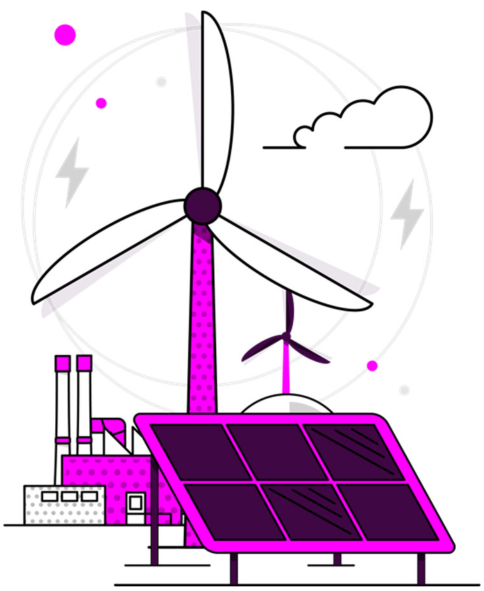
Future Energy Scenarios: Pathways to Net Zero

Changes since FES 2024

July 2025

NESO
National Energy System Operator

Contents



1. Introduction

Introduction

Our *Future Energy Scenarios: Pathways to Net Zero* (*FES 2025*) take account of national and international policy developments, decarbonisation targets, technology advancement, progress and stakeholder feedback to ensure updates are robust.

Changes in macroeconomics assumptions, such as GDP growth, population and industrial activity directly influence the energy demand set out in our pathways. Shifts in energy price forecasts, fuel availability and global market dynamics also play a critical role.

Crucial to our updated analysis is incorporating recent data on energy usage, project developments and deployment progress, alongside revisions to modelling methodologies and tools.

Assumptions and assurance are the foundations on which our pathway modelling is built. The energy system is highly complex, with a growing number of independent factors. Different inputs and assumptions lead to different outcomes and, by varying our assumptions across the pathways, we can explore a range of futures.

Comparing our *FES 2025* analysis with *FES 2024* helps highlight key drivers of change, emerging trends and areas of uncertainty in the evolving energy landscape.

A year in energy: developments at a glance

- **Connections reform.** Connections reform is underway following Ofgem's acceptance of NESO proposals in April 2025.
- **Industrial clusters.** The first revenue support contracts for low carbon hydrogen and carbon capture projects were awarded in late 2024, underpinning industrial clusters. A second allocation round was launched in spring 2025.
- **Establishment of NESO.** The UK's 2023 Energy Act set the legislative framework for an independent system planner and operator to help accelerate Great Britain's energy transition, leading to the establishment of the National Energy System Operator (NESO).
- **Clean Power 2030.** The Government set out its Clean Power Action Plan in December 2024.
- **Market Reform.** The Government set out its decision on the Review of Electricity Market Arrangements (REMA) in July 2025.

This document provides a summary of the key changes between *FES 2024* and *FES 2025* and the assumptions that have the biggest impact on our modelling outputs on supply, demand and emissions pathways to 2050.

A detailed register of inputs and assumptions can be found in our supporting *FES 2025 Pathway Assumptions Log*.

The FES Framework

The FES framework is designed to guide the analysis for credible pathways to deliver Great Britain’s 2050 net zero, exploring areas of uncertainty and where important decisions will be needed.

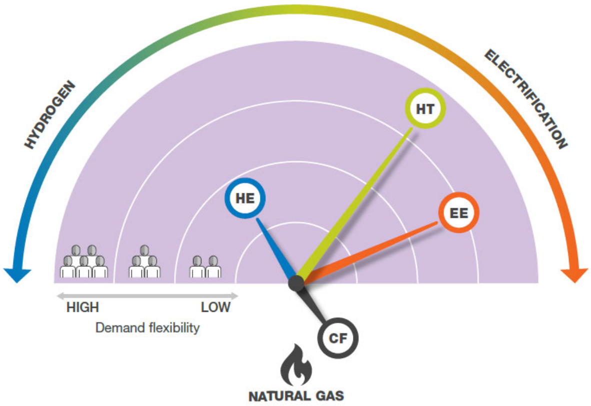
Since 2020, our pathways (formerly scenarios) have been defined by two metrics: demand flexibility and decarbonised energy mix (hydrogen/electrification). These levers reflect the contemporary challenges and ambitions of energy usage in Great Britain.

Following *FES 2024*, NESO published analysis on achieving clean power, which informed the *Clean Power 2030* advice. The framework for our clean power analysis focused on supply side technologies, looking at renewables-based systems and new low carbon dispatchable power. Stakeholder feedback was positive, both on the changes to the *FES 2024* framework and that used to develop our *Clean Power 2030* advice.

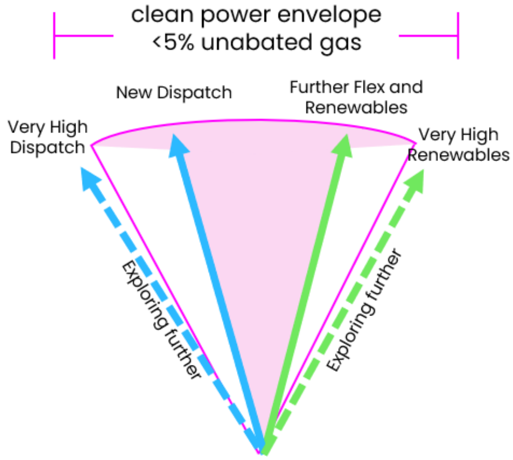
We have brought key elements of each framework together for *FES 2025*. This means considering the three demand pathways with the range of uncertainty around fuel switching and consumer engagement (as in our 2024 pathway analysis) while considering the dispatchable and weather-dependent technology on the electricity and hydrogen supply sides.

The *FES 2024* Counterfactual has been renamed in *FES 2025* as Falling Behind.

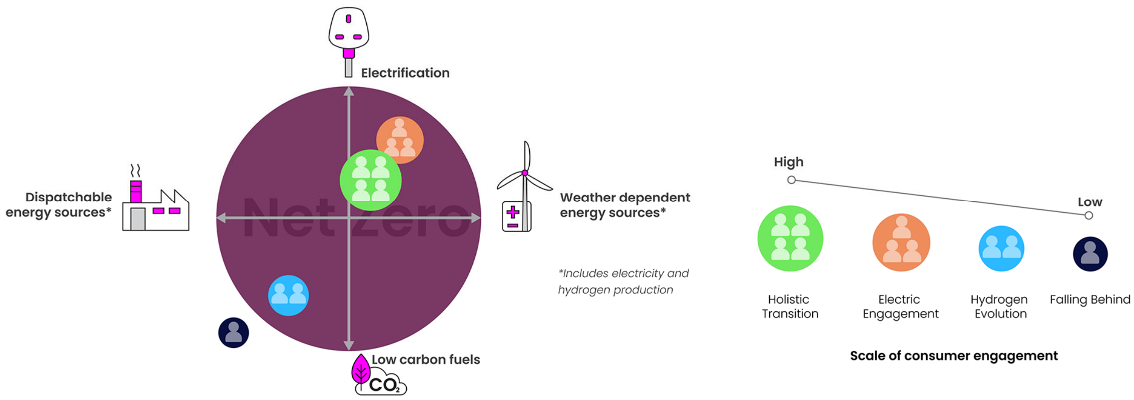
Pathway framework for FES 2024



Pathway framework for Clean Power 2030 advice



Pathway framework for FES 2025



The evolution of the FES framework

Key modelling changes

As the energy system changes, the tools we use to model it must evolve. Improving our tools and data sources is essential for credible long-term pathways and informing our downstream strategic planning and operational processes in a rapidly changing energy landscape.

Key changes to our modelling for 2025 include:

- New industrial and commercial demand models
- New data centre model
- Improvements to spatial heat model
- Electricity and hydrogen combined CEM used for validation
- Improved hydrogen asset database
- Improved how DSR is modelled in Plexos
- Improved profiles for transport and heat
- Use of the recommended Seveth Carbon Budget analysis

For further information about out modelling tools, methods and assurance please see our *Modelling Methods 2025* document.

2. Emissions

Net greenhouse gas emissions

The emissions trajectories in our pathways are showing that, as the interim emissions targets get closer, they become increasingly more challenging.

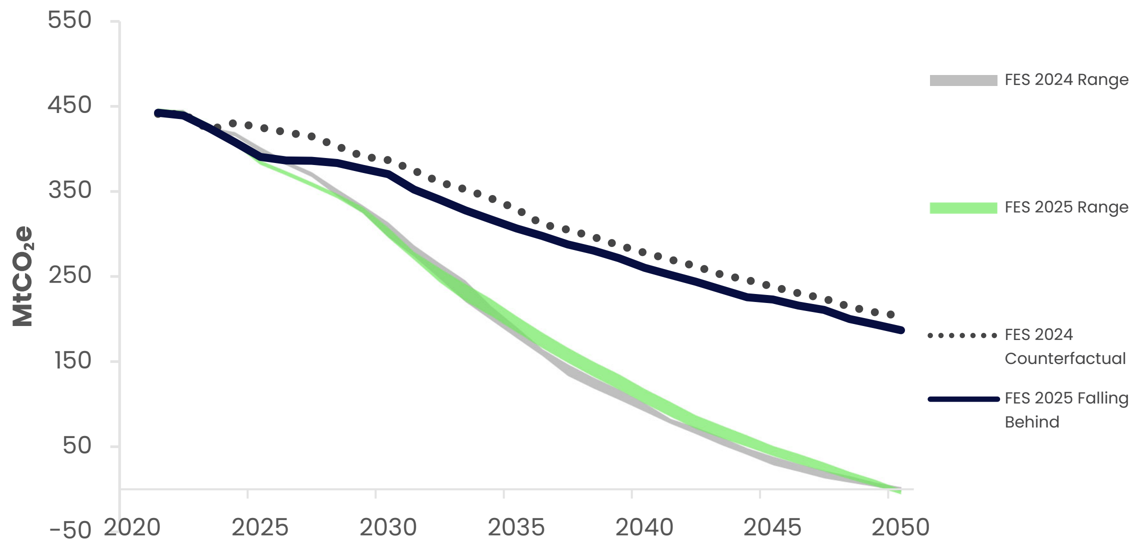


Figure 1: Net greenhouse gas emissions

Interim emissions targets

As with the *FES 2024* analysis, only Holistic Transition meets the 2030 NDC in *FES 2025*. It is also the only pathway to meet the 2035 NDC which was set after *FES 2024*.

A change this year is that not all pathways meet the interim carbon budgets. Holistic Transition and Electric Engagement meet all the carbon budgets, including the recommended Seventh Carbon Budget that was published after *FES 2024*. The Climate Change Committee (CCC) provided advice on the recommended level of the Seventh Carbon Budget (2038-42) in February 2025. Government will make a decision on the level at which to set the Seventh Carbon Budget by June 2026.

Hydrogen Evolution and Falling Behind only meet the Fourth and Fifth carbon budgets, which were set when the 2050 target was an 80% reduction in emissions relative to 1990 levels.

It is important to remember that our pathways explore a range of different choices and uncertainties on credible routes towards meeting net zero in 2050. Some choices across our pathways are where CO_2 infrastructure is focused towards bioenergy with carbon capture and storage (BECCS) for power or methane reformation for hydrogen production.

Uncertainty across our pathways is captured by a range in consumer engagement with demand flexibility and the level of data centre demand growth.

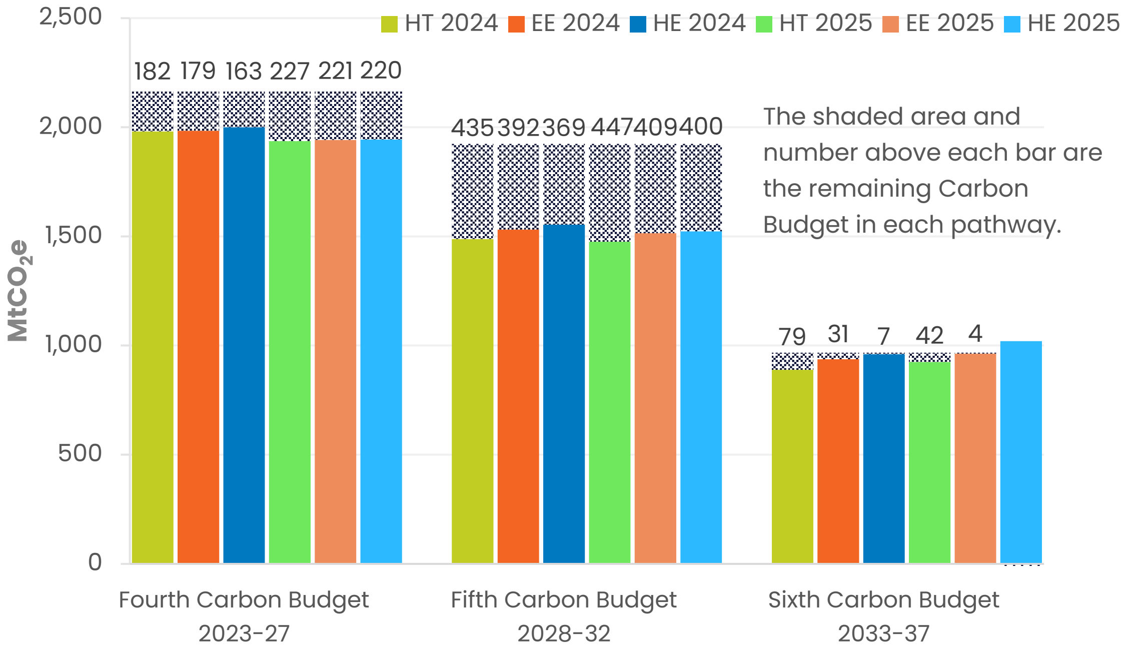


Figure 2: Emissions during carbon budget periods

Key differences in emissions between FES 2024 and FES 2025

Non-modelled sector emissions. In our pathways, we have assumed that sector emissions not modelled in FES are aligned with the CCC's recommended Seventh Carbon Budget analysis. The sectors not directly modelled are aviation, agriculture, shipping, land use, land-use change and forestry (LULUCF), waste, F-gases and BECCS for biofuels. In *FES 2024* these sectors used the Sixth Carbon Budget analysis.

One of the largest changes in the non-FES sectors is the updated projections for LULUCF. For *FES 2024* our LULUCF emissions was based on the Sixth Carbon Budget but was adjusted to reflect more recent short-term trends. By 2030 the *FES 2024* LULUCF emissions were 8 $MtCO_2e$ of absorption from this sector, whereas the Seventh Carbon Budget analysis has this sector as a net emitter until 2038. By 2050 the recommended Seventh Carbon Budget analysis now has 30 $MtCO_2e$ absorption from this LULUCF, which is higher than the Sixth Carbon Budget had at 21 $MtCO_2e$. This has impacted the short-term emissions while also ensuring the pathways do not have large quantities of net negative emission in 2050. The starting point for *FES 2025* is 9 $MtCO_2e$ lower in 2024 than *FES 2024*. This is due to the updated emissions for the non-FES sectors, alongside various small modelling updates within FES emissions calculations.

Direct air carbon capture and storage (DACCS). In *FES 2024* DACCS was used for engineered emission removals in all net zero pathways, where it reached between 5-15 $MtCO_2$ of removals in 2050. In *FES 2025,* only Hydrogen Evolution uses DACCS for engineered removed. This reaches 8 $MtCO_2$ in 2050, although this starts five years earlier in 2035 than any pathway had in *FES 2004*. All pathways now use direct air carbon capture to produce sustainable aviation and shipping fuel, in line with the recommended Seventh Carbon Budget.

Bioenergy with carbon capture and storage (BECCS). The level of emissions removals from BECCS has decreased for each pathway relative to the amount in *FES 2024*. The range has decreased from 36-46 $MtCO_2$ in *FES 2024* to 16-37 MtCO2 in *FES 2025*.

The reduction in both DACCS and BECCS requirements comes from fewer residual emissions and more negative emissions from other sectors in 2050 in our *FES 2025* analysis.

Key emissions statistics

			2030								2050							
		2024	FES 2024				FES 2025				FES 2024				FES 2025			
Sector	Units		HT	EE	HE	CF	HT	EE	HE	FB	HT	EE	HE	CF	HT	EE	HE	FB
Annual average carbon intensity of electricity excluding BECCS	g/ CO2ekWh	118	53	73	78	134	20	21	29	81	6	6	5	38	1	1	4	28
Net annual emission	MtCO2e	406	297	309	314	387	296	308	307	370	-1	-2	-1	204	-6	-2	0	187

3. Energy demand

Consumer demand for electricity, gas and hydrogen

Consumer demand has shifted more towards electrification from hydrogen in *FES 2025*. Additionally, greater population growth forecast and less optimistic views on energy efficiency improvements has lead to higher electricity demands across all pathways compared to *FES 2024*.

Out to 2030 electricity demand increases at a faster rate than it did in *FES 2024*. We have a common assumption across all pathways on the number of appliances per household to a central position. This has reduced the range, particularly in the short term, by increasing the lower appliance demand pathway, Holistic Transition. Other factors increasing 2030 electricity demand are greater electrification of industry and faster deployment of EV across all pathways.

After 2030 electricity demands continue to be higher than *FES 2024* values. Housing stock and population forecasts have increased. Where population growth for *FES 2025* has increased from 0.2 to 0.4% year-on-year, these factors mainly affect appliances, lighting, heating and transport demands.

Additionally, the pathways have now shifted to have greater use of electrification over hydrogen across all sectors and fewer efficiency improvements across many areas from appliances to heat pumps alongside more use of less efficient direct electric heating. By 2050 this results in the range increasing from 458-550 TWh in *FES 2024* to 540-646 TWh in *FES 2025*.

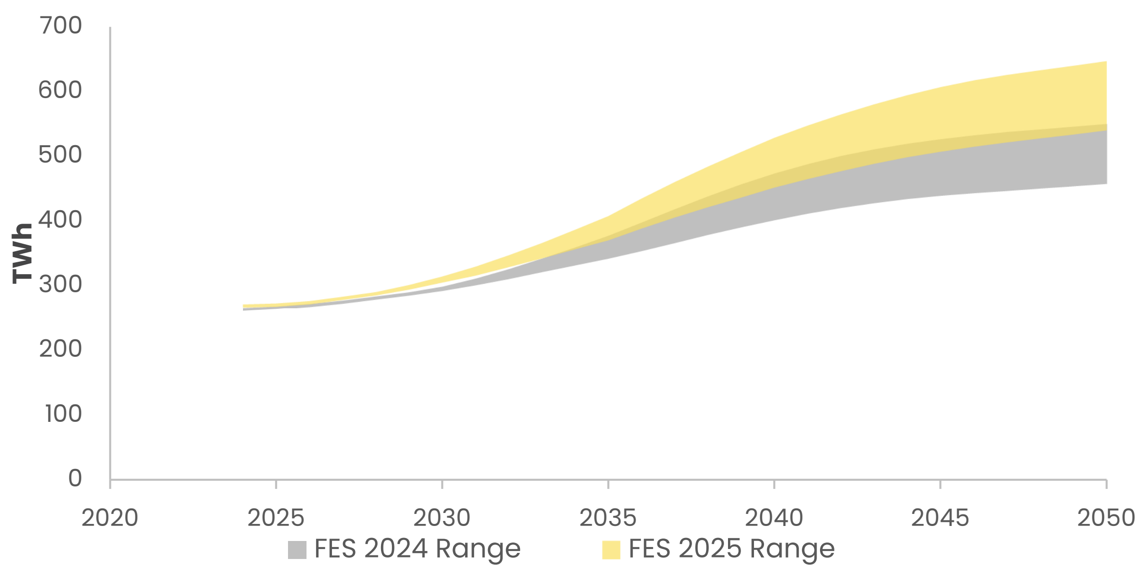


Figure 3: Consumer electricity demand across the pathways

Consumer demand for hydrogen. The ramp up in hydrogen demand has been delayed by one year in *FES 2025*: for industry from 2027 to 2028 and for heat from 2031 to 2032.

Alongside the delayed access for hydrogen in industry in *FES 2025* the absolute quantities have also reduced due to further confidence that more areas of industry would be suitable to be electrified instead of using hydrogen. The 2050 pathway range for hydrogen use in industry has decreased from 16-78 TWh to 11-47 TWh.

The option of hydrogen for heat in homes remains widespread in Hydrogen Evolution, until a UK Government decision is made where it would require a rapid rollout of a national hydrogen network before 2050, at which point the usage has slightly reduced for *FES 205* from 77 to 69 TWh. Holistic Transition no longer provides hydrogen access to homes. It now uses hydrogen strategically as a secondary fuel in district heating energy centres that are within industrial clusters to reduce peak electricity demand. As with *FES 2024* hydrogen is not used for space or hot water heating for Electric Engagement, our forecast or Falling Behind.

In both *FES 2024* and *FES 2025* road transport remains, with only the Hydrogen Evolution pathway having larger levels of hydrogen in Heavy Goods Vehicles (HGV). Following most stakeholder feedback, and recent progress on electric HGVs, this has reduced from 100% of HGVs greater than 26t used hydrogen in 2050 to 60%, bringing hydrogen demand in transport down from 51 to 31 TWh in Hydrogen Evolution.

Overall consumer demand for hydrogen in 2050 has reduced from 20-223 TWh to 14-179 TWh in the pathways.

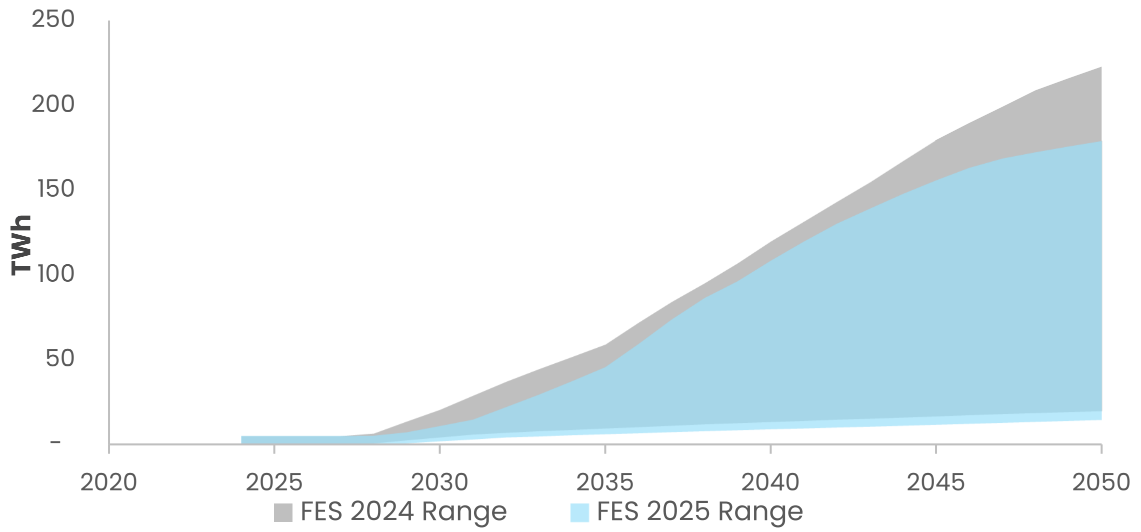


Figure 4: Consumer hydrogen demand across the pathways

Consumer demand for gas. Heating demands are the main driver for consumer gas demands and the changes in gas demands from *FES 2024* to *FES 2025*.

Recent data has shown that gas demand suppression from the energy crisis was higher than previously estimated. It is now thought to have been 18% suppression in 2023. In *FES 2024* Holistic Transition and Electric Engagement assumed some consumers kept thermostats turned down in the long term to reduce their impact on the environment. Analysis has also shown, however, that the actual demand suppression reduced by a third in 2024 to 12%. For *FES 2025,* in line with the recent trends, all demand supression is tapered off by 2029. This flattens out the gas demand trends out to 2030.

FES 2025 retains a full gas boiler phase out in 2035. However, the Future Homes Standard delay alongside a slower ramp up of low carbon heating until 2035 all knock onto higher gas demands by 2035.

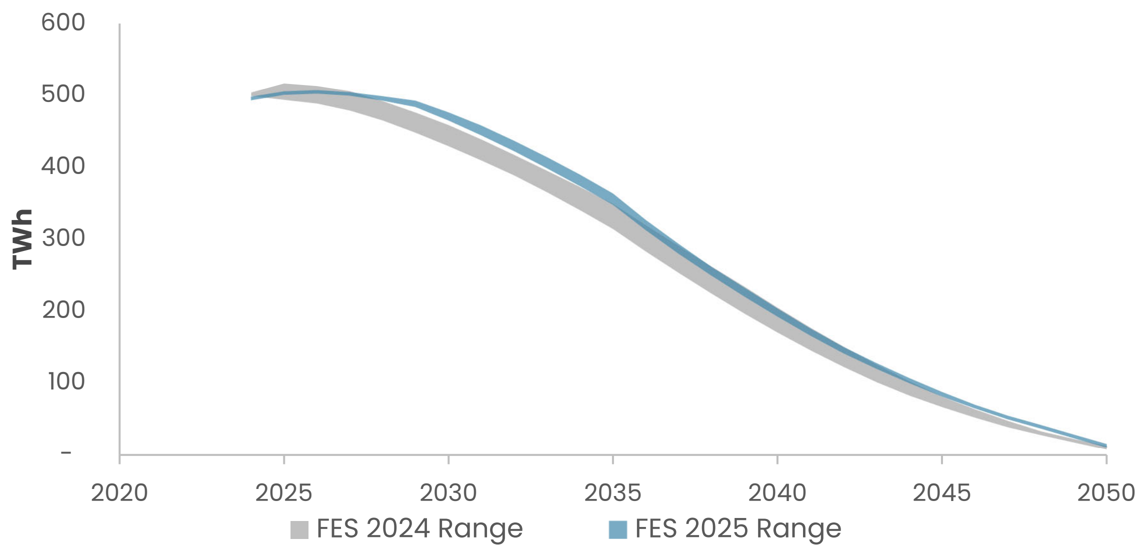


Figure 5: Consumer gas demand across the pathways

Changes in 2035 consumer demand. In line with the trends above, consumer demand by 2035 has shifted more towards electrification than hydrogen. Electricity demands have increased from 343-378 TWh in *FES 2024* to 370-408 TWh in *FES 2025* in 2035. Although hydrogen demand range has decreased, it still has the biggest range. This underlines the uncertainty that remains, as it decreases from 11-60 TWh to 7-48 TWh in 2035. Gas demand range has significantly decreased now there is a common assumption on demand suppression from behavioural changes. In 2035 it has increased from 314-349 TWh to 348-363 TWh. Oil demand has decreased to follow the faster switch away from petrol and diesel in transport.

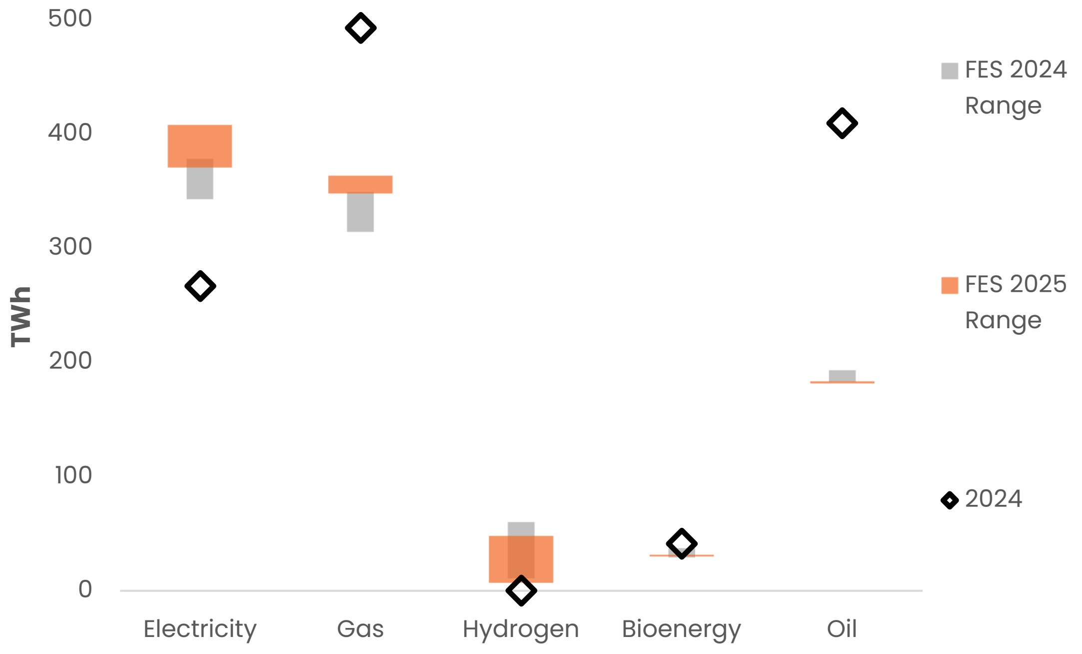


Figure 6: Consumer demand for all fuels across the pathways in 2035

Road transport. For *FES 2025* electric vehicle (EV) uptake has increased and this is now 100% of new car sales in 2030, five years earlier than *FES 2024*. This is to balance the most credible way of reducing emissions in the short term, as we are beginning to see cost parity in EVs while other sectors are proving more challenging. Longer-term increases are from the higher population forecasts in *FES 2025*. Long-term assumptions remain the same around changes in vehicle usage from autonomous vehicles, car sharing, public and active transport.

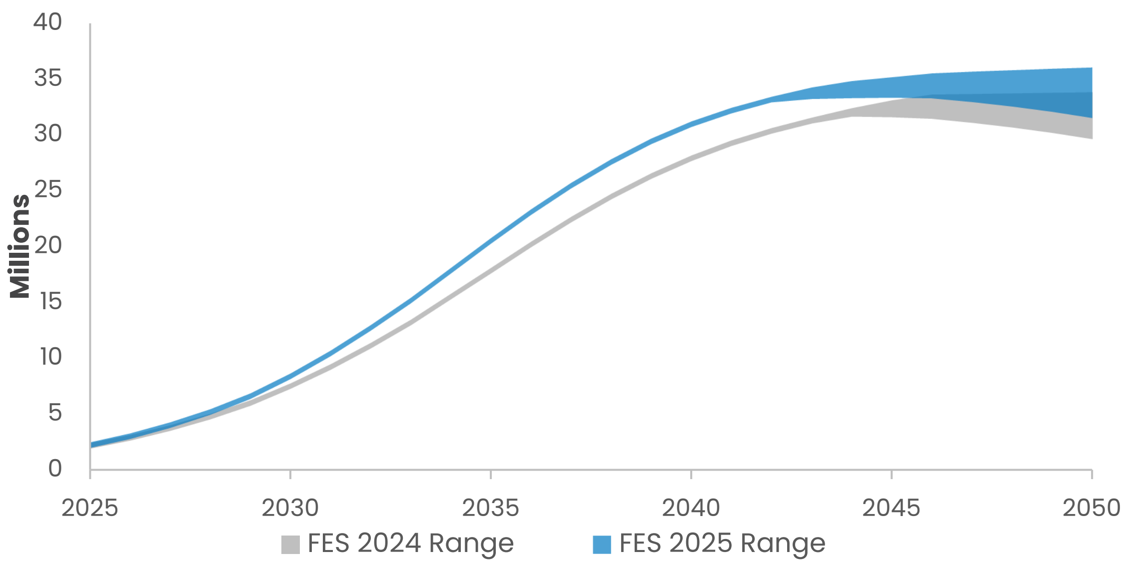


Figure 7: Electric cars across the pathways

Residential heating. Although 2024 saw a 56% increase in heat pump sales compared to 2023, this was around half the number of sales in *FES 2024*'s Holistic Transition and Electric Engagement pathways for the same year. Therefore, *FES 2025* has slowed down the ramp up of heat pump installations. This leads to lower heat pump stock until the late 2040s. After this point *FES 2025* has more heat pumps from greater housing stock forecasts and less use of hydrogen and biofuel boilers.

Alongside the changes in the number of heat pumps, the efficiency projections of heat pumps have also decreased for *FES 2025* based on stakeholder feedback. Holistic Transition reduces the Seasonal Coefficient of Performance from 3.8 to 3.5 and Electric Engagement and Hydrogen Evolution reduce from 3.4 to 3.1. *FES 2025* also increases the share of direct electric heating systems, in line with findings from a Public First and NESO *Decarbonising Heat: Consumer Choice and Affordability* survey. All these changes lead to increasing electricity demand.

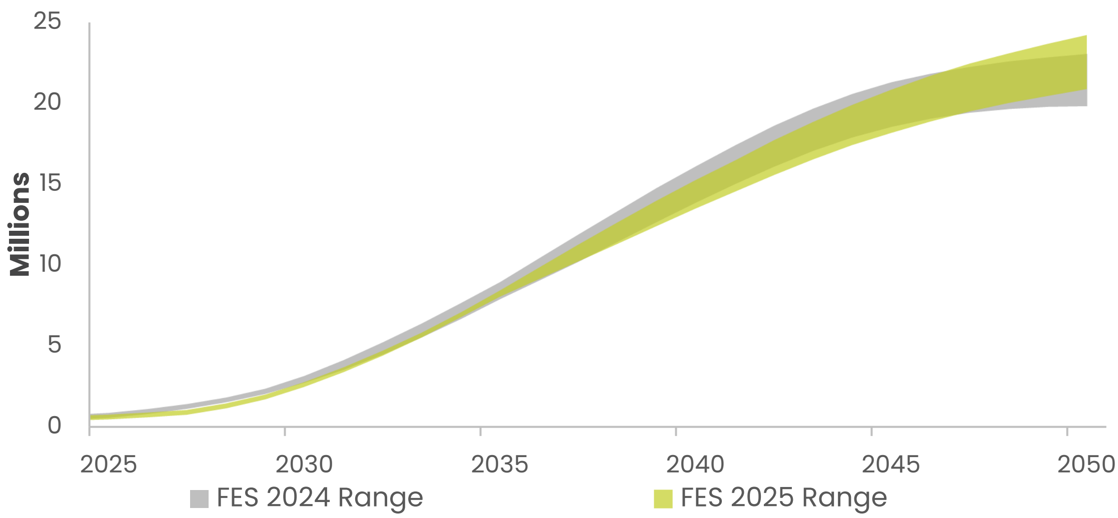


Figure 8: Residential heat pump stock across the pathways

Industry and commercial electricity demand. Industry has greater use of electrification over hydrogen as developments in high temperature heat pumps electric boilers and thermal storage are increasing the likelihood of electrification for more industry sectors. This leads to the 2050 range increasing from 86-117 TWh to 91-131 TWh.

Increased demand for the commercial sector is in line with the heat changes alongside higher long-term forecasts in data centre growth from 54-62 TWh in the pathways in 2050 to 51-71 TWh in *FES 2025*. Overall electricity demand from industry and commercial sectors, excluding electrolysis, has increased from 212-276 TWh to 262-329 TWh in 2050.

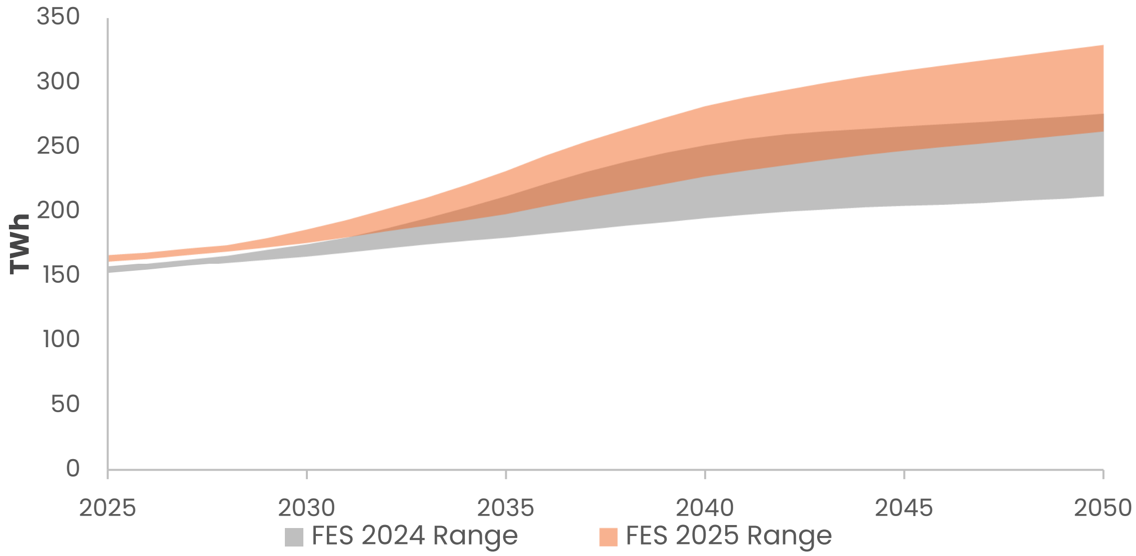


Figure 9: Industry and commercial electricity demand, excluding electrolysis across the pathways

Demand flexibility. There are many changes in *FES 2025* relative to *FES 2024* for demand flexibility. Many of these counter each other, leading to a smaller net increase in demand flexibility by 2050. Demand flexibility from residential appliances and industry and commercial remains comparable in *FES 2025* and *FES 2024* although with a slight shift towards greater share from residential.

For EVs, *FES 2025* uses an updated unmanaged residential charging profile, which is a profile that shows what peak demand would be if charging started straight away when consumers plug in their car. This updated profile shows longer charging periods, due to increased battery sizes, leading to less frequent charging and less peak demand even with unmanaged charging. This has a positive effect of reducing peak demand, even if it does show that there is less flexibility available from smart charging, down from 16 GW to 10 GW in 2050 in Holistic Transition. Vehicle to Grid (V2G) for *FES 2024* was only used with private cars at residential chargers. For *FES 2025* V2G has also been incorporated with commercial vehicles, increasing the capacity from 32 to 41 GW in Holistic Transition in 2050.

Flexibility from heat has a net increase in *FES 2025*. Heat flexibility from storage heaters has risen in 2050 from 6 GW in all pathways in *FES 2024* to 7-15 GW in 2050. This is due to increased use of direct electric heating systems in *FES 2025*. *FES 2024* modelled flexibility from heat pumps solely using thermal storage, achieving 4-6 GW of flexibility in 2050. Based on stakeholder feedback, *FES 2025* models heat pump flexibility from pre-heating homes before the evening peak. This increased flexibility from heat pumps up to 4-7 GW.

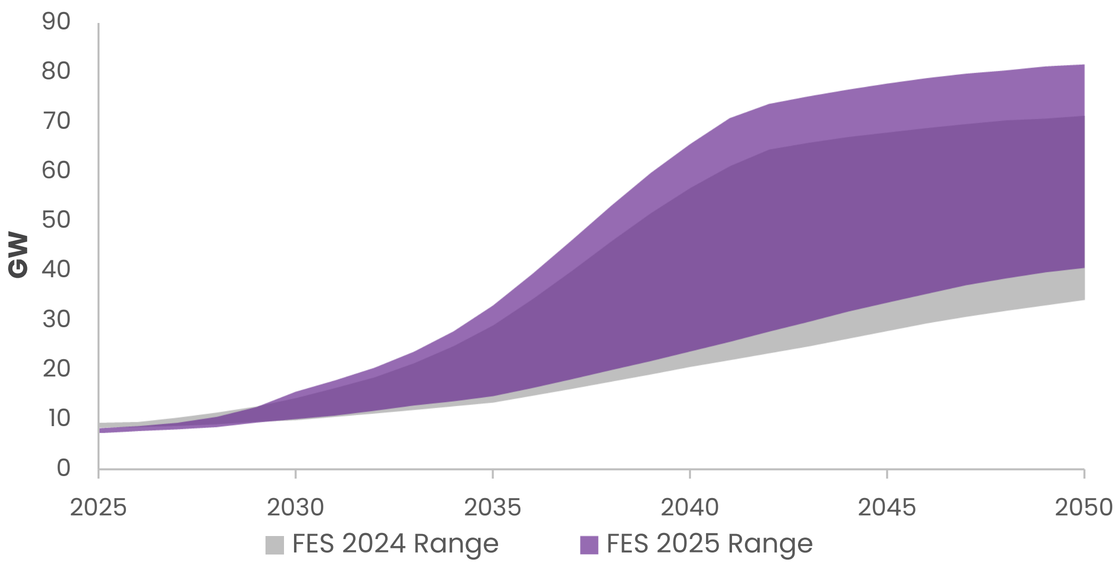


Figure 10: Demand flexibility across the pathways

Key consumer demand statistics

TWh		2024	2030								2050							
			FES 2024				FES 2025				FES 2024				FES 2025			
Sector	Fuel		HT	EE	HE	CF	HT	EE	HE	FB	HT	EE	HE	CF	HT	EE	HE	FB
Transport	Electricity	6	28	28	27	22	32	32	31	22	122	127	101	121	126	132	117	122
Appliances	Electricity	75	59	61	63	66	62	64	64	67	45	57	58	69	53	60	60	69
Residential Heat	Electricity	21	24	24	25	23	25	26	26	24	75	78	74	60	94	121	96	66
	Hydrogen	0	0	0	0	0	0	0	0	0	15	0	77	0	1	0	69	0
Commercial	Electricity	86	100	97	91	87	99	101	97	96	161	160	142	121	184	198	171	138
	Hydrogen	0	1	0	1	0	1	0	1	0	6	2	18	0	4	2	31	0
Industrial	Electricity	74	75	78	75	77	85	85	78	80	86	117	71	91	105	131	91	99
	Hydrogen	0	14	4	20	1	7	1	10	0	49	16	78	17	30	11	47	17

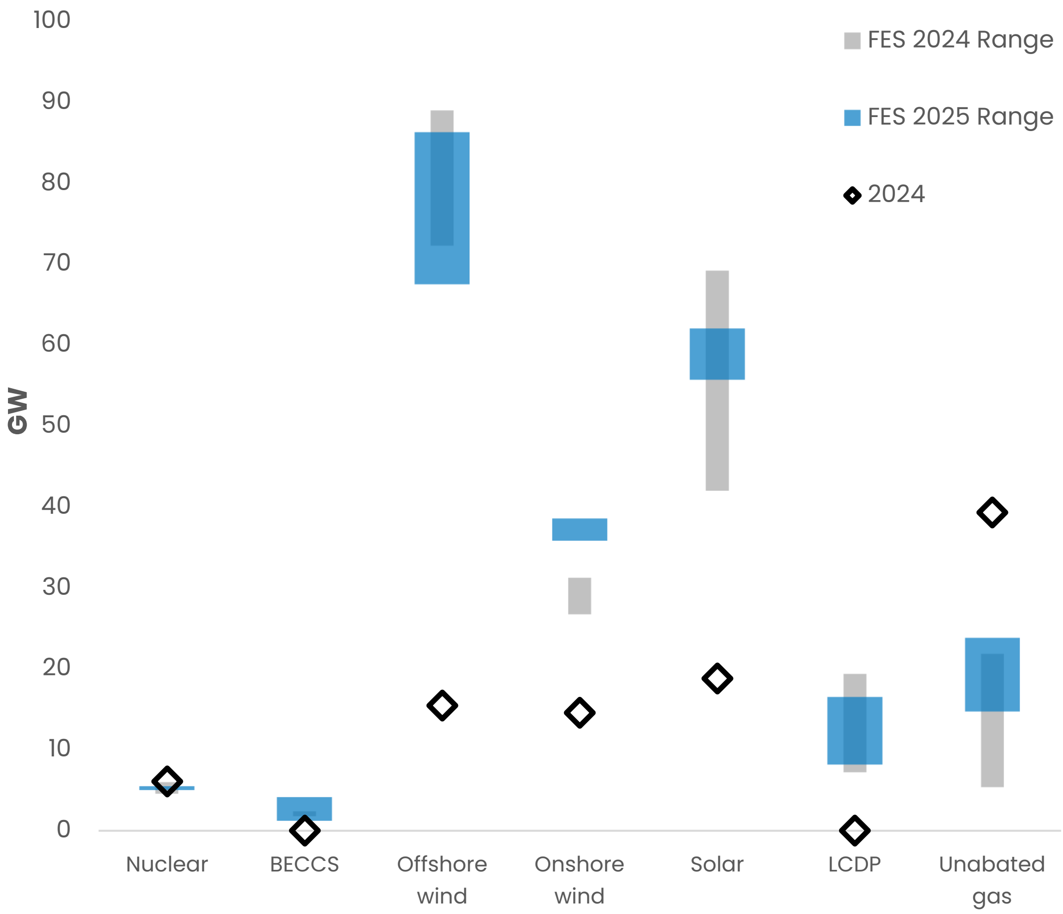
4. Energy Supply

Electricity generation capacity

The direction set by the government's *Clean Power 2030 Action Plan* and proposals for connection reform reduce the range in generation capacities in the short term. Increased demand drives higher capacities in the long term.

FES 2025 now uses 2030 as the last year of assessing the installation capacities based off pipelines, market knowledge and research, with 2031 now the first year where our capacity expansion module optimises the generation build out.

To ensure the capacities are kept within sensible limits based on parameters not captured in the model such as land constraints, grid constraints and policy ambition minimum and maximum build rate constraints are set. Minimum build rates are set for nuclear and offshore wind, whereas maximum build rates are set for onshore wind and solar.



LCDP - Low Carbon Dispatchable Power

Figure 11: Installed generation capacities across the pathways in 2035

Nuclear capacities across the pathways remain at various levels around 2030 in *FES 2025* from the uncertainty of when the current fleet will retire and when new plants will come online. *FES 2024*'s Electric Engagement was at the upper edge of achievable capacity in 2050. Despite increasing demands in *FES 2025*, that would preference higher baseload, the overall nuclear capacities remain very similar in *FES 2025* due to limitations on expected build out rates for large and smaller scale reactors.

BECCS. The range of growth in BECCS by 2035 has widened in *FES 2025* from 1.8-2.4 GW to 1.2-4.2 GW. These values remain constant in *FES 2025* until 2050, exploring lower values compared to *FES 2024* that had 3.4-4.7 GW in 2050. Hydrogen Evolution is now the lower pathway for BECCS in 2050, whereas in *FES 2024* it was Holistic Transition. Hydrogen Evolution is now lower to show the choices in using more DACCS instead of BECCS to meet net zero in 2050. However, due to later deployment of DACCS than BECCS, this has made near-term targets more challenging for Hydrogen Evolution.

Wind. In 2035 offshore wind has lower capacities compared to *FES 2024* from 72-88 GW down to 68-86 GW. This is from stakeholder feedback that *FES 2024* values in the short term would have been challenging to achieve. Contrary to this, onshore wind capacities have increased in 2035 from 27-32 GW up to 36-39 GW as planning requirements for onshore wind were eased. 2050 offshore wind values remain similar to *FES 2024* values, whereas onshore wind has increased 9 GW generating 28 TWh more electricity on average across the pathways.

Solar range in 2035 has significantly narrowed with faster growth and increased clarity over the next few years following connections reform changes around co-locating assets, leading to capacities increasing from 42-69 GW to 56-62 GW in 2035. By 2050, *FES 2025* solar is inside the range of *FES 2024*, increasing its minimum capacity in Hydrogen Evolution from 72 GW to 87 GW.

Energy Storage. Battery growth has increased in the medium and long term from 29-36 GW to 31-40 GW in 2050. In getting to these higher long-term capacities, the growth rate is more progressive than *FES 2024*, which leads to lower average battery capacities across the pathways before 2032 in *FES 2025*.

Long-duration energy storage (LDES) sees slower maximum levels of deployment by 2030 as the range is reduced from 3.7-5.9 GW to 3-5.3 GW, due to the long lead and planning times and capital expenditure. However, the value of LDES for the energy system remains, as by 2050 the range increases from 12-15 GW to 13-17 GW.

Electric Engagement has become that highest capacity pathway for batteries (and for LDES by 2050), taking over from Holistic Transition in *FES 2024*. This is to better show the different choices where Holistic Transition has higher levels of demand flexibility.

Interconnectors. Interconnector projections remain comparable. In *FES 2025*, the main change in line with energy storage is that Electric Engagement becomes the pathway with the highest capacity. Capacities in 2030 remain the same and, by 2035, the range has narrowed from 17-24 GW to 19-21 GW. The *FES 2025* capacity ranges remain narrower in 2050 as they are updated from 17-25 GW to 18-24 GW.

We have updated our European data in *FES 2025* to closer align scenarios in Europe with the framework of our pathways in FES. This is also in line with each EU state achieving net zero in 2050. This has led to increased imports and reduced exports for *FES 2025*. Net flows in 2050 across the pathways have changed from -73 to -15 TWh in *FES 2024* to -18 to 27 TWh in *FES 2025*, where negative is a net exporter and positive is a net importer. Hydrogen Evolution is now a net importer of electricity in *FES 2025*, due to it having the highest level of electricity demand including electrolysis and lowest level of renewable plus base load generation, both of which lead to less exports.

Dispatchable generation. Following NESO's net zero adequacy analysis, the firm capacity has increased in all *FES 2025* pathways and Falling Behind to ensure security of supply during more extreme weather patterns than modelled by FES, as FES focuses on an average weather year. An effective way to achieve this firm capacity is through dispatchable power, which will have low load factors. This leads to *FES 2025* maintaining higher quantities of all types of dispatchable power compared to *FES 2024.*

Within low carbon dispatchable power (LCDP) we include hydrogen to power and gas with carbon capture and storage (CCS). The range in LCDP narrows in 2035 in *FES 2025*. As research and stakeholder engagement showed the pace of deployment of hydrogen to power in *FES 2024* would be challenging to achieve, leading to capacities reduced from 4-18 GW to 1-7 GW in the pathways in 2035. However, this is partially countered by faster growth in gas with CCS that increased from the pathways having 2-8 GW in *FES 2024* to 7-9 GW in *FES 2025* in 2035.

Longer-term trends have a small shift away from hydrogen to power having on average 68% of the LCDP capacity in 2050 in *FES 2024* to having 53% in *FES 2025*, while retaining gas CCS generating double the quantity of hydrogen to power. This results with the total LCDP capacities in 2050 narrowing in from 29-56 GW to 48-55 GW.

By 2035 unabated gas capacity has not reduced as much in *FES 2025* as it did in *FES 2024*, especially for Holistic Transition that increased from 5 GW to 15 GW. In 2050, when net zero is achieved in the pathways, although there is no remaining unabated gas capacity in Holistic Transition there remains 6 GW in Electric Engagement and 11 GW in Hydrogen Evolution in *FES 2025*, where no pathways had any capacity in 2050 in *FES 2024*. This capacity is required for security of supply but is rarely used and any emissions are offset from other sectors.

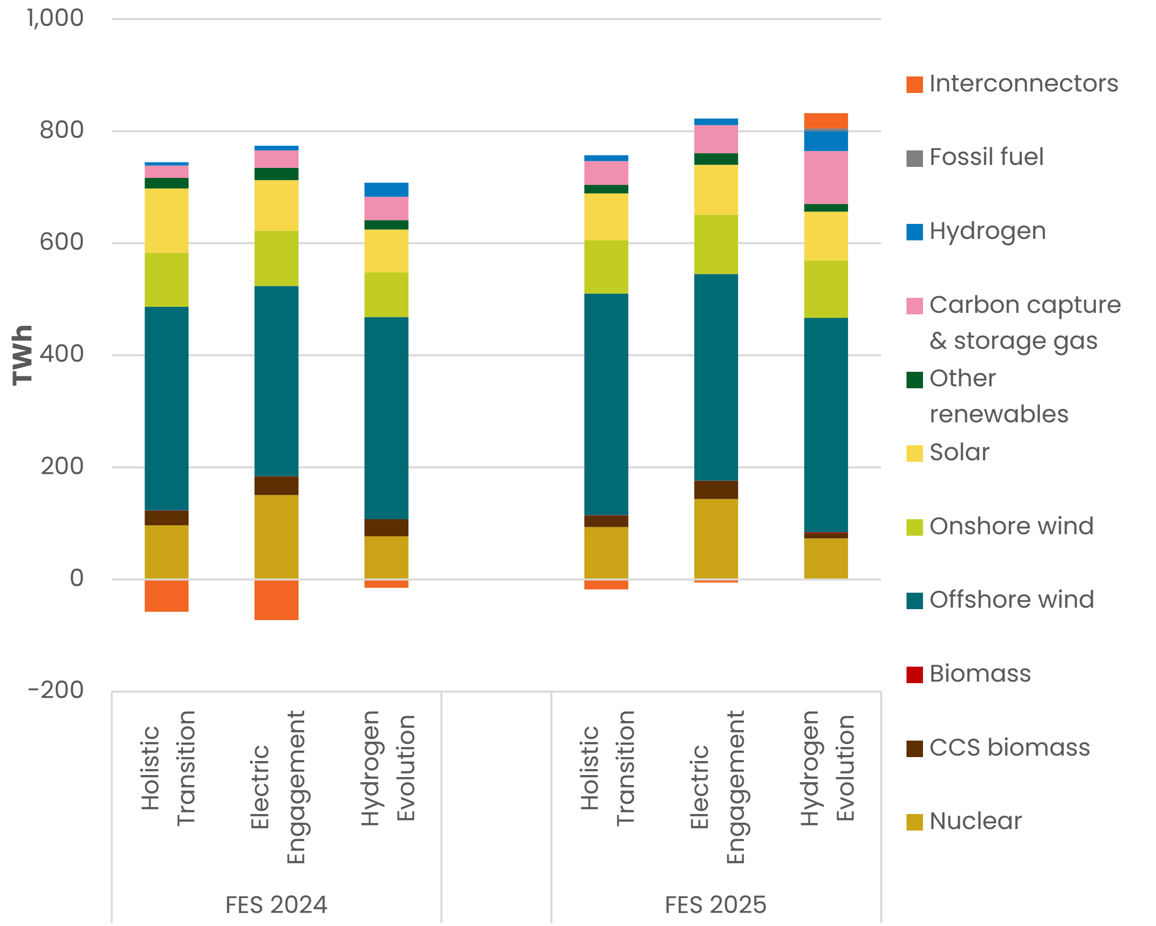


Figure 12: Electricity generation output across the pathways in 2050

Hydrogen production

Hydrogen production across all pathways has reduced due to less demand from the FES modelled consumer demand sectors and the non-FES shipping and aviation sectors taken from the recommended Seventh Carbon Budget analysis. Our analysis remains, assuming no imports or exports of hydrogen for *FES 2025* due to uncertainty in this field. Production remains primarily from networked electrolysis and methane reformation with CCS, alongside smaller roles for biomass gasification and nuclear electrolysis.

The capacities from hydrogen production facilities reduce from a total of 35-75 GW to 19-58 GW in 2050. The share of hydrogen production capacities from electrolysis slightly reduces from an average of 80% of all hydrogen production capacity being electrolysis in *FES 2024* to 76% in *FES 2025* in 2050. The share of hydrogen produced from electrolysis is comparable going from 61% to 63% in 2050. The difference between the production and capacity percentages are due to lower load factors for electrolysis as it operates with some flexibility. However, the changes in *FES 2025* demonstrate slightly less flexibility from electrolysers, down to the higher capital cost projections for electrolysers used in *FES 2025*.

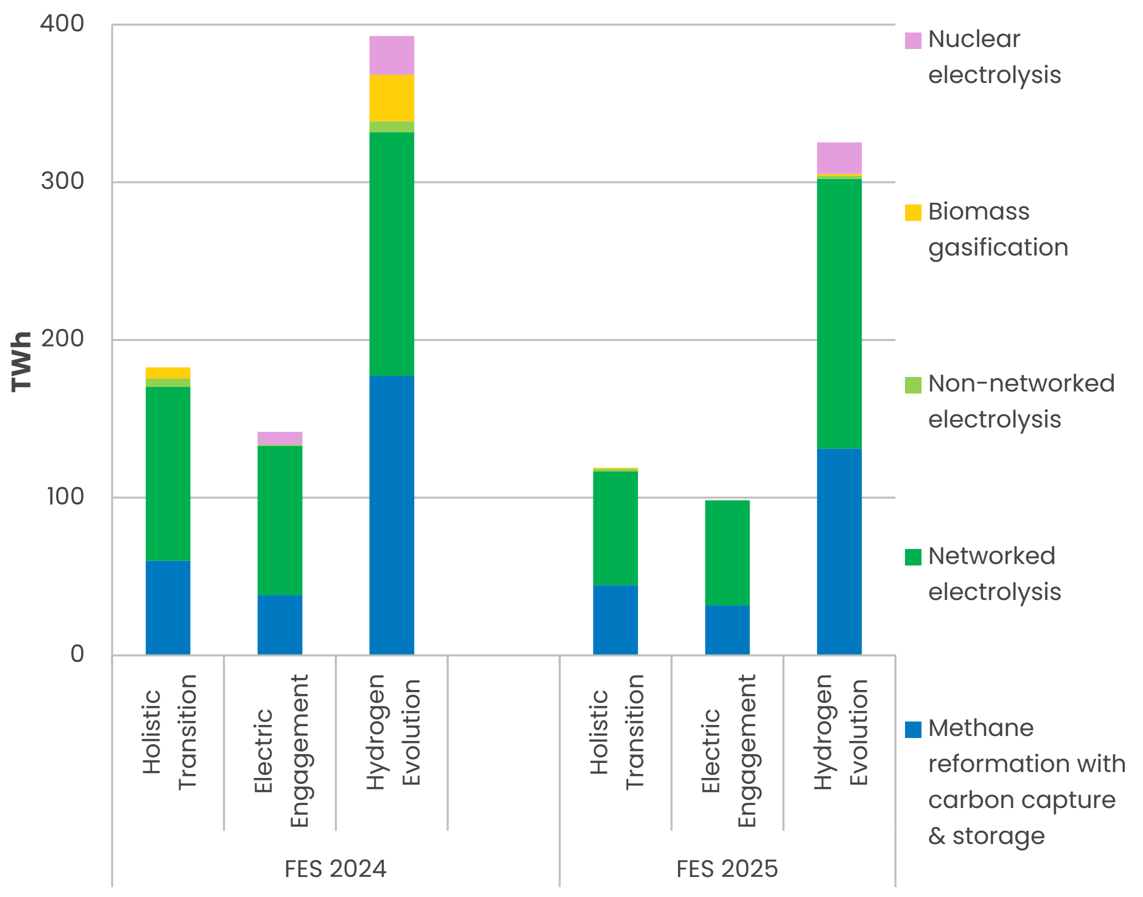


Figure 13: Hydrogen production across the pathways in 2050

Hydrogen storage. In line with reduced hydrogen demand and production, hydrogen storage has reduced for *FES 2025*. In 2050 the hydrogen storage capacity has decreased from a range of 14-49 TWh in *FES 2024* to 10-39 TWh in *FES 2025*.

Key electricity supply statistics

			2030								2050							
		2024	FES 2024				FES 2025				FES 2024				FES 2025			
Sector	Units		HT	EE	HE	CF	HT	EE	HE	FB	HT	EE	HE	CF	HT	EE	HE	FB
Electricity																		
Peak demand	GW	58	62	65	64	64	62	65	64	63	109	119	104	102	120	144	122	107
Total installed capacity	GW	125	219	205	191	166	210	215	199	185	411	386	343	285	439	450	384	314
Wind and solar capacity	GW	49	121	106	94	71	123	124	113	89	249	225	197	152	248	248	226	180
Interconnector capacity	GW	10	12	12	12	12	12	12	12	12	25	22	17	16	22	24	18	17
Total storage capacity	GW	10	34	29	26	22	30	30	24	23	83	66	50	34	96	81	56	35
Total storage capacity	GWh	63	130	92	86	63	101	82	67	63	269	258	208	132	285	295	230	235
Vehicle-to-grid max capacity	GW	0	2	1	0	0	2	1	0	0	65	40	19	8	81	49	23	9
Natural Gas																		
Annual demand	TWh	743	642	649	724	790	609	605	650	771	138	127	303	636	168	166	398	640
1-in-20 peak demand	GWh/day	5214	3811	4327	4726	5352	4544	4613	4654	5537	1023	1136	1791	4593	1382	1671	2603	4707
Imports	TWh	448	430	446	510	586	429	446	443	549	113	105	279	581	92	155	323	580
Hydrogen																		
CCS enabled hydrogen production	TWh	0	26	4	42	0	6	0	8	0	60	38	177	8	45	32	131	5
Electrolysed hydrogen production	TWh	0	12	5	14	1	3	3	3	0	116	95	161	17	74	67	173	12
Bioresources																		
Bioresources demand	TWh	157	151	139	149	102	165	140	164	145	191	204	225	91	211	184	171	113

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For the purpose of this document, the terms "NESO", "we", "our", "us" etc. are used to refer to National Energy System Operator Limited (company number 11014226).

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