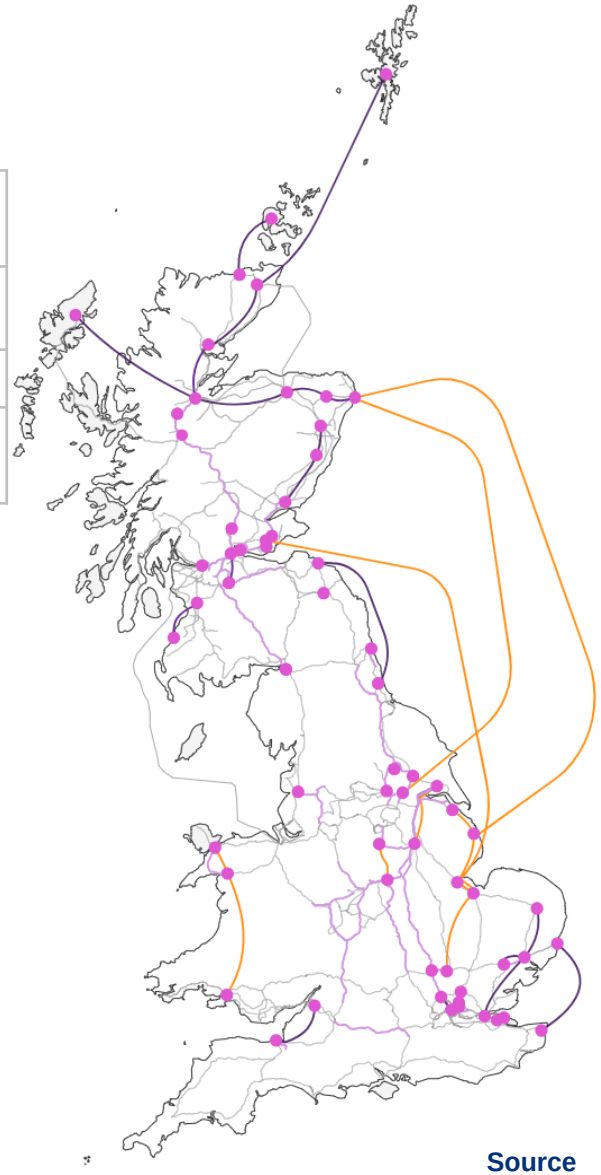
24 works
Stage 2 – Strategic Optioneering

16 works
Stage 3 – Design / development and consenting

10 works
Stage 4 – Planning / consenting

17 works
Stage 5 - Construction

	New critical network infrastructure for 2030
	Network upgrades (substations and lines)
	Existing network
	Acceleration would reduce constraint costs



Source

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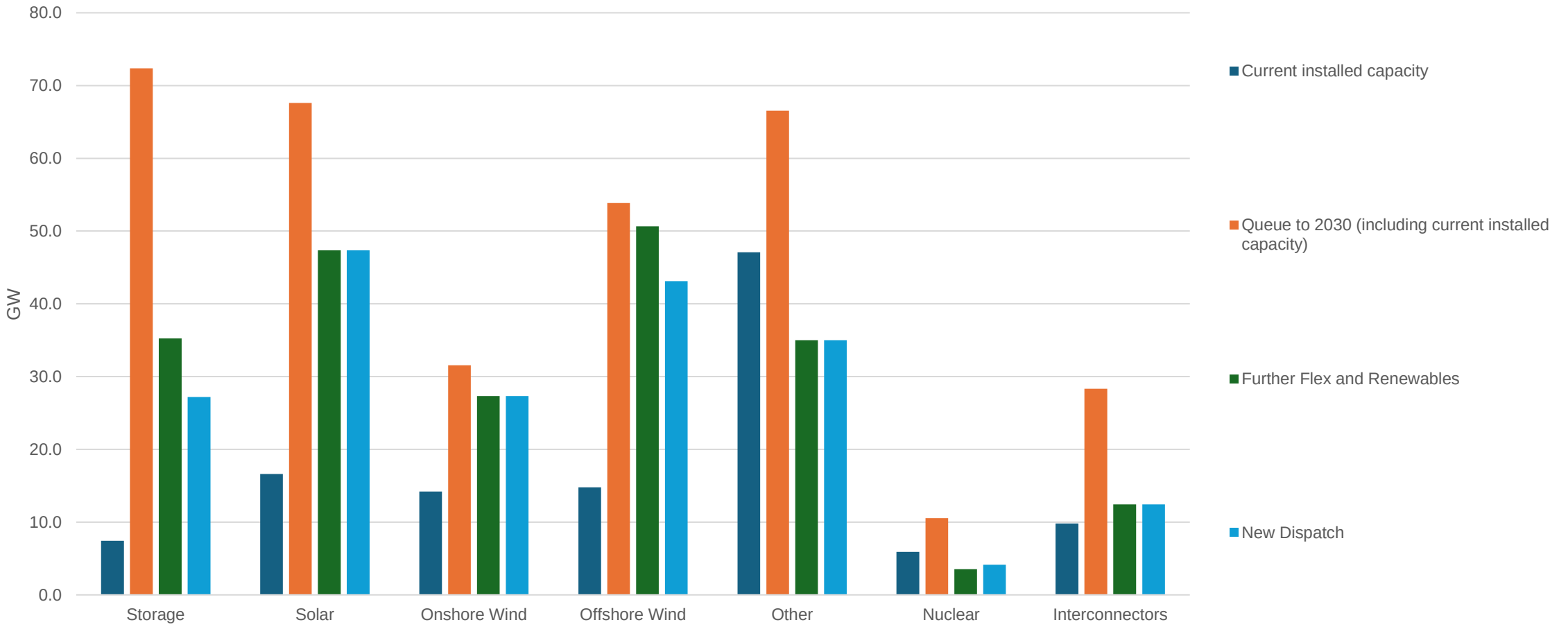
Clean Power 2030

Current connections queue against GB clean power scenarios by technology



Source

Clean Power 2030 Action Plan

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A shared mission?

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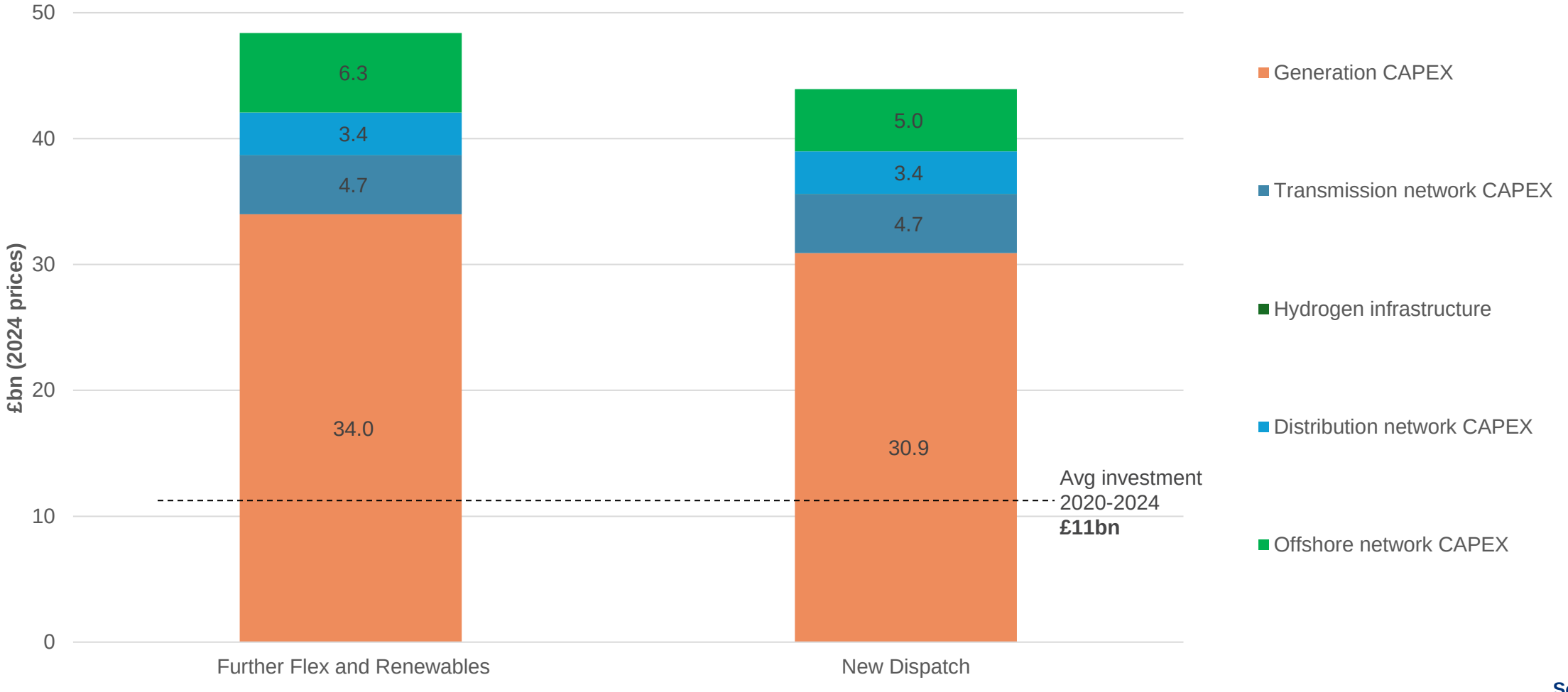
Clean Power 2030

Average annual investment system costs in clean power pathways 2025-2030



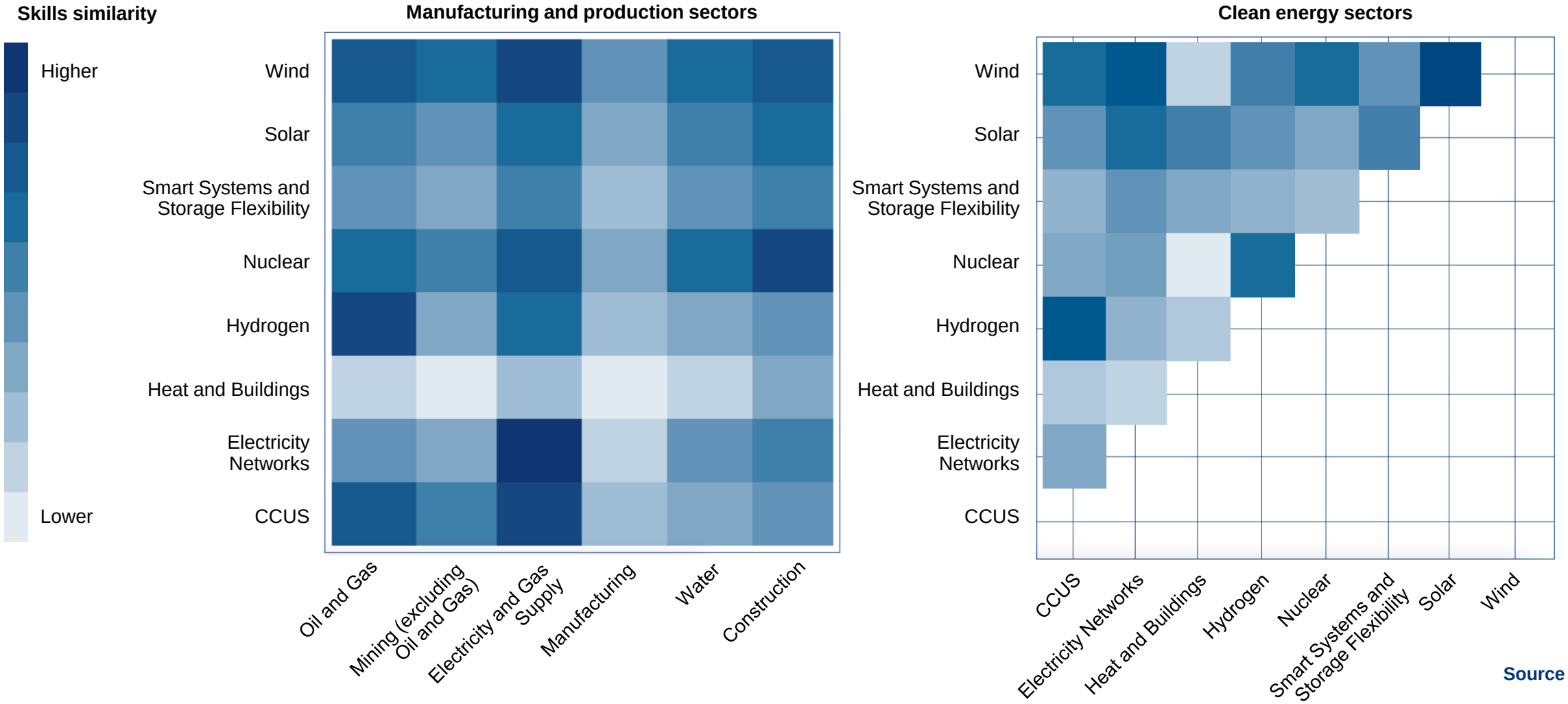
Source

NESO "*Clean Power 2030: Advice on achieving clean power for Great Britain by 2030*"

Department for Energy Security & Net Zero

Clean Power 2030

Workforce challenge - similarity of skills demanded



Source

Clean Power 2030 Action Plan

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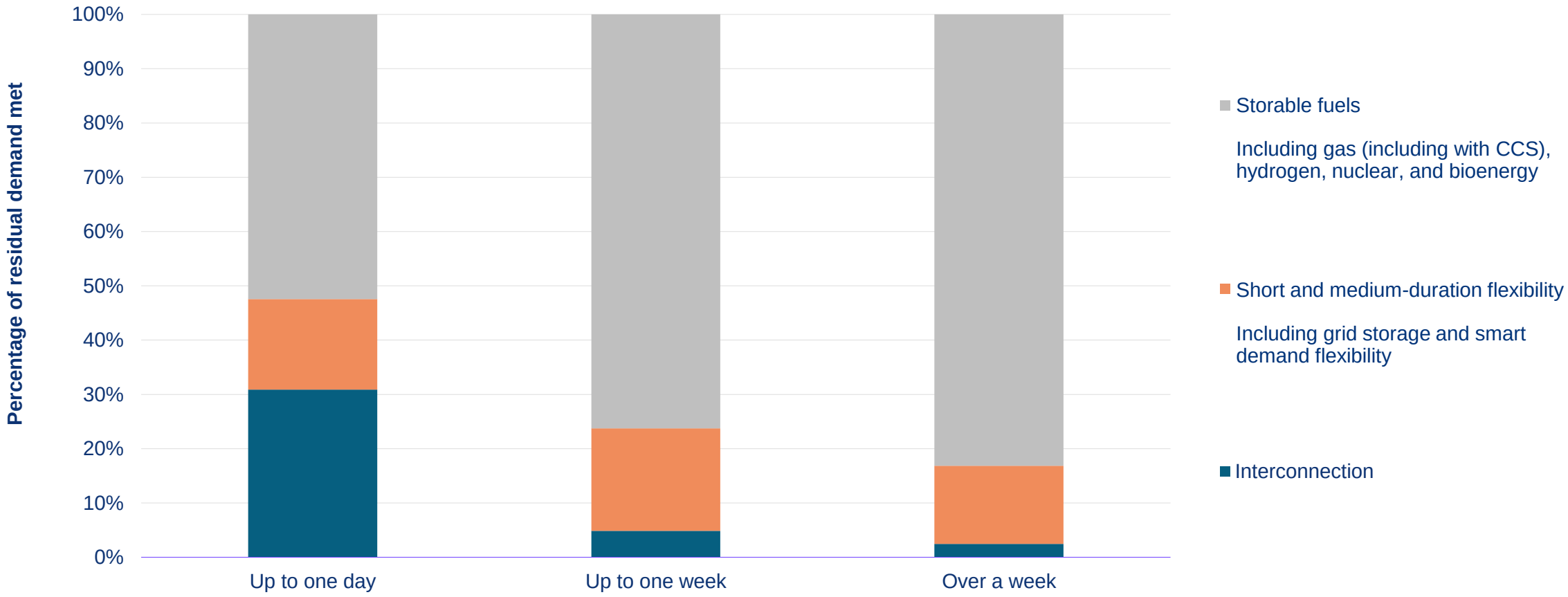
Clean Power 2030

Meeting residual demand (after renewables) in 2040 a 1-in-20 weather year



Source

CCC and AFRY analysis, Seventh Carbon Budget advice (2025)

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