UK Government

Energy Trends

UK, July to September 2025

About this release

Information on energy production, trade, and consumption in the UK for total energy and by specific fuels.

In this release

Data tables

Additional data are available online as part of the Energy Trends series:

Total energy
Coal and derived gases
Oil and oil products
Gas
Electricity
Renewables

This publication is based on a snapshot of survey data from energy suppliers. New data are incorporated in line with the revisions policy.

Percentage change from Quarter 3 2024, primary energy basis

(Mtoe basis)	Production	Imports	Exports	Demand
Total energy	**-2.5%**	**-3.3%**	**-2.2%**	**-3.8%**
Coal	**-0.8%**	**-32%**	**-48%**	**-46%**
Primary oil	**+2.7%**	**-2.3%**	**-0.5%**	**-2.6%**
Petroleum products	**-2.0%**	**-0.8%**	**-5.9%**	**-3.7%**
Gas	**-1.2%**	**-10%**	**+0.7%**	**-1.7%**
Electricity	**-11%**	**+6.8%**	**+27%**	**-11%**

Total UK energy production in the third quarter of 2025 was at a record low, down 2 per cent on the third quarter last year, driven in the main by a drop in nuclear output due to maintenance outages and refuelling. Total energy production is 28 per cent below the pre-pandemic level recorded in the third quarter of 2019, mainly as a result of continued falls in oil and gas output from the UK's Continental Shelf.

Renewable electricity generation grew 7 per cent on the same period last year, following strong output from wind and solar. As a share of total generation, renewable electricity generation increased to 54.7 per cent, 3.6 percentage points up on the same period last year and just shy of the record share seen in the second quarter of this year.

The fall in nuclear output offset the increase in renewables and resulted in **the low carbon share of generation dropping 1.4 percentage points to 67.2 per cent**. Fossil fuel electricity generation (almost exclusively gas) increased 7 per cent and reached a share of 29.5 per cent.

Final energy consumption by households and transport was broadly stable on the same period last year. Transport demand was down 2 per cent on the third quarter of 2024 with falls in road and aviation fuels. Household demand was static, once adjustments have been made for the warmer weather experienced this year. **Energy demand from industrial users dropped to a new record low**, despite manufacturing output remaining above pre-pandemic levels. Improvements in energy efficiency and a move away from traditional manufacturing have impacted the long-term trends in industrial consumption.

Fossil fuel dependency increased to 72.6 per cent from 72.1 per cent following increased gas demand for electricity generation.

Net import dependency decreased from 42.4 per cent to 42.0 per cent, with relatively little difference in trade patterns compared to the third quarter of 2024.

Section 1: UK total energy

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Key headlines

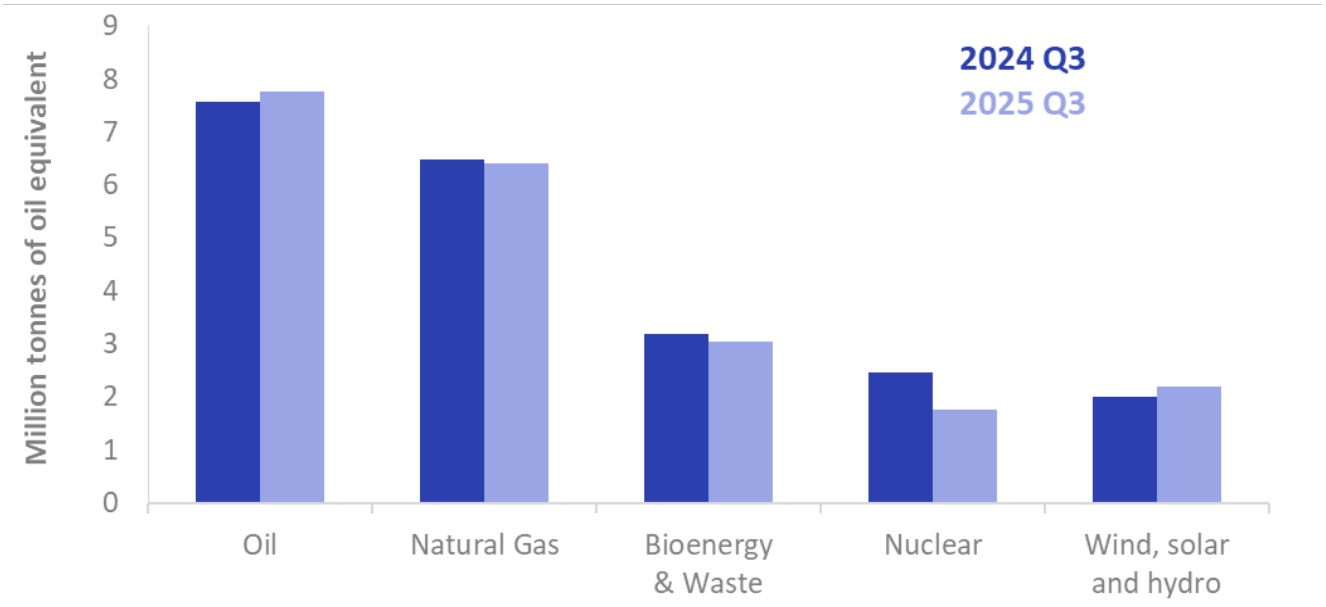
In the third quarter of 2025 **total production was 21.2 million tonnes of oil equivalent, 2.5 per cent lower** compared to the third quarter of 2024 and at the lowest quarterly total this century. Oil and gas production rose marginally on last year, but both remain significantly below pre-pandemic levels. Low carbon output fell by 8.4 per cent as a result of record low nuclear output due to refuelling and continued outages.

Total primary energy consumption for energy uses fell by 3.6 per cent, with record low quarterly demand from nuclear generators the main driver for the fall in consumption. When adjusted to take account of weather differences, primary energy consumption fell by 3.4 per cent on the same period last year.

Total final energy consumption (excluding non-energy use) was 2.6 per cent lower compared to the third quarter of 2024. Domestic consumption fell by 4.6 per cent with July and August 2025 notably warmer than a year earlier, whilst services consumption rose by 0.3 per cent. Despite manufacturing output remaining above pre-pandemic levels, industrial consumption fell by 5.4 per cent to the lowest quarterly total this century. Transport consumption fell by 1.9 per cent with petrol, jet and diesel all falling on the same period last year. On a seasonally and temperature adjusted basis, final energy consumption fell by 1.4 per cent, with rises in domestic and services but falls in industry and transport consumption.

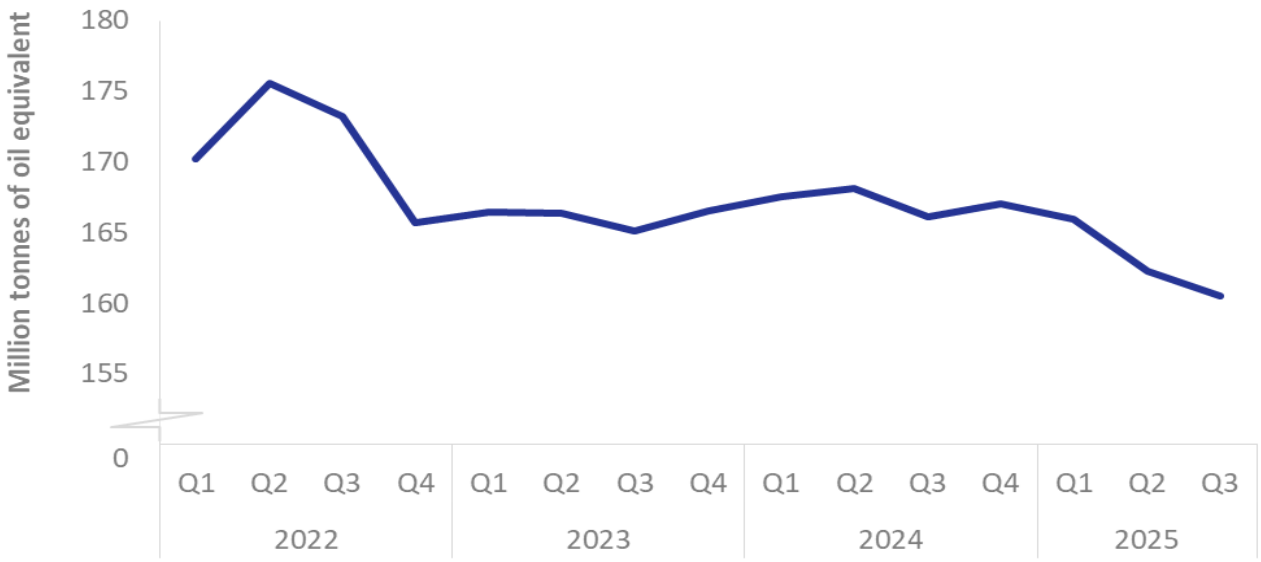
In the third quarter of 2025 **dependency on fossil fuels** was 72.6 per cent, up 0.5 percentage points on the same quarter of 2024. The **low carbon share** was 23.6 per cent in the third quarter of 2025, down 0.7 percentage points on the same quarter of 2024, due to the fall in nuclear output.

Chart 1.1 UK production (Energy Trends Tables 1.1 & 1.3)



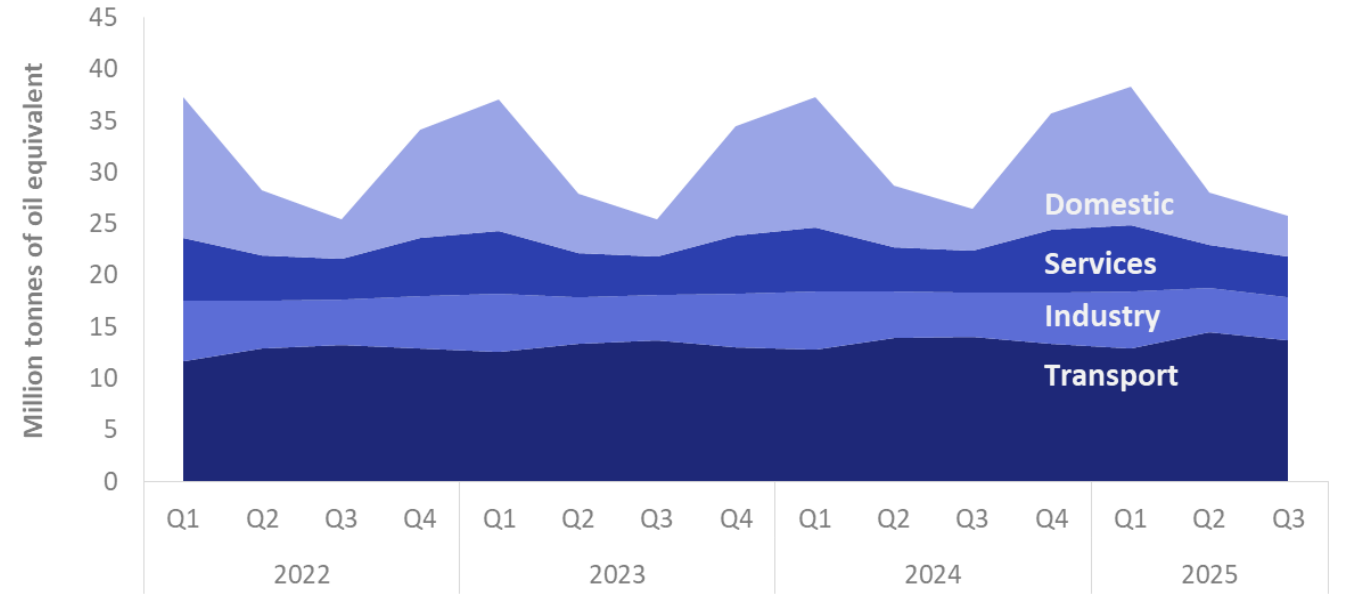
In the third quarter of 2025 **total production was 21.2 million tonnes of oil equivalent, 2.5 per cent lower** than in the third quarter of 2024 and at a record low level. Oil production rose by 2.6 per cent but output is still 43 per cent lower compared to pre-pandemic levels, whilst gas production fell by 1.4 per cent and is 23 per cent lower than pre-pandemic levels. Nuclear production fell by 28 per cent to a record low quarterly level due to refuelling on top of continued outages. Wind, solar and hydro output rose by 10 per cent due to more favourable weather conditions for solar and increased capacity for both wind and solar.

Chart 1.2 Total inland consumption (primary fuel input basis) (Energy Trends Table 1.2)



In the third quarter of 2025 total inland consumption over the last year (including not only fuel used by consumers, but for electricity generation and other transformation) was 160.5 million tonnes of oil equivalent, 3.4 per cent lower than in the third quarter of 2024. (Chart 1.2 is on a seasonally adjusted and annualised rate that removes the impact of temperature on demand.)

Chart 1.3 Final energy consumption by user (Energy Trends Table 1.3)



In the third quarter of 2025 **total final energy consumption (excluding non-energy use) was 2.6 per cent lower** than in the third quarter of 2024. Average temperatures were 1.0 degrees Celsius higher than the same period a year earlier, resulting in domestic consumption falling by 4.6 per cent whilst consumption by other final users rose by 0.3 per cent. **Industrial consumption dropped to a new record low,** despite manufacturing output remaining above pre-pandemic levels. Improvements in energy efficiency and a move away from traditional manufacturing have impacted the long-term trends in industrial consumption. Transport consumption decreased by 1.9 per cent on the same period last year, with small falls in petrol, diesel and jet fuels.

Section 2: Coal and derived gases

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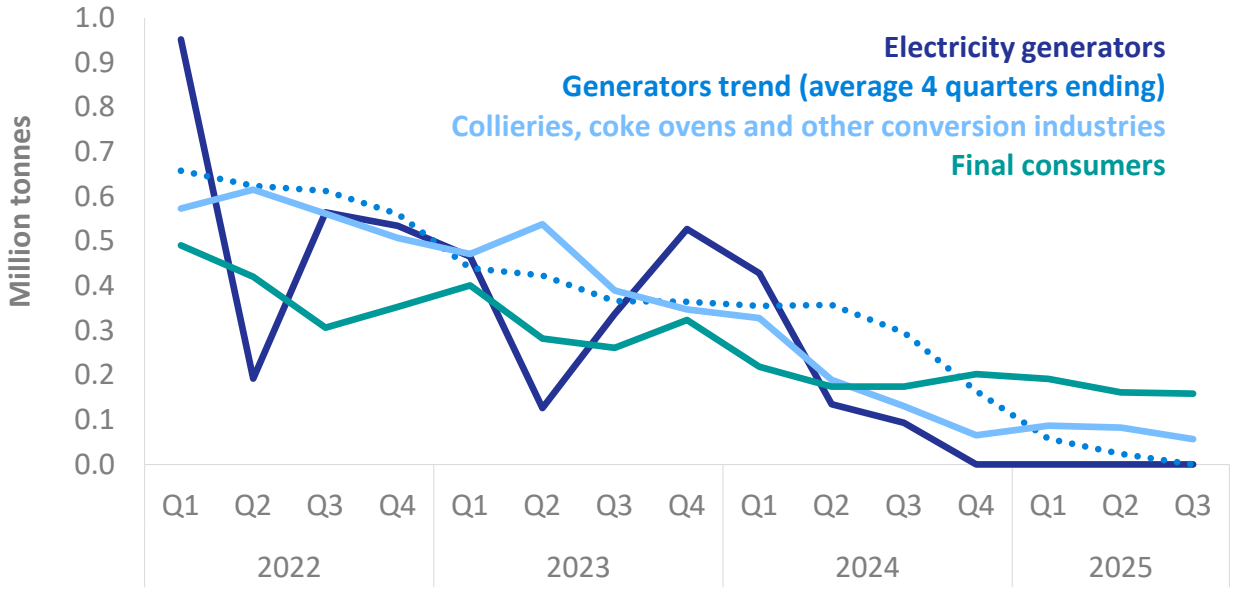
Key headlines

In the third quarter of 2025, UK coal demand fell to a record low of 215 thousand tonnes, 46 per cent lower than in Quarter 3 2024. There was no coal-fired power station generation and there was no coke oven gas production as the remaining coke ovens in the UK have now closed.

Overall coal production fell to 30 thousand tonnes, down 0.8 per cent on the third quarter of 2024. This was all deep-mined coal as the last large surface mine Ffos-Y-Fran closed at the end of November 2023. Coal production in the UK is now a small component of the UK's total energy production.

Coal imports fell to 422 thousand tonnes during the quarter, 34 per cent down on the same period last year. South Africa was the largest supplier of coal into the UK at 35 per cent of total imports. This was followed by the European Union (27 per cent) and the USA (21 per cent). (Chart 2.3)

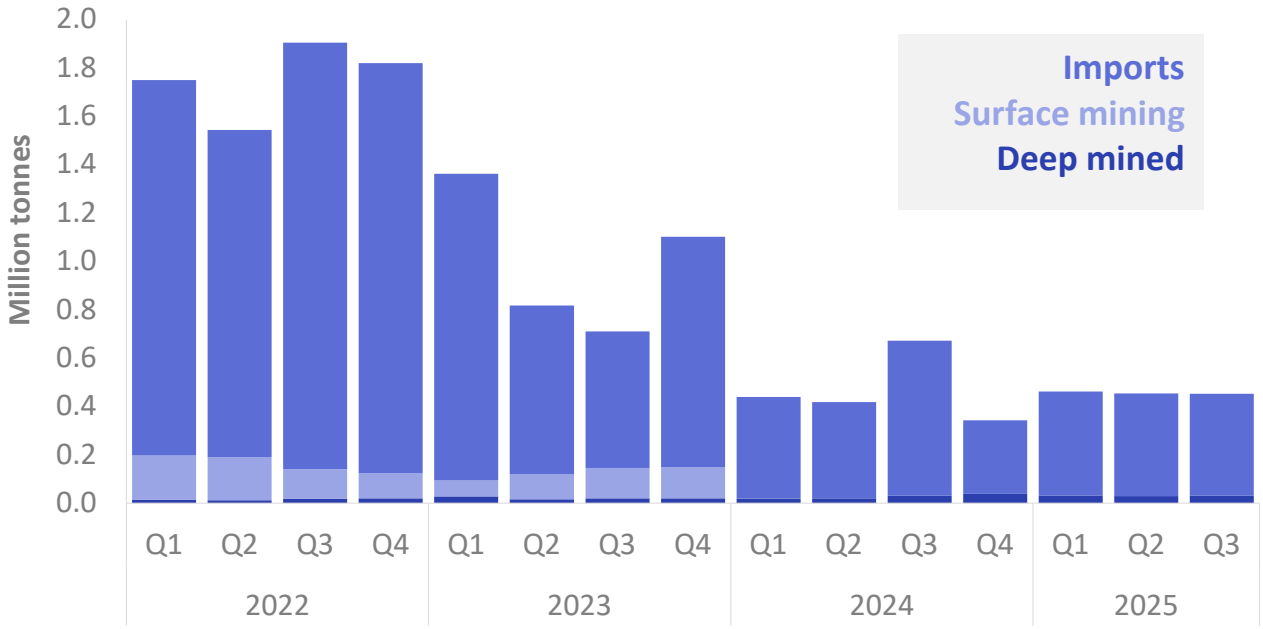
Chart 2.1 Coal Consumption (Energy Trends Table 2.1)



There was no coal-fired generation from power stations in the third quarter of 2025. The last coal-fired power plant - Ratcliffe-on-Soar - closed on 30 September 2024. Coal use has been phased out as electricity generation now favours gas, nuclear and renewables.

Domestic coal production has fallen steadily because of coal mine closures and reduced demand. **In Q3 2025, UK coal production fell to 30 thousand tonnes**, down 0.8 per cent compared to Q3 2024. However, total production was only 1.8 per cent of the value in Quarter 4 2015 when some large deep mines were still in operation. The last large surface mine Ffos-y-Fran closed at the end of November 2023. There is currently no surface mining in the UK.

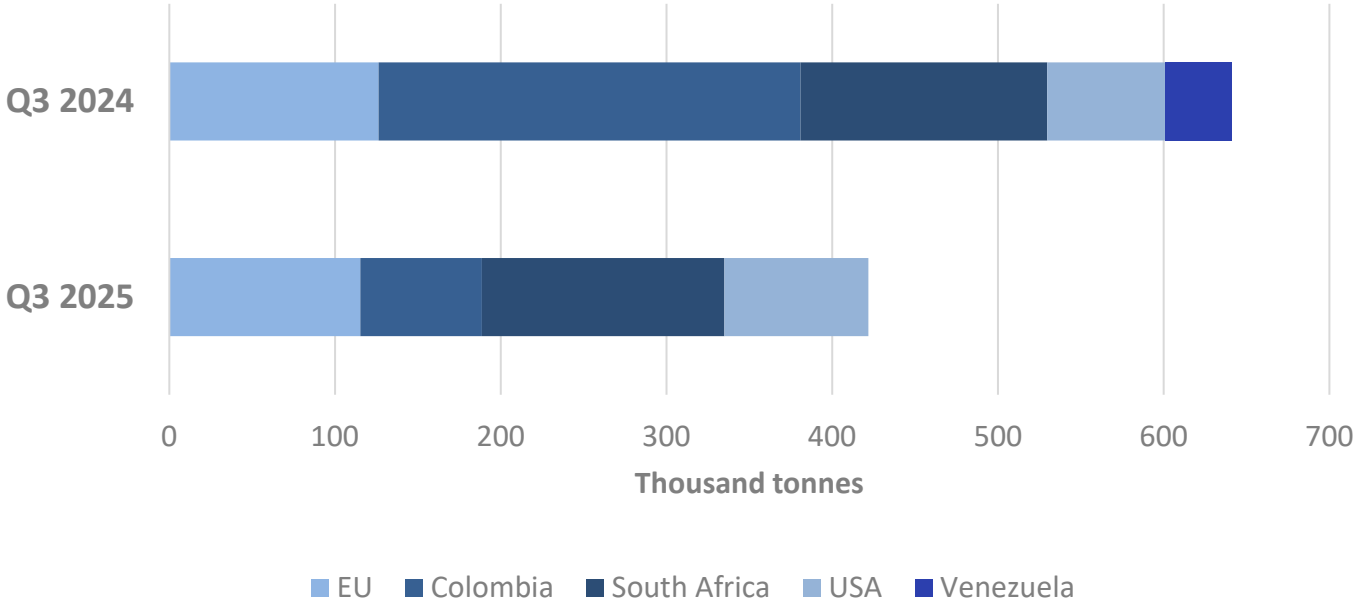
Chart 2.2 Coal Supply (Energy Trends Table 2.1)



In Quarter 3 2025, coal imports fell to 422 thousand tonnes, 34 per cent down on the same period last year. However, volumes are low due by historical standards due to low demand for coal (import peaked at 13.4 million tonnes in second quarter of 2013). Coal imports in Quarter 3 2025 comprised 291 thousand tonnes of steam coal (69 per cent of imports), 61 thousand tonnes of coking coal (14 per cent of imports) and 70 thousand tonnes of anthracite (17 per cent of imports).

The largest provider of coal to the UK during Quarter 3 was South Africa (35 per cent). This was followed by the European Union (27 per cent) and the USA (21 per cent). The UK banned Russian coal imports in August 2022. This reflects a decreasing reliance on Russian energy in line with that seen for both oil and gas.

Chart 2.3 Coal Imports (Energy Trends Table 2.4)



Section 3: Oil and oil products

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Key headlines

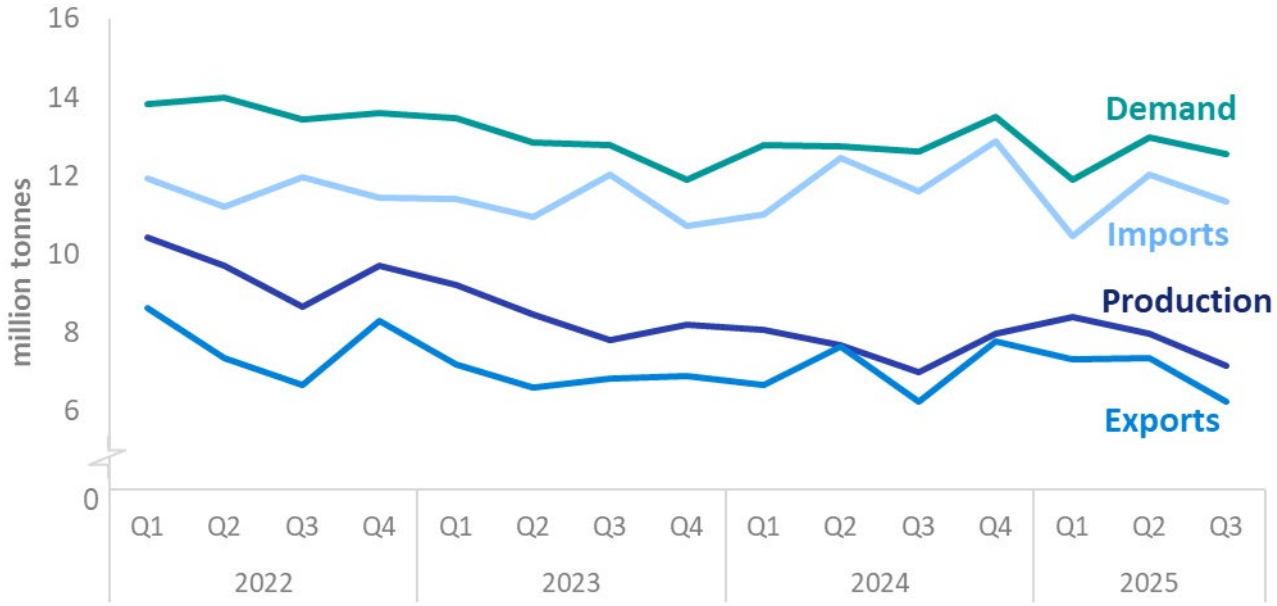
In Quarter 3 2025 indigenous production of primary oils rose by 2.5 per cent compared to the same period last year, when there was a programme of maintenance that reduced production. In the longer-term, there is a downward trend in production.

The UK was a net importer of all oils by 9.2 million tonnes, stable on last year (up just 0.6 per cent).

Production of petroleum products was down 1.9 per cent in Quarter 3 2025 compared to the same period the previous year, with demand down by 3.6 per cent.

The only demand sector that saw an increase was domestic, where the demand pattern appeared to follow lower prices for heating oil, rather than the temperatures observed in the quarter. Transport demand saw a 2.5 per cent decrease with falls in petrol, diesel and jet fuel.

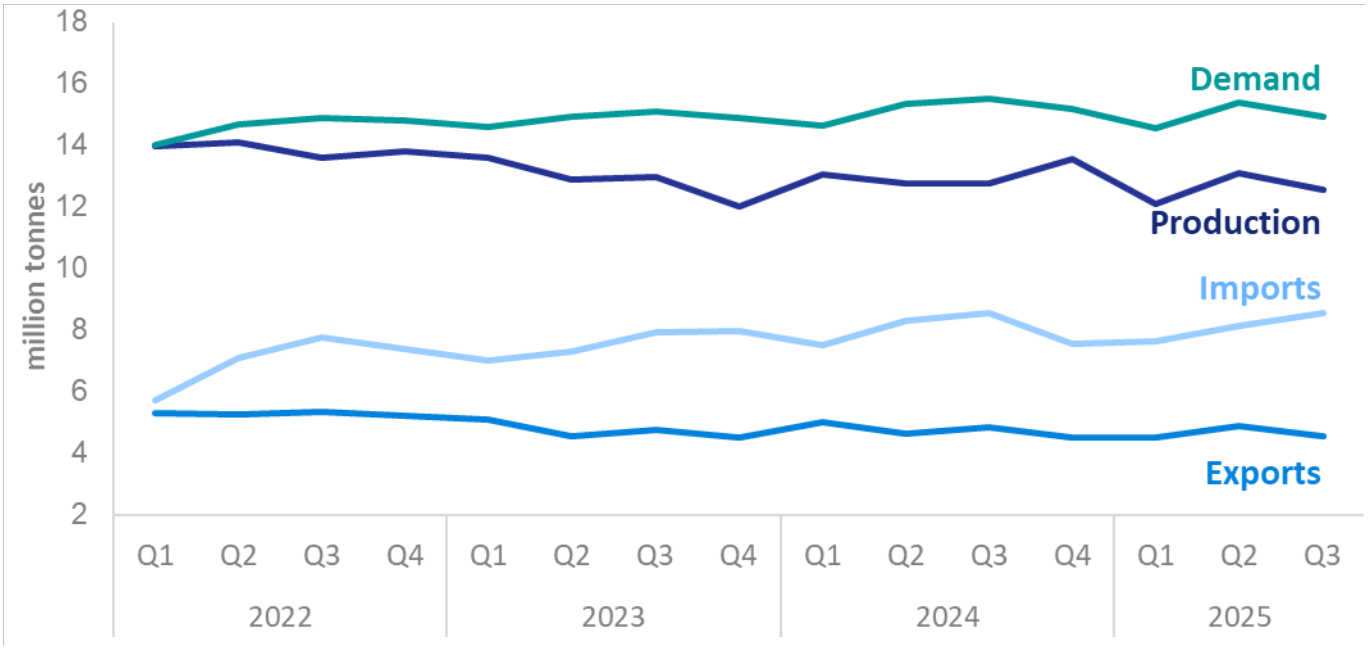
Chart 3.1 Production and trade of crude oil and NGLs (Energy Trends Table 3.1)



Despite the long-term downward trend in production from the North Sea basin, indigenous production of primary oils in Quarter 3 2025 was up by 2.5 per cent compared to the same period in the previous year. However, since a recent peak in 2019, indigenous production has been falling by an average of 8.0 per cent each quarter on the previous year.

Imports of primary oils dropped by 2.2 per cent in Q3 2025 compared to the previous year while exports of primary oils were stable. The UK continued to be a net importer of primary oils and in Q3 2025 net imports at 5.1 million tonnes were down 4.3 per cent on the same period in 2024. Refinery demand was broadly level compared to the previous year (down just 0.6 per cent).

Chart 3.2 Production and trade of petroleum products (Energy Trends Table 3.2)

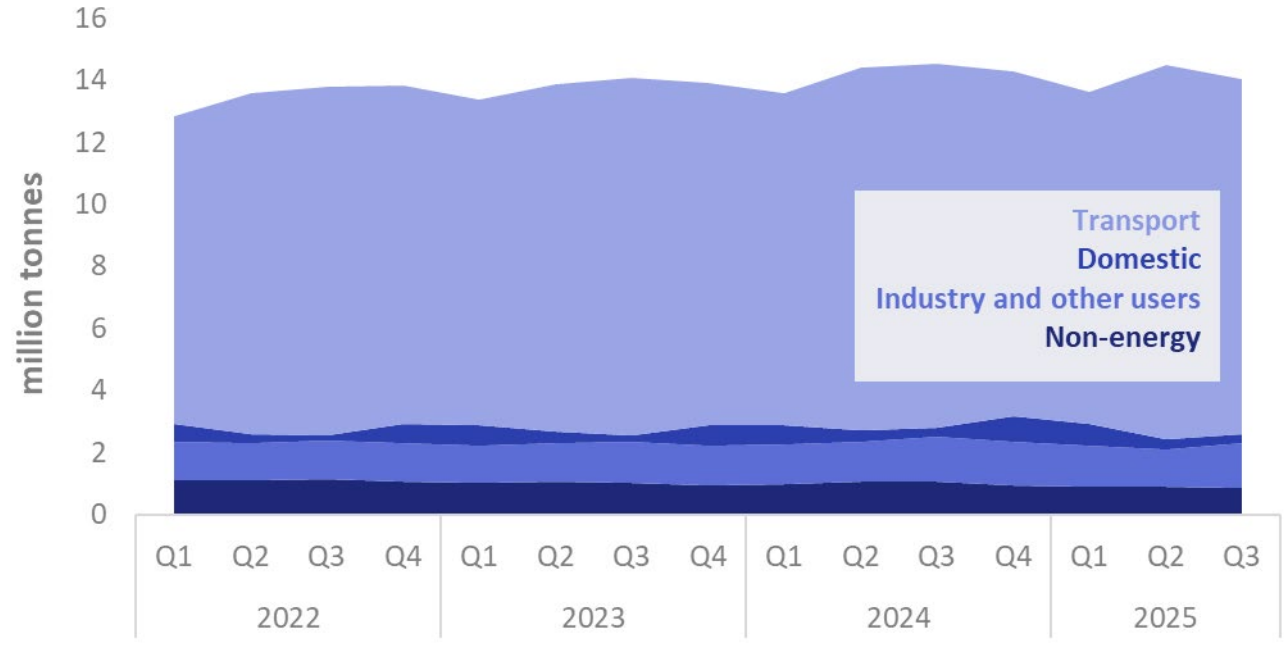


Production of petroleum products in Quarter 3 2025 was down 1.9 per cent compared to the same quarter in 2024. Most fuels saw decreases in production, aside from petrol and diesel. The fall in production is small despite two refineries closing in the UK this year – Grangemouth was transitioned to an import terminal in Quarter 2 and Lindsey closed in Quarter 3 – because there was maintenance during this period in 2024.

Demand was down by 3.6 per cent. Imports were stable while exports were 6.1 per cent down, but the UK remained a net importer of petroleum products by 4.0 million tonnes, an increase of 7.6 per cent on last year.

The top three single origin sources of product imports to the UK in Quarter 3 2025 were the Netherlands, the United States, and Kuwait. Together, these three countries accounted for more than 40 per cent of the UK's product imports. One quarter of imported jet fuel originated from Kuwait, meeting just over a fifth of jet demand. See Energy Trends Table 3.14 for imports by origin.

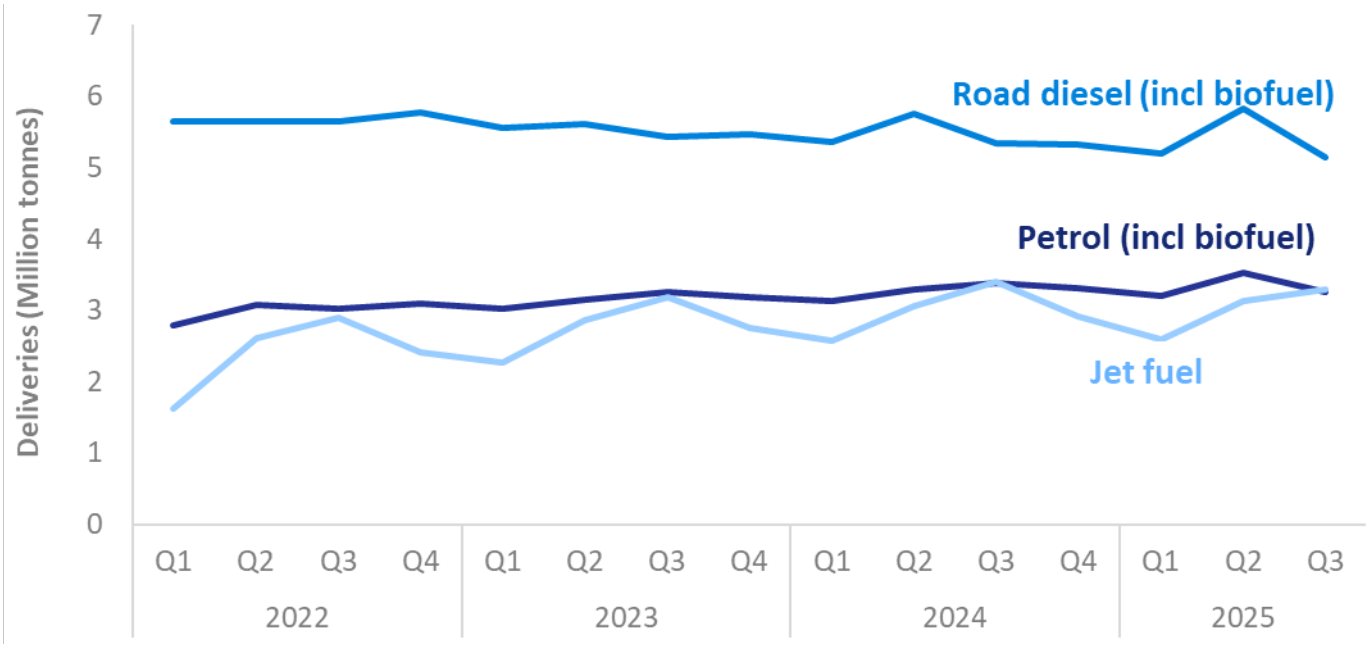
Chart 3.3 Demand sectors (Energy Trends Table 3.4)



Demand for petroleum products decreased by 1.9 per cent in Quarter 3 2025 compared to the same period in 2024. Transport demand decreased by 2.5 per cent, driven by decreases in deliveries of the three major fuels: 1.4 per cent for petrol, 2.5 per cent for diesel, and 3.3 per cent for jet fuel. This deviates from the year-on-year trend of recovery in the transport sector since the pandemic, especially with regards to jet fuel.

Jet fuel typically shows seasonal demand fluctuations (highs in summer) but has been increasing annually since the pandemic when demand more than halved between 2019 and 2020 - and decreased to less than 1.5 million tonnes during Quarter 3 2021. At 3.3 million tonnes in Quarter 3 this year jet demand has more than doubled but has nonetheless fallen by 3.3 per cent compared to last year.

Chart 3.4 Demand for transport fuels (Energy Trends Table 3.4)



Final consumption of petroleum products was down by 3.4 per cent on Quarter 3 2024, with the only notable increase in the domestic sector, up 2.6 per cent on the same period last year. Burning oil, or kerosene, is used for heating some homes that are off the gas-grid, and demand often follows temperatures. However, since the price spike following the invasion of Ukraine by Russia, customers have appeared to show more regard to price fluctuations. Although the UK had slightly higher temperatures in Quarter 3 compared to last year, prices continued to decrease, and demand was up as customers responded to these lower prices.

Section 4: Gas

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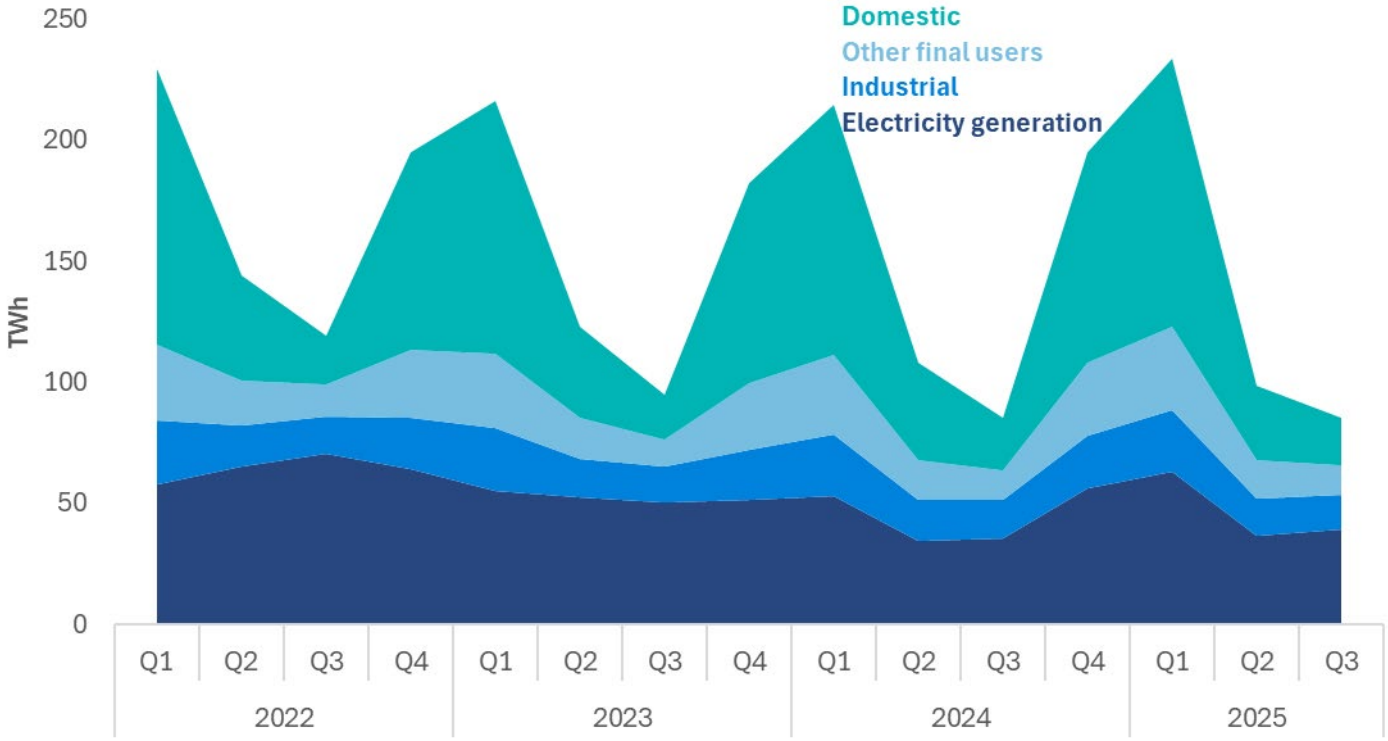
Key headlines

Demand for natural gas hit a record low in Quarter 3 2025, dropping to 102 TWh. This was a 1.7 per cent decrease compared to the same period in 2024, largely due to reduced demand for gas used for domestic (household) supply following warm temperatures this year. Conversely gas used for electricity generation increased by 9.5 per cent, as electricity imports decreased.

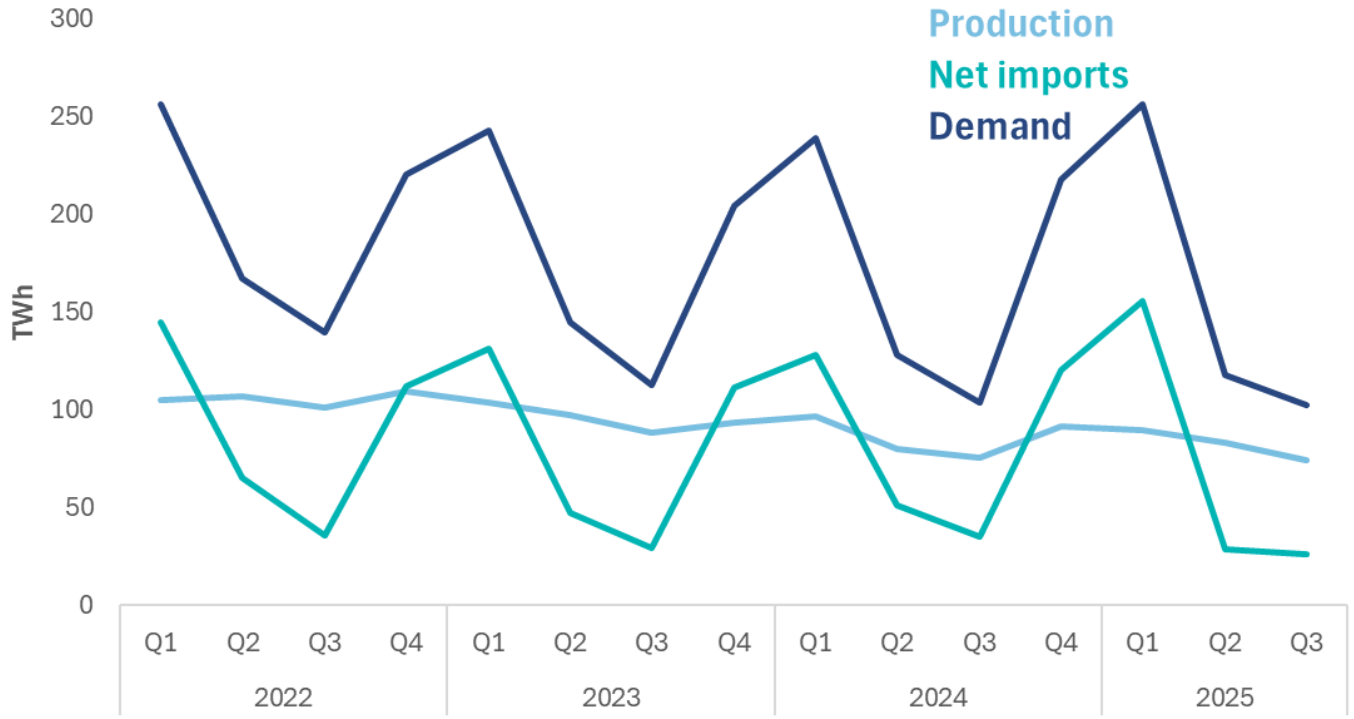
Imports decreased and exports remained stable in Quarter 3 2025. Imports decreased by 10 per cent, impacted by Norwegian outages and a reduction in imports of liquified natural gas (LNG). Indigenous production was relatively stable, down 1.2 per cent on the same period last year.

Chart 4.1 UK demand for natural gas (Energy Trends Table 4.1)



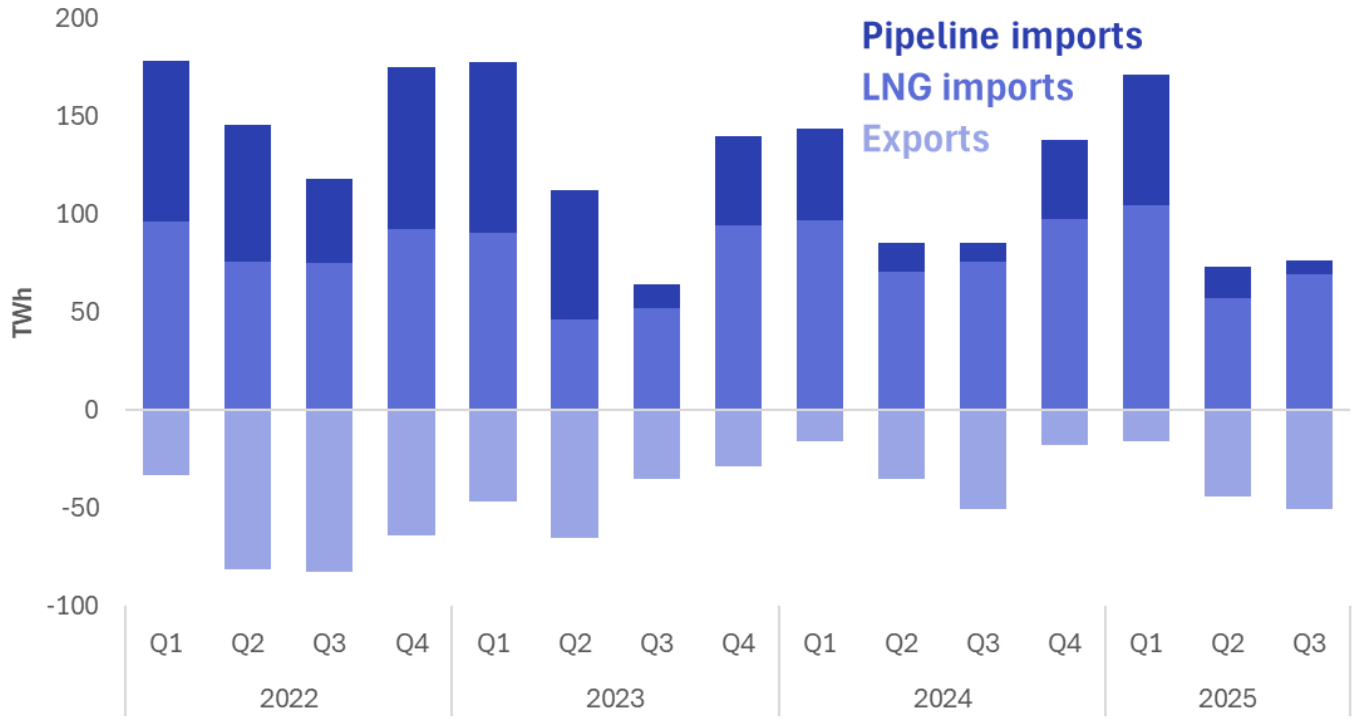
Demand for natural gas reached a record low of 102 TWh in Quarter 3 2025, down from 104 TWh in Quarter 3 2024. This was driven by reduced demand by final consumers which fell 7.7 per cent in the same period. Domestic (household) consumption saw the biggest decrease, falling by 10 per cent due to warm temperatures. Industrial demand also decreased by 8.5 per cent whilst demand by other final users (including commercial and public administration) was stable. Gas demand for electricity generation increased by 9.5 per cent in Quarter 3 2025 as gas helped make good a shortfall caused by outages and refuelling in the UK's nuclear fleet (see Table 5.3 for more information).

Chart 4.2 Production and trade of natural gas (Energy Trends Table 4.2)



In Quarter 3 2025, imports decreased and exports remained stable compared to Quarter 3 2024. So far this year trade has generally returned to the levels observed before the Russia-Ukraine conflict. Gas production was relatively stable in Quarter 3 2025, down by 1.2 per cent compared to the same quarter in 2024.

Chart 4.3 Imports by origin (Energy Trends Table 4.3)



Imports fell by 10 per cent in Quarter 3 2025, compared to the same period in the previous year, driven by a fall in pipeline imports which decreased by 8.3 per cent as imports from Norway were affected by Norwegian outages. Norway remained the largest import source accounting for 90 per cent of total imports in Quarter 3 2025. Imports of liquified natural gas (LNG) also decreased, down by 27 per cent compared to the same period last year, with US imports decreasing by 47 per cent, and imports from Peru dropping to zero.

Section 5: Electricity

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Key headlines

Quarter 3 of 2025 saw total UK electricity demand remain stable compared to the same period in 2024, at 73.0 TWh. Total electricity generation rose slightly by 0.4 per cent to 64.9 TWh, while net imports fell by 0.5 per cent to 8.1 TWh. Despite this, electricity generation remained relatively low and net imports remained relatively high for this time of the year.

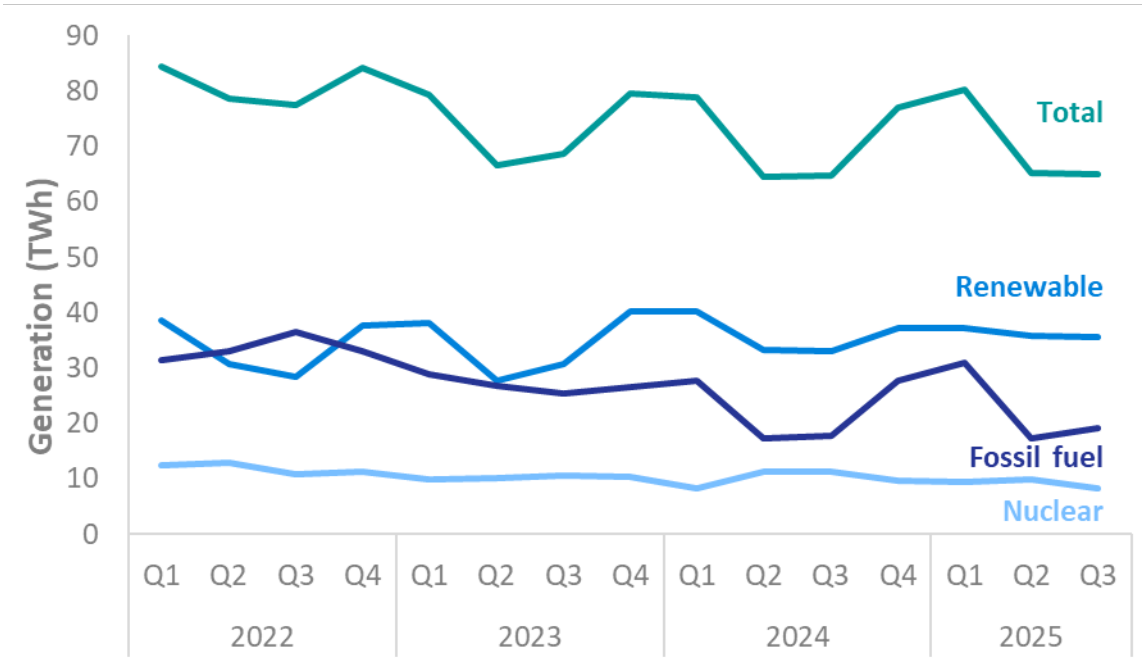
The share of renewable electricity generation reached 54.7 per cent, up 3.6 percentage points from Quarter 3 2024, and just below the record quarterly share recorded in Quarter 2 2025. Electricity generated from renewables rose by 7.4 per cent to reach 35.5 TWh. This was driven by increases in both solar and wind generation. Solar generation rose by 26 per cent to 6.6 TWh, while total wind generation rose by 7.3 per cent to 17.9 TWh.

The share of generation from low carbon sources fell by 1.4 percentage points to 67.2 per cent. This came as nuclear generation fell 28 per cent to a record quarterly low of 8.2 TWh, more than offsetting the increased generation from renewables.

Fossil fuel generation rose by 7.2 per cent to 19.1 TWh, accounting for 29.5 per cent of total generation, despite coal generation coming to a complete end. This came as generation by gas rose by 9.6 per cent to 18.8 TWh, compensating for the quarter's record low nuclear generation.

Final consumption rose by 1.0 per cent from Quarter 3 of 2024 to 63.4 TWh, despite warmer weather compared to the same period a year ago. Domestic (household) consumption rose by 1.0 per cent to 20.3 TWh, while consumption by other final users, including commercial use and transport, rose by 2.2 per cent to 23.2 TWh.

Chart 5.1 Electricity generated, by fuel type (Energy Trends Table 5.1)



Quarter 3 of 2025 saw total UK electricity demand remain stable compared to the same period in 2024, at 73.0 TWh. Total electricity generation rose by 0.4 per cent to 64.9 TWh, and net imports fell by 0.5 per cent to 8.1 TWh. Despite this, electricity generation remained relatively low, while net imports remained relatively high for this time of the year, accounting for 11.1 per cent of the UK's total electricity demand. Net imports fell as the 27 per cent increase in total exports to 3.7 TWh outweighed the 6.8 per cent increase in total imports to 11.8 TWh.

The share of renewable electricity generation reached 54.7 per cent, up 3.6 percentage points from Quarter 3 2024, and just below the record quarterly share in Quarter 2 2025. This was driven by increases in both solar and wind generation. Solar generation rose by 26 per cent to 6.6 TWh, reaching a share of 10.2 per cent of total generation. This occurred as average daily sun hours for the quarter were higher than the long-term average, alongside a substantial increase in solar capacity. Similarly, total wind generation rose by 7.3 per cent to 17.9 TWh. This came as offshore wind generation rose by 11 per cent to reach 10.9 TWh, and onshore wind generation rose by 2.3 per cent to 7.0 TWh. Average wind speeds were similar for both quarters, suggesting that the increase was supported by higher capacity. Finally, generation from bioenergy rose by 1.0 per cent to 10.1 TWh.

Despite higher renewable generation, the share of generation from low carbon sources fell by 1.4 percentage points to 67.2 per cent. This came as nuclear generation fell 28 per cent to a record quarterly low of 8.2 TWh, more than offsetting the increased generation from renewables.

Fossil fuel generation rose by 7.2 per cent to 19.1 TWh, accounting for 29.5 per cent of total generation, despite coal generation coming to a complete end. This came as generation by gas rose by 9.6 per cent to 18.8 TWh, compensating for the quarter's record low nuclear generation. Quarter 3 of 2025 marked a whole year without coal-fired power stations, following the closure of the last major coal plant in September 2024. Since then, coal generation had continued in a small number of industrial plants, but these were phased out during 2025, marking an end to coal generation in the UK.

Chart 5.2 Electricity consumption by sector (Energy Trends Table 5.2)

Final consumption rose by 1.0 per cent from Quarter 3 of 2024 to 63.4 TWh, despite warmer weather compared to the same period a year ago. This came as both domestic consumption and consumption by other final users, including commercial use, rose. Domestic consumption rose by 1.0 per cent to 20.3 TWh, while consumption by other final users, including commercial use and transport, rose by 2.2 per cent to 23.2 TWh. Meanwhile, industrial consumption fell by 0.3 per cent to 19.9 TWh.

Section 6: Renewables

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Key headlines

Renewable electricity generation was 35.5 TWh in Quarter 3 2025, 7.4 per cent higher than 2024 and a third quarter record. Over half of the increase was in solar PV, driven by a 14 per cent increase in capacity combined with higher sun hours. The remaining increase was largely in offshore wind which also saw new capacity added.

Over the last year, 4.1 GW of new renewable capacity has been added an increase of 6.8 per cent. 70 per cent of this was solar PV (2.9 GW) with offshore wind accounting for 1.0 GW.

Renewables' share of electricity generation was 54.7 per cent in Quarter 3 2025, up 3.6 percentage points on last year and just 0.3 percentage point lower than the record set in the previous quarter. This is the second highest percentage share on record. The increase on last year is largely due to new capacity.

Chart 6.1 Growth in renewable generation and capacity between Q3 2024 and Q3 2025 (Energy Trends Table 6.1)

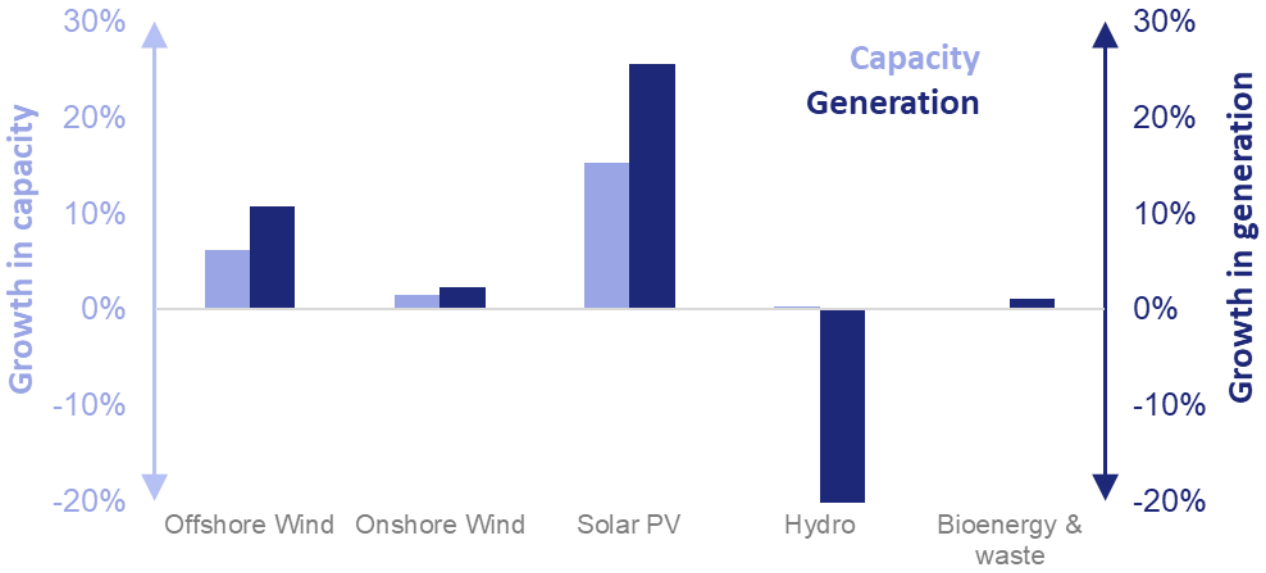

Chart 6.1 shows the growth in capacity over the last 12 months compared to the growth in generation between Q3 2024 and Q3 2025. Solar PV showed the largest increase in both capacity and generation (16 per cent and 26 percent respectively), with generation being further boosted by higher average sun hours (15 per cent up on last year).

Offshore wind saw a 6.1 per cent increase in capacity contributing to an 11 per cent increase in generation, though this growth is partly due to a subsea cable failure in 2024 supressing generation. Onshore wind saw smaller increases for both capacity and generation (up 2.3 per cent).

Hydro generation was down on last year by 20 per cent due to low reservoir levels, the cumulative effect of consecutive quarters with lower rainfall compared to last year. Bioenergy and waste has seen little new capacity over the last 12 months and a modest increase in generation.

Chart 6.2 Added capacity during the year for the leading technologies (Energy Trends Table 6.1)

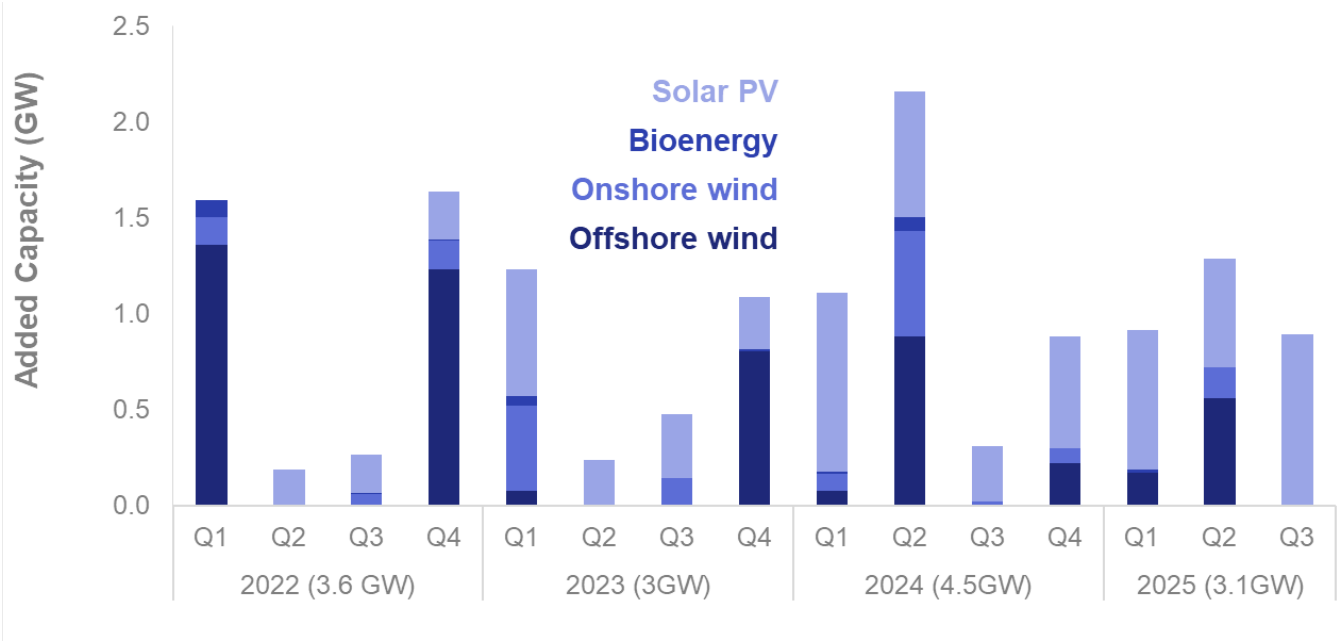

Chart 6.2 displays quarterly capacity added for the leading technologies. More than two thirds of new capacity so far in 2025 was solar PV, with the remainder in offshore wind during the first two quarters.

Solar PV capacity has increased by 2.9 GW over the last four quarters. This includes Cleve Hill installed in the latest quarter which, at 373 MW, is now the largest solar PV site in the UK.

Methodology Update

We are currently reviewing solar capacity and have been working with external partners to identify operational sites that have not been notified to us. As a result, we have identified an additional 1.5 GW of capacity from the total published in September. The capacity figures published in Table 6.1 and this chapter have been revised back to 2020 Q3 as a result of this review. Generation for Quarter 1 and 2 of 2025 have also been revised. However, generation for 2024 and previous years have not yet been revised due to consistency implications with the wider energy balance. It is anticipated that solar PV generation for 2024 will be revised up by around 1 per cent when we publish annual statistics in June 2026. The impact on previous years will be smaller.

Chart 6.3 Renewables' share of electricity generation Q4 2024 and 2025 (Energy Trends Table 6.1)

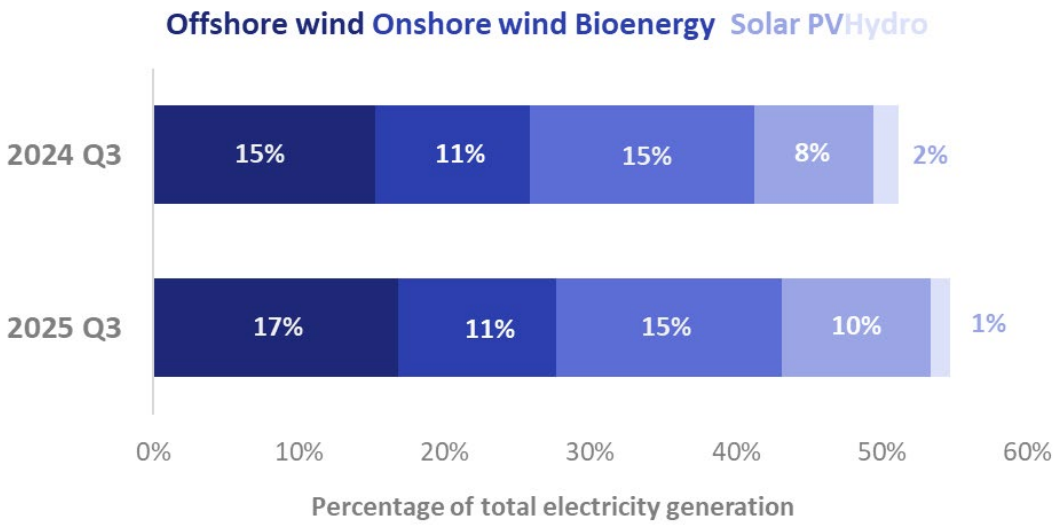

Chart 6.3 shows that, since Quarter 3 2024, solar PV's share of electricity generation has increased from 8 per cent to 10 per cent reflecting the increase in generation due to new capacity and higher average sun hours. Offshore wind's share has increased from 15 per cent to 17 per cent. Onshore wind and bioenergy remain unchanged with a dip for hydro.

Data tables and special articles

Data in this release

Data are collected by DESNZ through surveys of energy suppliers. This publication highlights key stories in energy in the UK for the specified period. Additional data are available in the quarterly and monthly statistical tables for each fuel and total energy. The tables are generally in commodity balance format, showing the flow from the sources of supply through to final use.

Special articles

Special articles that explore current topics of interest are available alongside this summary report. Included in this publication are:

Diversity of supply of natural gas in Europe, 2024

Electricity generation and supply in Scotland, Wales, Northern Ireland and England, 2020 to 2024

Feed-in Tariff load factor analysis: 2024/25

Statistical tables*

Data tables available as part of the Energy Trends series:

Total energy
Solid fuels and derived gases
Oil and oil products
Gas
Electricity
Renewables

The full range of special articles is available here: https://www.gov.uk/government/collections/energy-trends-articles

Additional sources of information

Index of Production, published by the Office for National Statistics:
https://www.ons.gov.uk/economy/economicoutputandproductivity/output/bulletins/indexofproduction/previousReleases

Index of Services, published by the Office for National Statistics:
https://www.ons.gov.uk/economy/economicoutputandproductivity/output/bulletins/indexofservices/previousReleases

Detailed annual Digest of UK Energy Statistics:
https://www.gov.uk/government/collections/digest-of-uk-energy-statistics-dukes

Tables showing foreign trade flows of energy:
https://www.gov.uk/government/statistics/dukes-foreign-trade-statistics

Weather tables produced by DESNZ using Met Office data:
https://www.gov.uk/government/collections/weather-statistics

Information on Energy Prices:
https://www.gov.uk/government/collections/quarterly-energy-prices

*Hyperlinks will open the most recently published table. If you require a previously published version of a table, please contact DESNZ at: energy.stats@energysecurity.gov.uk

Technical information

Methodology and revisions

More detailed notes on the methodology used to compile the figures and data sources are available on the collection pages for each fuel. The figures have not been adjusted for temperature or seasonal factors except where noted.

Percentage changes relate to the corresponding period a year ago. They are calculated from unrounded figures. They are shown as (+) or (-) when the percentage change is very large. Quarterly figures relate to calendar quarters. All figures relate to the United Kingdom unless otherwise indicated. Further information on Oil and Gas is available from the North Sea Transition Authority at https://www.nstauthority.co.uk/

Table of conversion factors

To	ktoe	TJ	GWh	million therms	To	toe	GJ	kWh	therms
From	Multiply by				**From**	Multiply by			
ktoe	1	41.868	11.63	0.39683	**toe**	1	41.868	11,630	396.83
TJ	0.023885	1	0.27778	0.0094778	**GJ**	0.023885	1	277.78	9.4778
GWh	0.085985	3.6	1	0.034121	**kWh**	0.000085985	0.0036	1	0.034121
million therms	2.52	105.51	29.307	1	**therms**	0.00252	0.105510	29.307	1

ktoe = thousand tonne of oil equivalent toe = tonne of oil equivalent

Sector breakdowns

Categories for final users are defined by Standard Industrial Classification 2007:

Fuel producers	05-07, 09, 19, 24.46, 35
Final consumers	
Iron and steel	24 (excluding 24.4, 24.53 and 24.54)
Other industry	08, 10-18, 20-23, 24.4 (excluding 24.46), 24.53, 24.54, 25-33, 36-39, 41-43
Transport	49-51 (part*)
Other final users	
Agriculture	01-03
Commercial	45-47, 49-51 (part*), 52-53, 55-56, 58-66, 68-75, 77-82
Public administration	84-88
Other services	90-99
Domestic	Not covered

* Note – transport sector includes only energy used for motion/traction purposes. Other energy used by transport companies is classified to the commercial sector.

Revisions policy

Figures for the latest periods are provisional and are liable to subsequent revision. The DESNZ statistical revisions policy sets out the revisions policy for these statistics, which has been developed in accordance with the UK Statistics Authority Code of Practice for Statistics.

Glossary

Tonne of Oil Equivalent

A common unit of measurement which enables different fuels to be compared and aggregated, and equal to 41.868 gigajoules. Usually expressed in Trends as ktoe (Thousand tonnes of oil equivalent) or Mtoe (Million tonnes of oil equivalent).

Indigenous production

The extraction or capture of primary fuels: for oil this includes production from the UK Continental Shelf, both onshore and offshore. Production by fuel is shown in Table 1.1. As with all data in Tables 1.1 to 1.3, these data are presented in either Million tonnes of oil equivalent or Thousand tonnes of oil equivalent. Various conventions are involved in the presentation of these data (e.g. for nuclear production the energy input is the heat content of the steam leaving the reactor) and these conventions are detailed in the Table notes and methodology documents (see link at end of glossary).

Primary supply

Primary supply is the sum of production, other sources, imports (+), exports (-), stock change, marine bunkers and transfers. A breakdown of supply by fuel is shown in Table 1.3.

Primary demand

Primary demand is the sum of the transformation, energy industry use, losses and final energy consumption by the industry sectors including non-energy use. A breakdown of demand by fuel is shown in Table 1.3.

Primary inland energy consumption

The sum of primary supply less non-energy use (Table 1.2).

Final energy consumption

Energy consumption by final user, i.e., which is not being used for transformation into other forms of energy. Final energy consumption is shown by sector and for individual fuels in Table 1.3.

Non-energy use

Includes fuel used for chemical feedstock, solvents, lubricants, and road making material, see Table 3.2.

Imports

Goods entering the UK, e.g. via pipeline from Norway or LNG cargoes from Qatar and the US for gas (Table 4.3) and interconnectors for electricity from The Netherlands (Table 5.6).

Exports

Goods leaving the UK, e.g. via LNG regassification cargoes to Europe for gas (Table 4.4) and interconnectors for electricity to France (Table 5.6).

Transformation

Transformation covers those activities that transform fuels into a form which is better suited for specific uses. Most of the transformation activities correspond to particular energy industries whose main business is to manufacture the product associated with them. Certain activities involve transformation to make products that are only partly used for energy needs (e.g. coke and oven coke) or are by-products of other manufacturing processes (e.g. coke oven and blast furnace gases). A breakdown of transformation by fuel is shown in Table 1.3.

Seasonally and temperature adjustment

The temperature corrected series of total inland fuel consumption, Table 1.2 indicates what annual consumption might have been if the average temperature during the year had been the same as the average for the years 1991 to 2020. Table 1.3 shows seasonal and temperature adjusted final consumption.

Primary oil

Crude oil, natural gas liquids and feedstocks. (Table 3.1)

Petroleum products

Motor spirit, diesel, gas oil, aviation turbine fuel, fuel oils, petroleum gases, burning oil and other products. (Table 3.4)

Transport fuels

Motor spirit and diesel for road and aviation turbine fuel for aviation. (Table 3.4)

Electricity generation

Electricity generation represents the quantities of fuels burned for the generation of electricity. The activity is divided into two parts, covering the Major Power Producers such as those generating electricity for sale, as their main business activity, and autogenerators such as those generating electricity for their own needs but who may also sell surplus quantities (Table 5.1).

Fossil fuels

Coal, oil and natural gas. The percentage share of electricity generation by fossil fuels is shown in Table 5.1.

Renewables

Renewable energy includes solar power, wind, wave, tidal, hydroelectricity, and bioenergy. Solid biomass includes wood and wood pellets, straw, short rotation coppice, and the biodegradable component of wastes (the non-biodegradable component is shown as a memo item in Table 6.1). Liquid biofuels include bio diesel and bioethanol, along with new and emerging fuels such as bio LPG (liquified petroleum gas). Biogases include landfill gas, sewage gas, and anaerobic digestion. The percentage share of electricity generation by renewables is shown in Table 5.1.

Low carbon

Nuclear and renewables. The percentage share of electricity generation by low carbon sources is shown in Table 5.1.

Additional information

A more detailed glossary is available in The Digest of United Kingdom Energy Statistics (DUKES), Annex B, whilst the energy balance methodology note provides background detail on the compilation of an energy balance, as well as an explanation of each of the key energy balance flows. Notes in individual Energy Trends tables and individual fuel methodology notes (see links below) provide further detail.

Coal methodology note

Oil methodology note

Gas methodology note

Electricity methodology note

Renewables methodology note

Related publications

Recent publications of interest

Energy Consumption in the United Kingdom (ECUK)
Detailed data on end use estimates of energy in the UK: www.gov.uk/government/collections/energy-consumption-in-the-uk

Sub-national total final energy consumption
Findings of the sub–national energy consumption analysis in the UK for all fuels, for the period covering 1 January to 31 December, with gas consumption covering the annual period from mid-May: www.gov.uk/government/collections/total-final-energy-consumption-at-sub-national-level

Sub-national electricity consumption
Electricity consumption by consuming sector for Great Britain and devolved administration areas. Data are based on the aggregation of Meter Point Administration Number readings as part of DESNZ's annual meter point electricity data exercise: www.gov.uk/government/collections/sub-national-electricity-consumption-data.

Sub-national gas consumption
Gas consumption by consuming sector for Great Britain, and devolved administration areas. Data are based on the aggregation of Meter Point Reference Number readings throughout Great Britain as part of DESNZ's annual meter point gas data exercise. Data are subject to a weather correction factor to enable comparison of gas use over time: www.gov.uk/government/collections/sub-national-gas-consumption-data.

Sub-national road transport consumption
Road transport fuels consumption in the UK at regional and local authority level. Data is modelled and provided to DESNZ by Ricardo Energy & Environment, with estimates based on where the fuel is consumed, rather than where it is purchased.
www.gov.uk/government/collections/road-transport-consumption-at-regional-and-local-level

Sub-national consumption of residual fuels
Non-gas, non-electricity and non-road transport fuels consumption in the UK. Includes coal, petroleum, solid fuels, and bioenergy not for generation or road use: www.gov.uk/government/collections/sub-national-consumption-of-other-fuels

Further information

Accredited official statistics

These statistics are accredited official statistics. Accredited official statistics are called National Statistics in the Statistics and Registration Service Act 2007.

These accredited official statistics were independently reviewed by the Office for Statistics Regulation (OSR) in June 2014. They comply with the standards of trustworthiness, quality and value in the Code of Practice for Statistics.

Our statistical practice is regulated by the Office for Statistics Regulation.

OSR sets the standards of trustworthiness, quality and value in the Code of Practice for Statistics that all producers of official statistics should adhere to.

You are welcome to contact us by emailing energy.stats@energysecurity.gov.uk with any comments about how we meet these standards.

Alternatively, you can contact OSR by emailing regulation@statistics.gov.uk or via the OSR website.

Pre-release

Some ministers and officials receive access to these statistics up to 24 hours before release. Details of the arrangements for doing this and a list of the ministers and officials that receive pre-release access to these statistics can be found in the DESNZ statement of compliance with the Pre-Release Access to Official Statistics Order 2008.

User engagement

Users are encouraged to provide comments and feedback on how these statistics are used and how well they meet user needs. Comments on any issues relating to this statistical release are welcomed.

This publication is available from: https://www.gov.uk/government/collections/energy-trends

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Please tell us what format you need. It will help us if you say what assistive technology you use.

Diversity of supply of natural gas in Europe, 2024

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Key headlines

European gas demand stabilised following successive declines, with overall European natural gas demand remaining flat in 2024 compared to 2023. Demand in the UK dropped 2.3 per cent, mainly due to reduced use in electricity generation.

Norway accounted for 59 per cent of total European natural gas production and remains Europe, and the UKs, principal source of imports. Liquified natural gas (LNG) imports to Europe decreased by 17 per cent in 2024 compared to 2023, and the US remained the largest LNG supplier to both Europe and the UK. European pipeline imports from Russia increased by 6.7 per cent in 2024 but remained well below pre-conflict levels, accounting for 8.7 per cent of gross supply. The UK last imported Russia gas in March 2022.

UK trading patterns in 2024 returned to levels seen before the Russia-Ukraine conflict, with UK exports of natural gas to Europe down by 23 per cent in 2024 on 2023. UK production fell by 10 per cent to its lowest level since 1973, continuing a long-term decline in the mature North Sea basin.

Background

Europe, including the UK, use natural gas for electricity generation, domestic (household) heating and cooking, and other purposes such as industrial processes. This article sets out how countries in Europe meet their natural gas demand via production and imports.

This article uses Energy Trends and International Energy Agency (IEA) data. European IEA member states reflect the majority of Europe but excludes Andorra, Kosovo, Liechtenstein, Monaco, San Marino, and Vatican City which are not included in the article. Cyprus, Iceland, and Montenegro did not produce or consume natural gas so are also not included in the article.

Methods

Three indicators have been used to undertake this analysis.

Self-sufficiency

Production is the process of extracting natural gas from the earth. Self-sufficiency is a measure of a country's ability to meet its demand through production. This is calculated as production divided by demand where:

- Self-sufficiency equals 0, there was no natural gas production
- Self-sufficiency is between 0 and 1, production met some demand
- Self-sufficiency equals 1, production equalled demand
- Self-sufficiency greater than 1, production exceeded demand

Generally higher self-sufficiency means more secure natural gas supply.

Diversity index

The diversity index is a measure of the number of import sources, weighted by the country of origin's political stability[1].

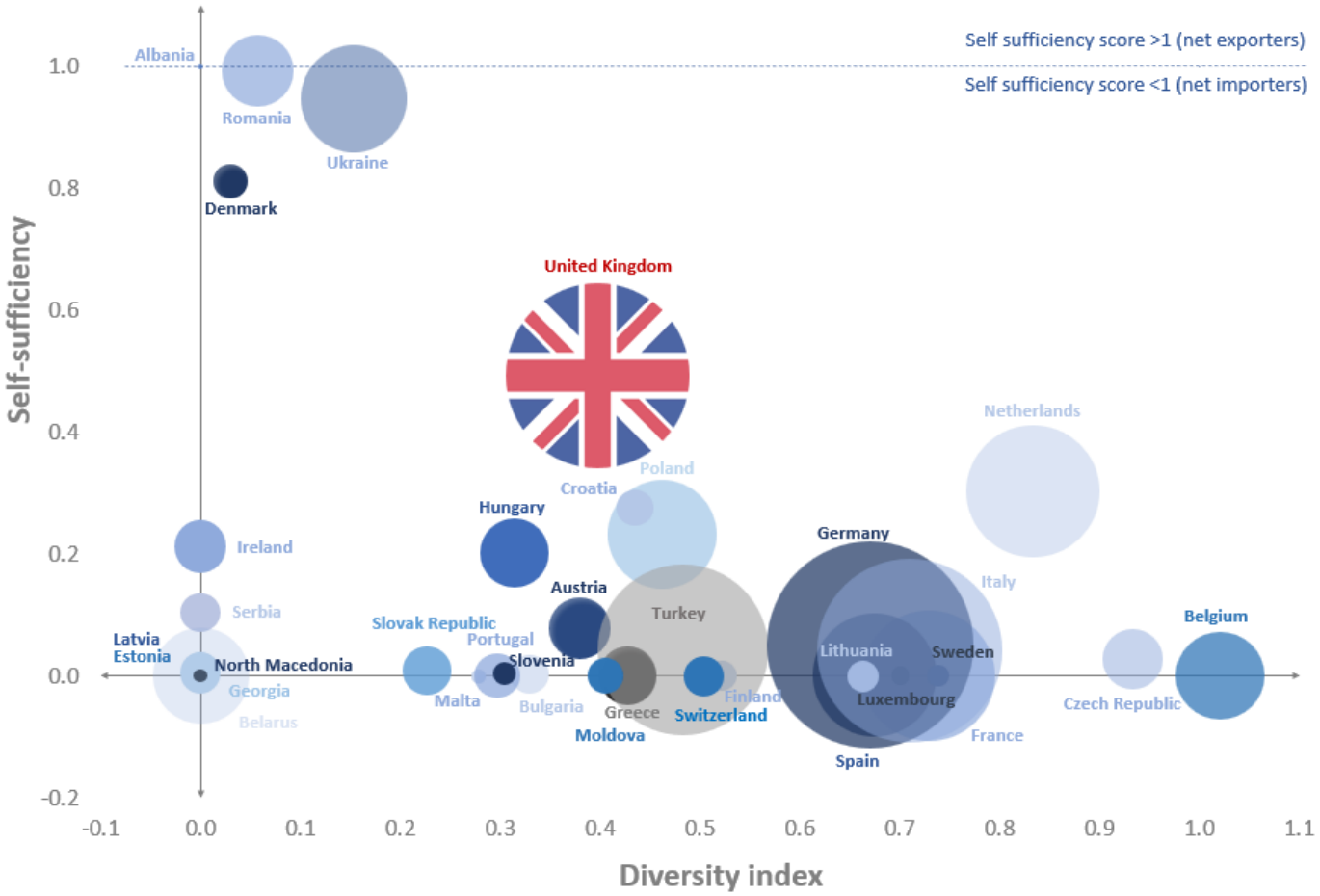
This means that a country with many import sources of high political stability will have a high diversity index. Conversely, a country with few import sources of low political stability will have a low diversity index. In general, a diverse source of imports means gas supply is more secure. This is further improved if the source countries are politically stable.

Supply index

The supply index is the sum of self-sufficiency and diversity index. A higher supply index can be indicative of higher security in terms of a country's sources of gas. A supply index of 0 indicates that a country has no production and only one import source.

[1] Data sourced from World Bank governance indicators. See Appendix 1 for underlying data and Appendix 2 for method.

Chart 1: Self-sufficiency and diversity index for European countries, 2024



Norway is excluded from the graph because it's self-sufficiency is substantially larger than other countries (27). See Appendix 1 for underlying data.

Chart 1 shows the relationship between self-sufficiency and diversity index. The size of each bubble represents natural gas demand in each country.

Self-sufficiency

Norway is the largest producer of natural gas in Europe, and in the top 10 globally. In 2024, Norway produced more than 27 times the amount of natural gas it consumed, accounting for 59 per cent of total European natural gas production. Europe has an average self-sufficiency score of 0.84, this is driven by Norway with almost all other countries below the average (the average self-sufficiency score falls to 0.15 when Norway is excluded).

Albania continued to be self-sufficient in 2024, producing the same amount of gas that it consumed. Of the European countries who use natural gas, Albania's demand is the smallest.

The UK had a self-sufficiency score of 0.49 meaning that just under half of gas demand could have been met by production in 2024.This was down from 0.54 in 2023 as production in the UK fell 10 per cent to the lowest level since 1973, continuing a long-term downward trend, in line with declining output from the North Sea basin.

Of the 39 countries included in this analysis, 13 had a self-sufficiency score of 0 meaning they did not produce any gas and were reliant on imports to meet supply.

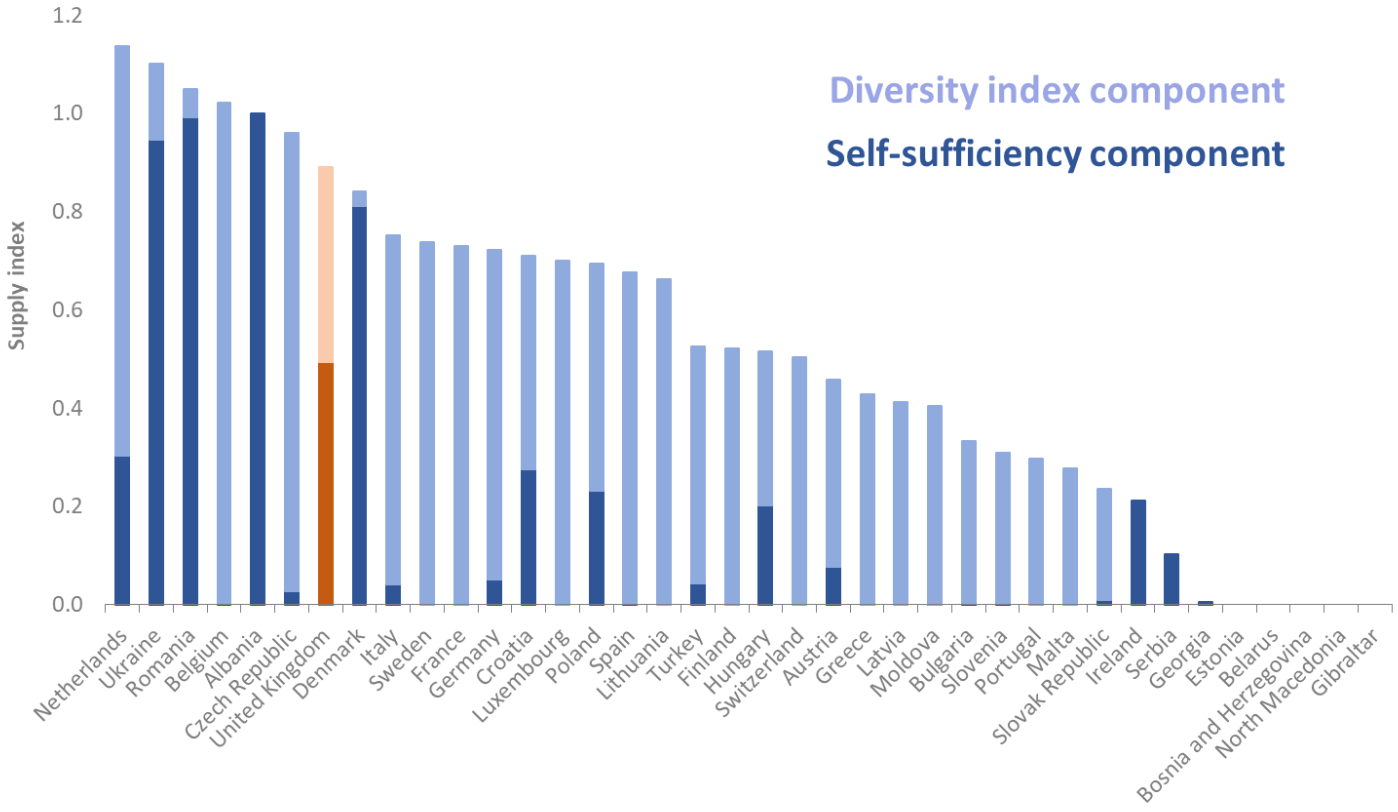
Diversity

Most countries use imports to meet demand. In 2024, the average diversity index of European countries was 0.38. The proximity of Western European countries to the sea facilitates shipments of liquified natural gas (LNG) from a wider range of countries than would be possible with pipelines alone, which contributes to their tendency to have higher diversity indexes. In 2024, the UK's diversity score was 0.40, down from 0.46 in 2023, whilst the UK's number of import sources remained the same, the proportion of imports from large sources increased.

Demand

Germany remained the largest natural gas consumer in Europe (78 bcm), followed by the UK, Italy and Turkey; these four countries accounted for over half of total European natural gas demand in 2024. Overall European demand for natural gas was flat in 2024 compared to 2023 in contrast to the previous year's declines. UK gas demand decreased by 2.2 per cent, due to a decline in gas demand for electricity generation.

Chart 2: Supply index for European countries, 2024



Norway is excluded from the graph because it is self-sufficiency is substantially larger than other countries (27), see Appendix 1 for underlying data.

Chart 2 shows the supply index for European countries in 2024. The self-sufficiency score and diversity index have been stacked, indicating the relative contribution of these components to the security of supply ranking.

Ukraine

In 2024, Ukraine's self-sufficiency continued to rise, reaching 0.95, due to a large increase in indigenous production compared to a moderate increase in demand. Ukraine's diversity index decreased as imports were sourced from fewer countries. Ukraine had the third highest supply index behind Norway and the Netherlands. This analysis does not consider other factors which could be considered when evaluating supply.

Supply index

In 2024, Norway had the highest supply index of European countries at 27.71. The average European supply index was 1.22, bolstered by Norwegian production, and falling to 0.52 when excluding Norway, reflecting most countries' reliance on imports to meet demand. Thirteen countries produced no natural gas, so their supply index equalled their diversity index. Of these countries, Bosnia and Herzegovina, Gibraltar, North Macedonia, Belarus, and Estonia had only one import source, resulting in a supply index of zero.

With a supply index of 0.89, the UK had the eight highest European supply index behind Norway, the Netherlands, Ukraine, Romania, Belgium, Albania, and the Czech Republic. This was down from 1.00 in 2023. The UK is Europe's second largest producer of natural gas; however, it is substantially smaller than Norway, producing 76 per cent less gas than Norway in 2024.

Sources of European gross gas supply

Most European natural gas imports arrive via pipeline for which infrastructure is well-established. In 2024, imports by pipeline made up 70 and 75 per cent of total imports to Europe and the UK respectively. Pipeline infrastructure means it is often convenient to import gas from neighbouring countries. Countries can also import natural gas as shipments of LNG which is gas that has been cooled to a liquefied state, making it easier to store and transport. It can then be regasified at import terminals, before being transferred to the pipeline system. The UK has the second largest LNG regasification infrastructure in Europe, behind Spain, with three import terminals - Dragon, the Isle of Grain, and South Hook.

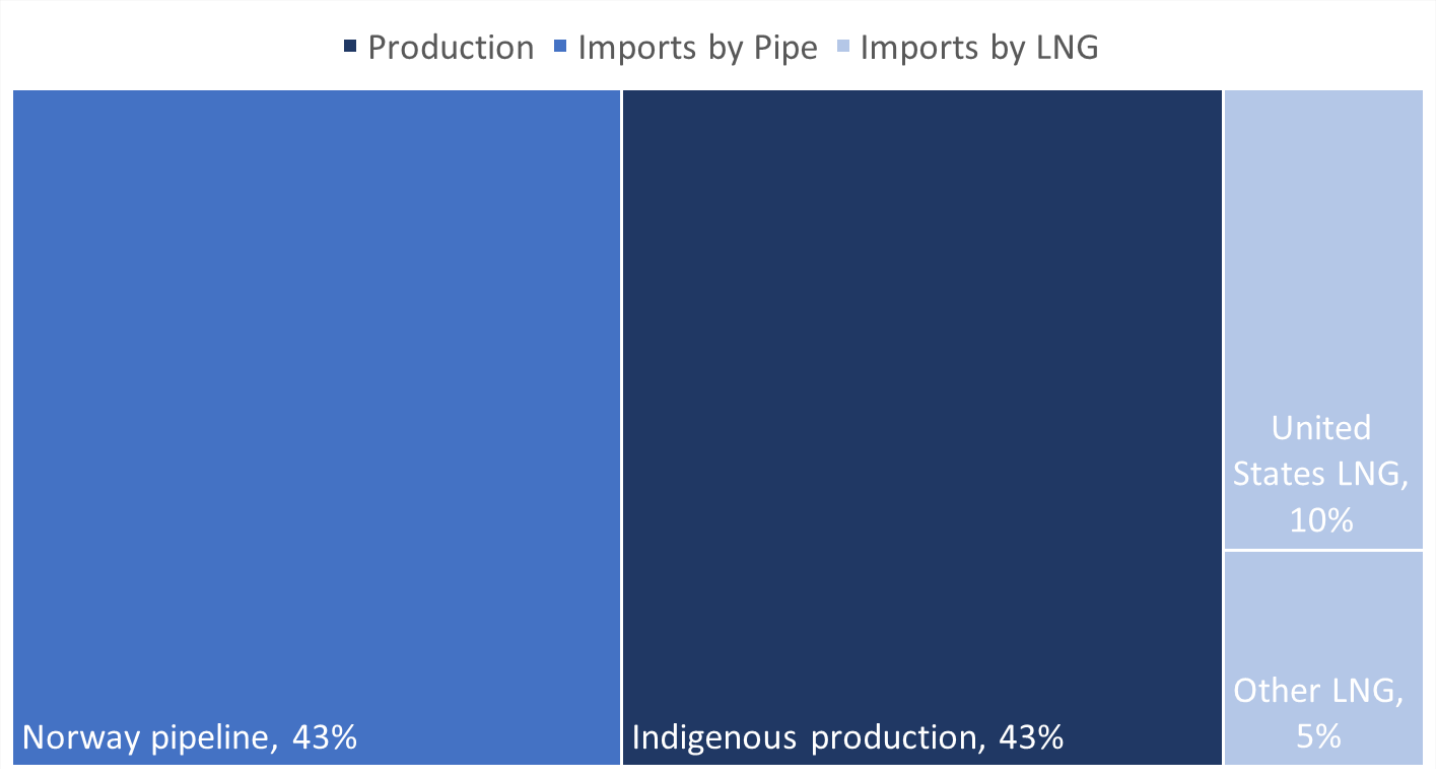
The top import sources for European countries have remained relatively unchanged since 2021, with 13 countries ranking within the top 15 sources each year from 2021 to 2024. Of these, Norway, Russia, Algeria, and the United States have consistently ranked within the top five sources of European imports although the proportion of European supply met by Russian gas has fallen sharply since 2021 when Russian imports comprised 24 per cent of gross supply.

European pipeline imports from Russia[2] fell by almost 50 per cent in 2023 compared to 2022 as many European countries moved away from Russian gas following the invasion of Ukraine. Imports from Russia increased by 7 per cent in 2024 compared to 2023 and Russia remained the second largest pipeline import source to Europe behind Norway, down from the largest in 2022, accounting for 9 per cent of gross supply.

LNG imports decreased by 17 per cent in 2024 compared to 2023, imports of LNG from the US made up 9 per cent of gross supply. Imports of gas to Europe from the UK decreased by 14 per cent in 2023 compared to record highs in 2022 slightly higher than pre-conflict averages.

[2] Russia acts as a transit country for gas from Kazakhstan and Turkmenistan, so it should be noted that the origin of this gas is not necessarily all Russian.

Chart 3: Sources of UK gross gas supply, 2024



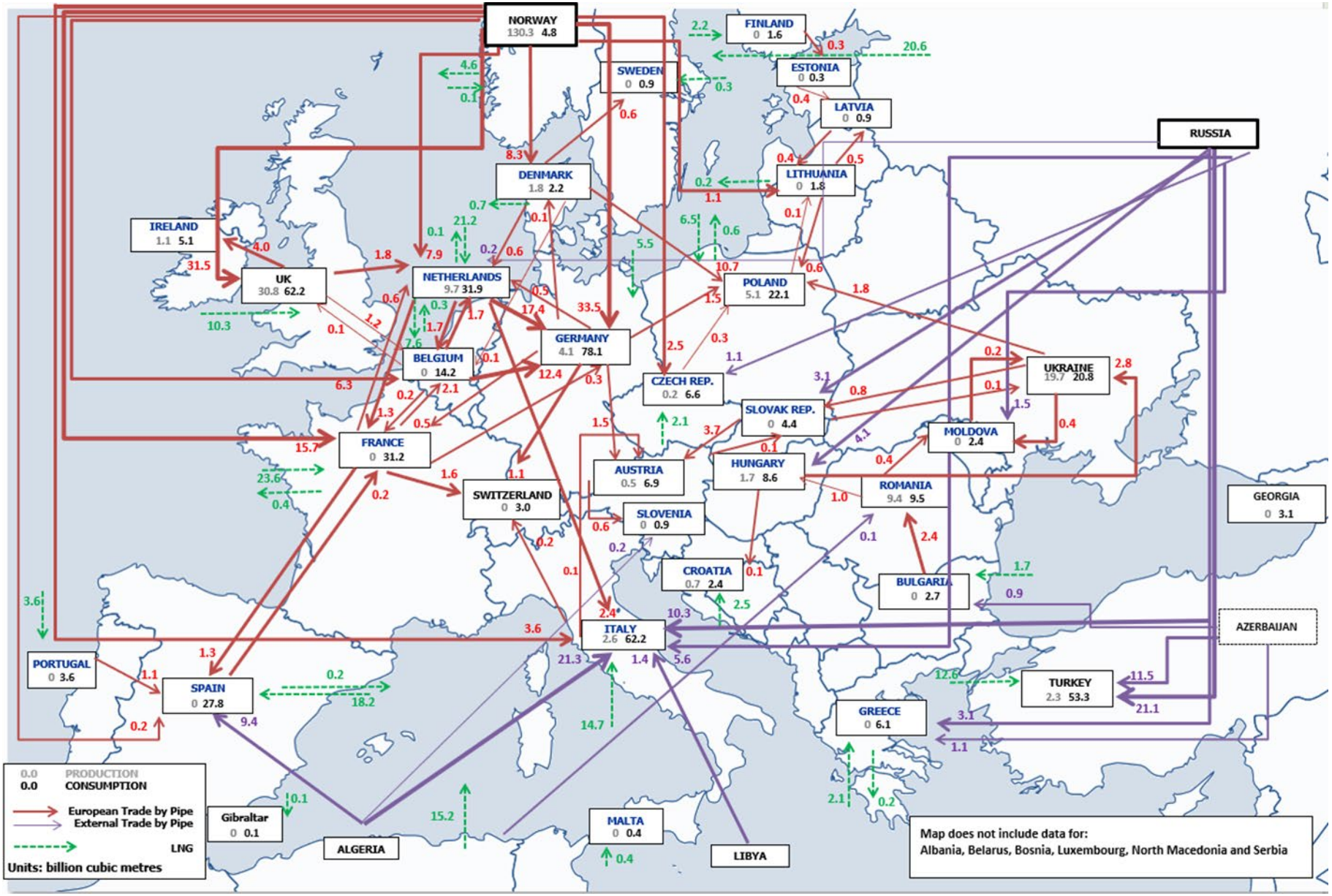
Rounded data do not equal 100 per cent, Countries included in 'Other LNG' include Qatar, Trinidad and Tobago, Algeria, Angola, Peru, Norway, Nigeria, Equatorial Guinea and Egypt

Chart 3 shows gas supply sources for the UK in 2024. In 2024, UK trading patterns returned to close to pre-conflict levels. Norway remained the UK's largest import source, accounting for 43 per cent of gross supply. Norway accounted for almost 100 per cent of all pipeline imports as Belgian and Dutch interconnectors were mainly used for exports.

Imports of LNG from the US accounted for 68 per cent of total UK LNG imports in 2024, up from 61 per cent in 2023. The US remained the largest source of LNG to the UK, having overtaken Qatar in 2022. Qatari LNG imports accounted for 8 per cent of total LNG imports and despite being the second largest source, this was the lowest proportion seen in over a decade. In total, the UK sourced LNG from 10 different countries in 2024, stable on 2023. Following sanction announcements and industry self-sanctioning, the last cargo of Russian LNG imported to the UK was received in March 2022.

Map 1:

Map 1 illustrates the diversity of import supply, as well as the complexities of inter-EU gas trade.



Appendix 1: Underlying data for charts

Table 1: Underlying data for Chart 1 and Chart 2, source: IEA (http://data.iea.org/)

Country	Self-sufficiency	Diversity index	Supply index	Demand (mcm)
Albania	1.00	0.00	1.00	53
Austria	0.08	0.38	0.46	6,936
Belarus	0.00	0.00	0.00	16,857
Belgium	0.00	1.02	1.02	14,182
Bosnia and Herzegovina	0.00	0.00	0.00	224
Bulgaria	0.00	0.33	0.33	2,742
Croatia	0.28	0.44	0.71	2,366
Czech Republic	0.03	0.93	0.96	6,647
Denmark	0.81	0.03	0.84	2,221
Estonia	0.00	0.00	0.00	345
Finland	0.00	0.52	0.52	1,629
France	0.00	0.73	0.73	31,213
Georgia	0.00	0.00	0.00	3,061
Germany	0.05	0.67	0.72	78,093
Gibraltar	0.00	0.00	0.00	97
Greece	0.00	0.43	0.43	6,093
Hungary	0.20	0.31	0.52	8,579
Ireland	0.21	0.00	0.21	5,086
Italy	0.04	0.71	0.75	62,225
Latvia	0.00	0.41	0.41	853
Lithuania	0.00	0.66	0.66	1,821
Luxembourg	0.00	0.70	0.70	587
Malta	0.00	0.28	0.28	373
Netherlands	0.30	0.83	1.14	31,894
Norway	27.00	0.71	27.71	4,825
Poland	0.23	0.46	0.69	22,123
Portugal	0.00	0.30	0.30	3,634
Republic of Moldova	0.00	0.41	0.41	2,375
Republic of North Macedonia	0.00	0.00	0.00	336
Republic of Türkiye	0.04	0.48	0.53	53,262
Romania	0.99	0.06	1.05	9,471
Serbia	0.10	0.00	0.10	2,862
Slovak Republic	0.01	0.23	0.24	4,397
Slovenia	0.00	0.30	0.31	877
Spain	0.00	0.68	0.68	27,808
Sweden	0.00	0.74	0.74	892
Switzerland	0.00	0.50	0.50	2,975
Ukraine	0.95	0.15	1.10	20,820
United Kingdom	0.49	0.40	0.89	62,422
Average	**0.84**	**0.38**	**1.22**	**12,904**

Appendix 2: Methodology

Self-sufficiency

Data for natural gas was extracted from the IEA database. Self-sufficiency was determined from data on production and demand (production (mcm) ÷ demand (mcm)).

Diversity index

The diversity index used here is a product of a standard diversity index and an index for political stability. As a basic index for measuring diversity, we used the Shannon-Wiener diversity index:

$$\sum_{i=1}^{n} -x_i ln(x_i)$$

Where x is the proportion of total natural gas supply represented by the i^{th} source country and n represents the final source country. A value below 1 signifies a country that is dependent on a small range of import sources, a value above 1 represents a country with a wider range of import sources. The minimum value of zero denotes a country that has one imported fuel source or relies entirely on production (or a country with no imports). The Shannon-Wiener was chosen here because it places weight on the diversity of contributions from smaller countries and reduces the impact of larger nations.

Political stability was determined using data from the World Bank worldwide governance indicators. Specifically, the index reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism. These data were standardised between 0 and 1.

Source: World Bank http://info.worldbank.org/governance/wgi/index.aspx#home

Shannon-Wiener and political stability indices were multiplied and summed:

$$\sum_{i=1}^{n} -x_i ln(x_i) b_i$$

Where b is an index of political stability of producing country. This is called the SWNI (Shannon-Weiner-Neumann index), in line with previous work. Each SWNI index was normalised between 0 and 1, in order to have a standardised index. This was done by working out a maximum diversity score, by assuming maximum diversity was equivalent to importing products in line with proportional contributions of exporting countries (e.g. if a single country were responsible for exporting 50 per cent of all natural gas, and five other countries were responsible for 10 per cent each, we assumed maximum import diversity at a ratio of 5:1:1:1:1:1). This maximum diversity score then acted as our upper score of 1, with all other scores divided by this maximum to standardise the data.

Other sources of gas

Sometimes, due to a variety of reasons, countries may report an import of natural gas from a “Non-Specified/ Other” source country. Border Point Data was used to reallocate imports for Austria, Hungary, Poland, Republic of Moldova, Slovak Republic, and Ukraine, which is available at https://www.iea.org/data-and-statistics/data-product/gas-trade-flows#gas-trade-flows. This data is collected by the IEA and shows monthly gas flows in Europe.

This publication is available from: https://www.gov.uk/government/collections/energy-trends

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Electricity generation and supply in Scotland, Wales, Northern Ireland, and England, 2020 to 2024

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Introduction

This article examines the variation of electricity generation and consumption in the four nations of the United Kingdom. It updates and extends the previous version, published in December 2024. The UK data in this article is taken from chapters 5 and 6 of the Digest of United Kingdom Energy Statistics (DUKES) 2025 and the definitions match those in DUKES. The main text covers the latest five years of data and the corresponding timeseries (including the latest revisions) for 2004 to 2024 can be found in the accompanying Excel spreadsheet.

Key headlines

- UK total electricity generation in 2024 was 285 TWh, a decrease of 3.1 per cent compared to 2023. This is the lowest electricity generation on the published data series.
- UK renewable generation surpassed 50 per cent of total generation for the first time. Trends were mixed across the nations with decreased renewable generation in Wales and Northern Ireland but increases for England and Scotland.
- UK fossil fuel generation decreased by 16 per cent compared to 2023. The last coal-fired power plant closed in September 2024. All regions except Northern Ireland saw a fall.
- UK nuclear generation remained similar to 2023 but was the lowest value on the published data series, due to continued maintenance and refuelling outages.
- The low carbon share of total UK generation stood at its highest value on the time series at 64.7 per cent, with a 62.6 per cent share in England, 90.0 per cent in Scotland, 33.5 per cent in Wales, and 44.1 per cent in Northern Ireland.
- Net imports of electricity to the UK from Europe totalled a record 33.4 TWh in 2024, with imports from Europe also reaching a record in the published data series due to favourable price differentials.

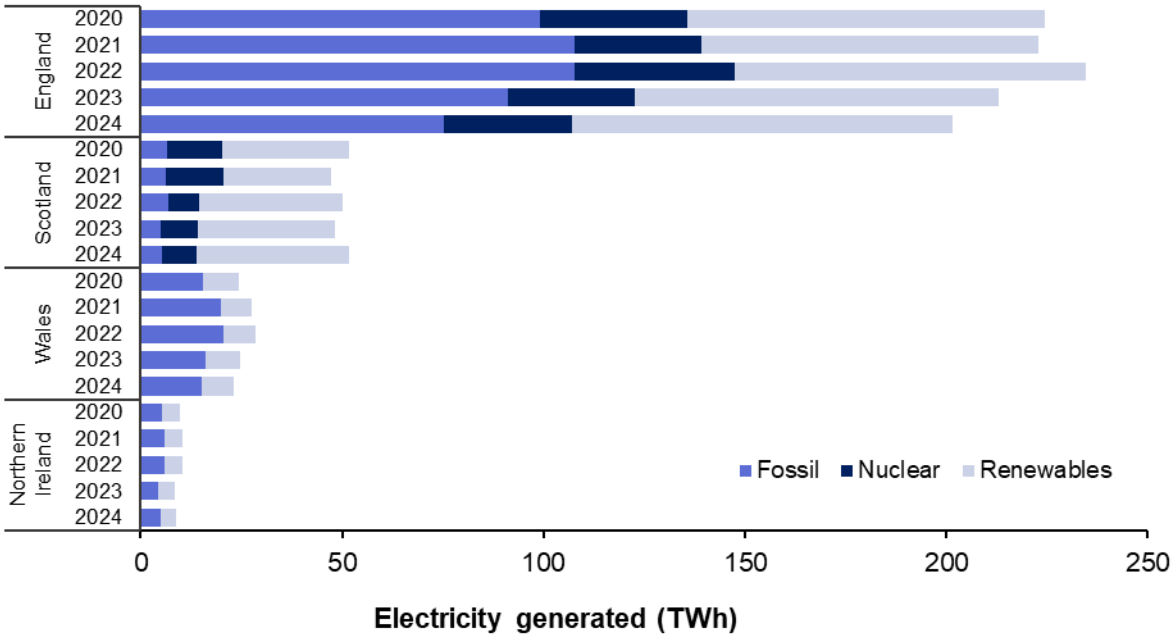
Generation, consumption, and trade

During 2024, the UK generated 285 TWh of electricity. This was a decrease of 3.1 per cent compared to 2023 and was the lowest UK generation figure on the published data series. This was due in part to favourable price differentials across interconnectors which led to increased electricity imports from Europe, displacing domestic gas generation. Demand increased from 317 TWh to 319 TWh, similar to 2022 levels. Generation has been on a downward trend since 2016, except for a year-on-year increase in 2022 when nuclear outages in France led to increased UK generation for exports.

From 2023 to 2024, Scotland and Northern Ireland saw increases in electricity generation, while England and Wales decreased. Scotland increased by 7.7 per cent and Northern Ireland increased by 4.1 per cent. England decreased by 5.4 per cent and Wales decreased by 6.7 per cent from 2023's figure. Chart 1 shows total electricity generation by country, between 2020 and 2024, with generation split by fossil fuel, nuclear and renewable technologies.

Whilst demand for electricity increased by 0.5 per cent from 2023 to 2024, generation fell in line with increased net imports from Europe. The rise in demand (includes losses and generator's use) is reflective of increased consumption of electricity, as seen in the regional tables. This rose 0.8 per cent to 272 TWh.

Chart 1: Total electricity generation by country (all generating companies), 2020 to 2024



Shares of electricity generated by nation remained similar to the previous year, with England generating the largest share at 70.7 per cent, falling by 1.7 percentage points relative to 2023 with lower fossil fuel generation. Scotland, driven by increased wind generation, accounted for the second largest share at 18.2 per cent, increasing by 1.8 percentage points. Wales's share decreased to 8.0 per cent, by 0.3 percentage points. Northern Ireland's share increased by 0.2 percentage points to 3.1 per cent.

UK fossil fuel generation decreased by 16 per cent from 2023 to 2024, to 91 TWh. This was the lowest figure on the published data series for the second consecutive year. The share of generation from fossil fuels has fallen each year since 2021, reaching 31.8 per cent in 2024 – a 4.8 percentage point drop on 2023. This year-on-year decrease in fossil fuel use reflects increased wind and solar capacity and reduced total generation due to higher net imports. England had the largest year-on-year decrease in fossil fuel generation, down 19 per cent to 69 TWh. Northern Ireland increased 14 per cent to 4.9 TWh but remained lower than in 2022. Wales saw a decrease of 7.4 per cent to 14 TWh while Scotland saw a 4.5 per cent decrease to 3.6 TWh. The last UK coal-fired power station closed in England in September 2024. Gas fired generation fell in all regions except Northern Ireland, where domestic gas generation displaced imports. Gas-fired generation accounted for the majority of fossil fuel generation - a 30.4 per cent share of total generation in 2024, down 4.2 percentage points. Coal-fired generation fell 46 per cent and totalled 2.0 TWh, a 0.7 per cent share. Oil was used to generate 1.8 TWh of electricity, a fall of 9.3 per cent to a 0.6 per cent share.

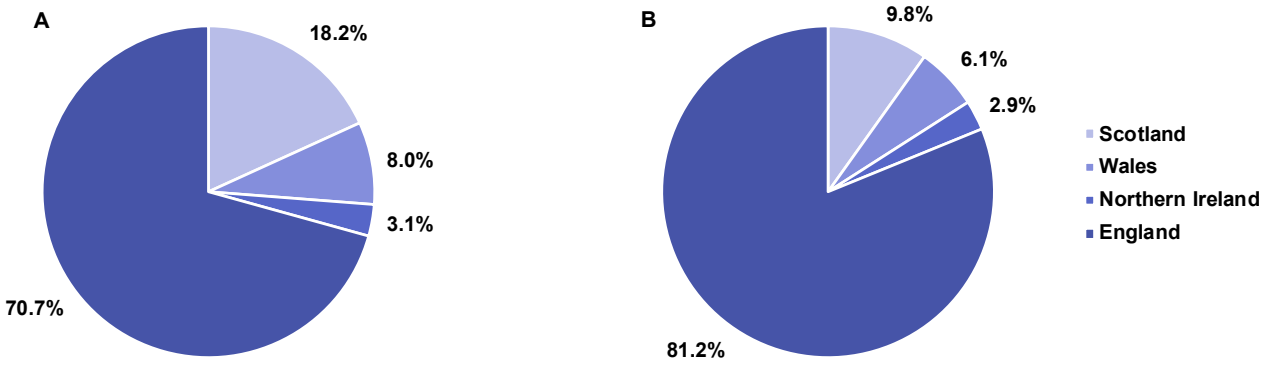
UK nuclear generation remained similar to 2023, at 40.6 TWh - 14.2 per cent of total UK generation. Scotland and England are the only nations with nuclear power plants. There has been no nuclear generation in Wales since the closure of Wylfa in Wales in 2015. Regional nuclear generation also remained relatively consistent from 2023, with Scotland falling 3.6 per cent to 8.7 TWh and England rising 1.0 per cent to 32 TWh.

Renewable generation surpassed 50 per cent of total generation for the first time, increasing by 5.1 per cent on 2023 to a record 144 TWh in 2024. Alongside lower total and fossil fuel generation, renewables' share of generation rose 3.9 percentage points to 50.4 per cent. While average daily sun hours were lower and average wind speeds similar to 2023 [ET Ch.7], renewable generation benefitted from increased capacity in 2024, including approximately another 1 GW of installed wind capacity and 2 GW of solar [ET 6.1]. England and Scotland accounted for the majority of renewable generation and both increased, while there were slight drops in Wales and Northern Ireland.

Shares of annual electricity consumption of the respective UK nations did not vary much from 2023 and have been relatively consistent across the reported data series. The majority of consumption came from England (81.2 per cent), 9.8 per cent from Scotland, 6.1 per cent from Wales and 2.9 per cent from Northern Ireland. Scotland and Wales supply more than they consume, whereas the reverse is true for England.

Northern Ireland's shares are similar for supply and consumption. Chart 2 shows shares of electricity supply and consumption in the UK by country in 2024.

Chart 2: Shares of electricity supply (A) and consumption (B) in the UK by country in 2024



International exports and transfers

The UK continued as a net importer of electricity in 2024, reaching a time series record of 33 TWh of net imports from Europe. This was primarily due to electricity price differentials between interconnected countries making interconnectors a cheaper source of electricity compared to the more expensive types of UK based generation. The UK transfers electricity to Europe via interconnectors with France, Netherlands, Belgium, the Republic of Ireland, Norway and Denmark. Between 2020 and 2024, four new UK-Europe interconnectors became operational. Atypically, the UK was a net exporter in 2022, when the French nuclear fleet suffered from increased outages. Of the four countries, England was the largest importer of electricity from Europe due to interconnector locations. Although the UK as a whole was a net importer from Europe, Wales and Northern Ireland were net exporters to Europe as they host interconnectors with the Republic of Ireland. Wales transferred 2.7 TWh and Northern Ireland transferred 2.4 TWh of electricity to Europe. Scotland transferred 17 TWh of electricity to England as well as 2.5 TWh to Northern Ireland.

Transfers and trade between countries is complex as it varies depending on the generation mix at any given time and the price differentials across interconnectors. Transfers and trading patterns are ascribed to the country or nation where the interconnector is located, but this cannot reflect the full complexity of how electricity flows between countries. A Sankey diagram illustrating flows in electricity generation, consumption and trade in the UK nations is provided in Appendix A.

Electricity generation by fuel

In recent years the closure of coal and gas fired power stations and an increase in the capacity of renewable generators has shifted the UK's mix of generation from fossil fuels towards renewables. This is the third year in a row that renewable generation had a greater share than fossil fuels across electricity generation for the UK. The difference between the shares has also increased since 2022, with a difference of 18.7 percentage points in 2024. The fossil fuel share of total generation has fallen from 38.4 per cent in 2020 to 31.8 per cent in 2024, while renewables' share rose from 43.1 per cent in 2020 to 50.4 per cent in 2024. Low average wind speeds disrupted this trend in 2021. UK gas generation fell by 29 per cent from 2020 to 2024, compared to the biggest renewable fuel, wind, which increased by 10 per cent through the same period. While noting an increase in fossil fuel generation in 2021 and 2022, no nations generated more from fossil fuels in 2024 than 2020.

Coal-fired generation's share of UK electricity was only 0.7 per cent in 2024, a record low. This was a steep decline from 2012 when coal accounted for 39.2 per cent of the UK mix and followed a range of policies including the introduction of the Carbon Price Floor (CPF) in April 2013. In September 2024, Ratcliffe-on-Soar, the last coal-fired power station in the UK, closed. This followed West Burton A and Drax's final two coal units closing in 2023 while Kilroot converted from coal to gas-fired generation. Coal generation was down 39 per cent in England year-on-year as well as being down 95 per cent in Northern Ireland. Scotland and Wales no longer have any coal-fired stations.

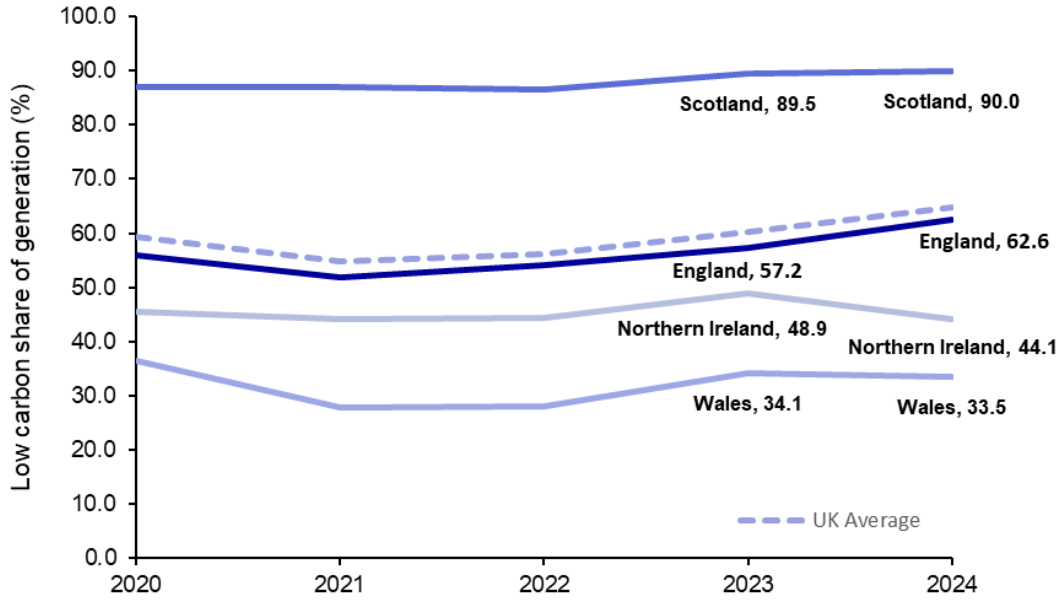
Gas had largely replaced coal in the generation mix since the introduction of the CPF. UK gas generation decreased to 87 TWh in 2024, though remained the single fuel with the highest generation figure, just ahead of wind generation. Gas generation in the UK has declined considerably in the last decade, decreasing by 29 per cent compared to 2020. 2021 saw increased gas generation as electricity demand recovered post-covid lockdown and in 2022 when more was generated to export, during the outages in the French nuclear fleet. All regions except Northern Ireland saw decreases in gas generation from 2023 to 2024, where gas generation was favoured to imports. England saw a significant drop of 19 per cent to 66 TWh in 2024 compared with 2023 and was 26 per cent lower than 2020 levels, while Wales and Northern Ireland remained at broadly similar levels to 2020. Scotland generated the least from gas in 2024 – the 3.0 TWh the result of a 45 per cent drop from 2020 levels.

The UK's nuclear generation plateaued in 2024 after a downward trend since 2020, noting a small increase in 2022. Nuclear generation fell 19 per cent to 41 TWh between 2020 and 2024, with ongoing outages as a result of aging infrastructure. On a regional level, generation remained similar to 2023, with Scotland seeing a slight fall and England a slight rise. Since the closure of Wylfa in 2015 there has been no nuclear generation in Wales.

UK low carbon generation reached a record share of 64.7 per cent of total generation. Low carbon generation increased 3.9 per cent compared to 2023, from 177 TWh to 184 TWh. This was driven by the increase in renewable generation, while nuclear remained similar. The increase in low carbon generation paired with the decrease in total generation meant that low carbon's share of total generation rose 4.4 percentage points to 64.7 per cent. The share of low carbon generation within each nation followed a similar pattern to 2023, but with the largest change coming in England, where the share rose 5.4 percentage points to a record 62.6 per cent. Scotland also saw an increase in low carbon share, reaching 90.0 per cent, while Northern Ireland and Wales fell to 44.1 per cent and 33.5 per cent respectively.

Chart 3 shows the renewable share of total electricity generation in each UK country from 2020 to 2024, in comparison to the UK average.

Chart 3: Low carbon share of electricity generation by country, 2020 to 2024

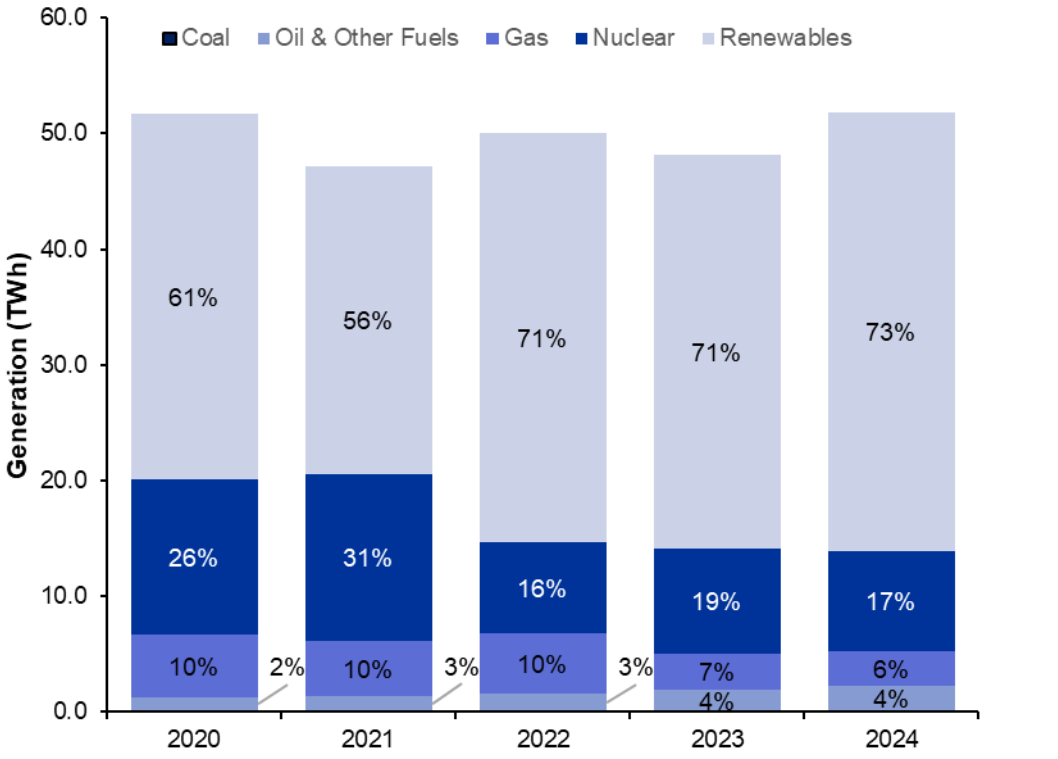


A map illustrating the distribution of Major Power Producers in Scotland, Wales, Northern Ireland and England is provided in Appendix B.

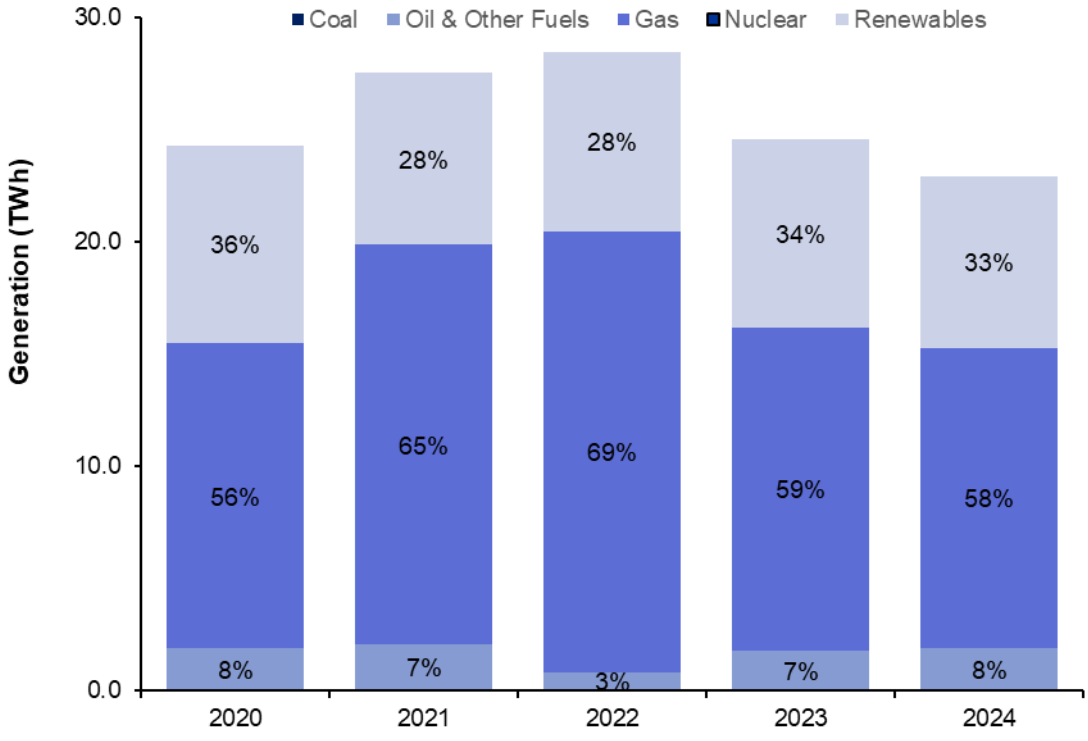
Chart 4 shows electricity generation by fuel (for all generators) in each UK country from 2020 to 2024. To illustrate the generation mix in each country, shares of electricity generated by fuel are shown as data labels.

Chart 4: Electricity generation by fuel (with shares of electricity generated) in all generating companies, in Scotland (A), Wales (B), Northern Ireland (C) and England (D), 2020 to 2024

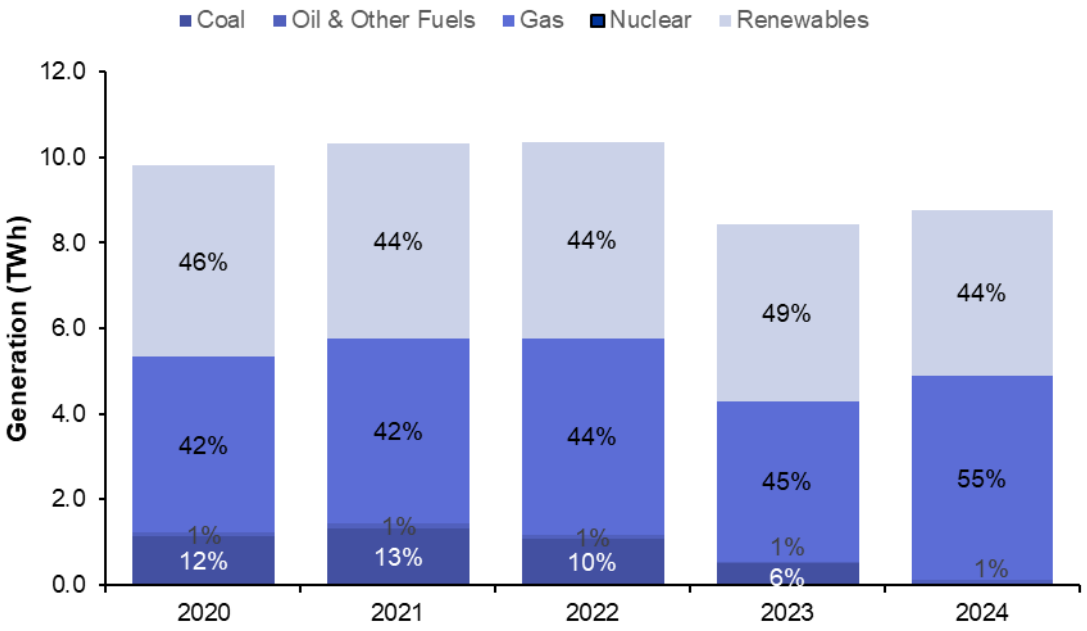
A - Scotland



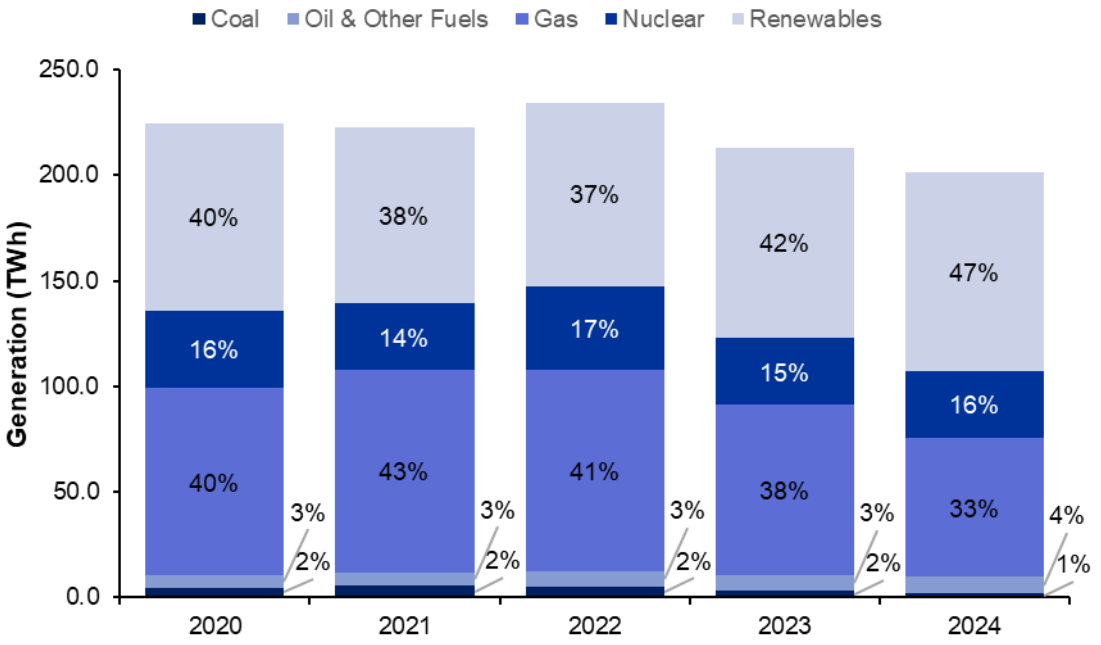
B – Wales



C – Northern Ireland



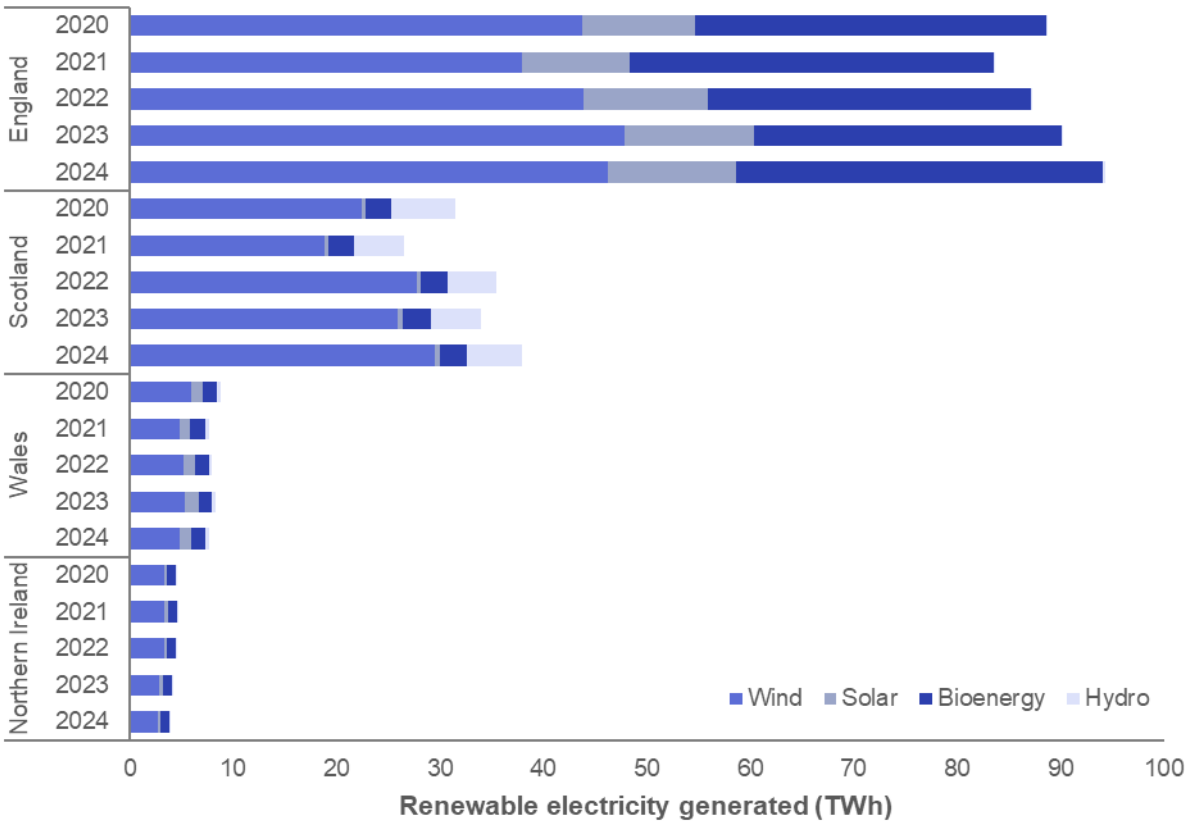
D – England



Low carbon and renewable electricity

Renewable electricity generation and capacity has increased dramatically in recent years, as the UK strives towards a cleaner future, working towards its goal to achieve net zero carbon emissions by 2050. The Clean Power 2030 Action Plan states that in a typical weather year, the 2030 power system will see clean sources produce at least as much power as Great Britain consumes in total. Chart 5 shows electricity generation by renewable technology in each UK nation between 2020 and 2024.

Chart 5: Renewable electricity generation by technology, in each UK nation between 2020 and 2024



Wind had the largest generation of the renewable technologies at 83 TWh in 2024, with generation increasing by 1.4 per cent compared to 2023, as cumulative installed capacity increased by 6.4 per cent while average UK wind speeds were 0.1 knots higher in 2024. Wind power accounted for 56.9 per cent of Scotland's generation in 2024, the highest wind share for any nation and more than double the proportion of English and Welsh wind generation (23.0 per cent and 21.0 per cent respectively). Wind generation fell in all regions except Scotland, which had the largest growth in capacity as Moray West, Viking Wind Farm, NNG and others came online in 2024.

Bioenergy was the second largest category of renewable generation in 2024, at 14.1 per cent of total generation. Since the conversion of coal units at Lynemouth and Drax to biomass in 2018, most bioenergy generation by major power producers takes place at these two sites, which are both in England. UK bioenergy generation increased 17 per cent in 2024, with a notable increase in Drax's generation, as well as from other generators. England is responsible for most of the UK's bioenergy generation and accounted for 35 TWh in 2024, up 19 per cent. The generation in Scotland, Wales and Northern Ireland remained similar to 2023 levels. Bioenergy installed capacity in the UK was slightly larger in 2024 but broadly similar.

Solar generation remained at a similar level from 2023 in 2024, falling 1.9 per cent. There was a noticeable 13 per cent growth in installed solar capacity between 2023 and 2024, the majority in England. Average daily sun hours were 0.5 hours lower than in 2023, and considerably below the 20-year mean, offsetting the newly installed capacity. Compared with 2020 levels, all regions except Northern Ireland saw an increase in solar generation, with England accounting for the majority of the annual totals. English solar generation rose 14 per cent from 2020, reaching 12 TWh in 2024.

The vast majority of the UK's **hydro** generation assets are in Scotland. There were minimal changes in capacity but higher average monthly rainfall in quarter 2 of 2024 meant more consistent generation. Hydro generation increased by 6.1 per cent across the UK, with an increase of 7.1 per cent in Scotland.

Further Details

For further detailed renewable statistics on a sub-national and regional basis, please refer to the September 2025 issue of Energy Trends. For weather data, weighted by location of renewable resources, refer to Energy Trends section 7: weather.

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Revisions

Data for 2022-2024 have been revised in line with the latest Digest of UK Energy Statistics. Previous versions of the data in this article remain available online for comparison at:
www.gov.uk/government/collections/energy-trends-articles

References

Digest of UK Energy Statistics 2025 (DUKES) – Electricity (Chapter 5):
https://www.gov.uk/government/statistics/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes

Electricity Statistics: data sources and methodologies
https://www.gov.uk/government/publications/electricity-statistics-data-sources-and-methodologies

Electricity generation and supply article and accompanying data for Scotland, Wales, Northern Ireland and England, 2020 to 2024:
https://www.gov.uk/government/publications/energy-trends-december-2025-special-feature-articles

UK electricity generation and consumption (Energy Trends 5.1 to 5.6):
https://www.gov.uk/government/statistics/electricity-section-5-energy-trends

Renewable electricity generation and capacity (Energy Trends 6.1):
https://www.gov.uk/government/statistics/energy-trends-section-6-renewables

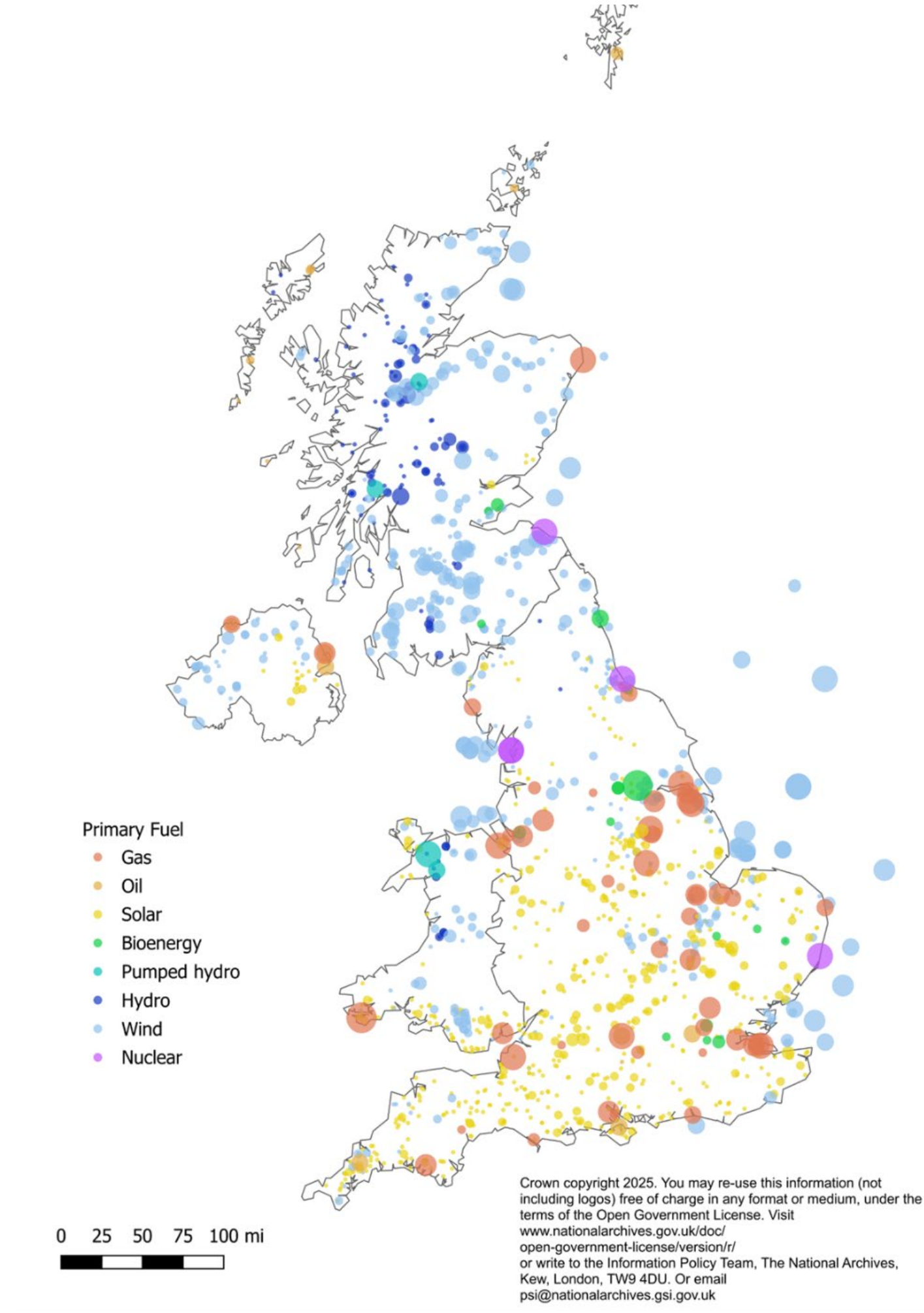
Renewable electricity in Scotland, Wales, Northern Ireland and the regions of England in 2024
https://www.gov.uk/government/publications/energy-trends-september-2025-special-feature-articles

Energy Trends: Weather
www.gov.uk/government/statistics/energy-trends-section-7-weather

Appendices

Appendix A: Electricity generation and consumption in Scotland, Wales, Northern Ireland and England

Appendix B: Distribution of Major Power Producers (MPPs) in the United Kingdom (as of May 2025)



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Feed-in Tariff load factor analysis

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Key headlines

Median load factors for solar, wind and hydro installations decreased in 2024/25. Unfavourable weather conditions were the main driver, with less wind, sunshine and rainfall this financial year.

The median load factor for solar photovoltaic (PV) decreased to 9.2 per cent in 2024/25. This is the lowest recorded median in the time series. Average sun hours in 2024/25 were down on the previous year and were at their lowest since 2012/13.

The median load factor for wind was 18.7 per cent in 2024/25, a 1.4 percentage points decrease with respect to 2023/24 due in part to a fall in average wind speed.

Like last year, **South West and East of England had the highest median load factor for solar PV,** while **Scotland had the highest wind load factor** for the ninth year in a row. Wind load factors exhibit greater regional variability than solar load factors.

Background

This article analyses load factors of small-scale renewable installations accredited under the Feed-in Tariff (FiT) scheme[1]. The Feed in Tariff scheme supports small-scale renewable generation, up to 5 MW. See Appendix 1 for more details. Around 25 per cent of solar, 2 per cent of wind, 12 per cent of hydro and 46 per cent of anaerobic digestion capacity is supported by FiTs.

Load factors are a measure of the efficiency of electricity generation. A load factor is the amount of electricity generated by a system over a certain period expressed as a proportion of its maximum possible output.

For each financial year since 2011/12 (the second year of the FiT scheme), we provide an update on national load factors for all technologies, as well as regional load factors for solar PV and Wind installations, and quarterly national load factors for solar PV, Wind and Hydro schemes. Detailed tables are available as an Excel workbook, at: https://www.gov.uk/government/publications/quarterly-and-annual-load-factors

In the financial year 2024/2025, 285,443 installations had a valid annual load factor and were included in the analysis. This is a third of all FiT installations, which is broadly in line with the sample size previous years. See the Technical Notes in Appendix 1 for more details.

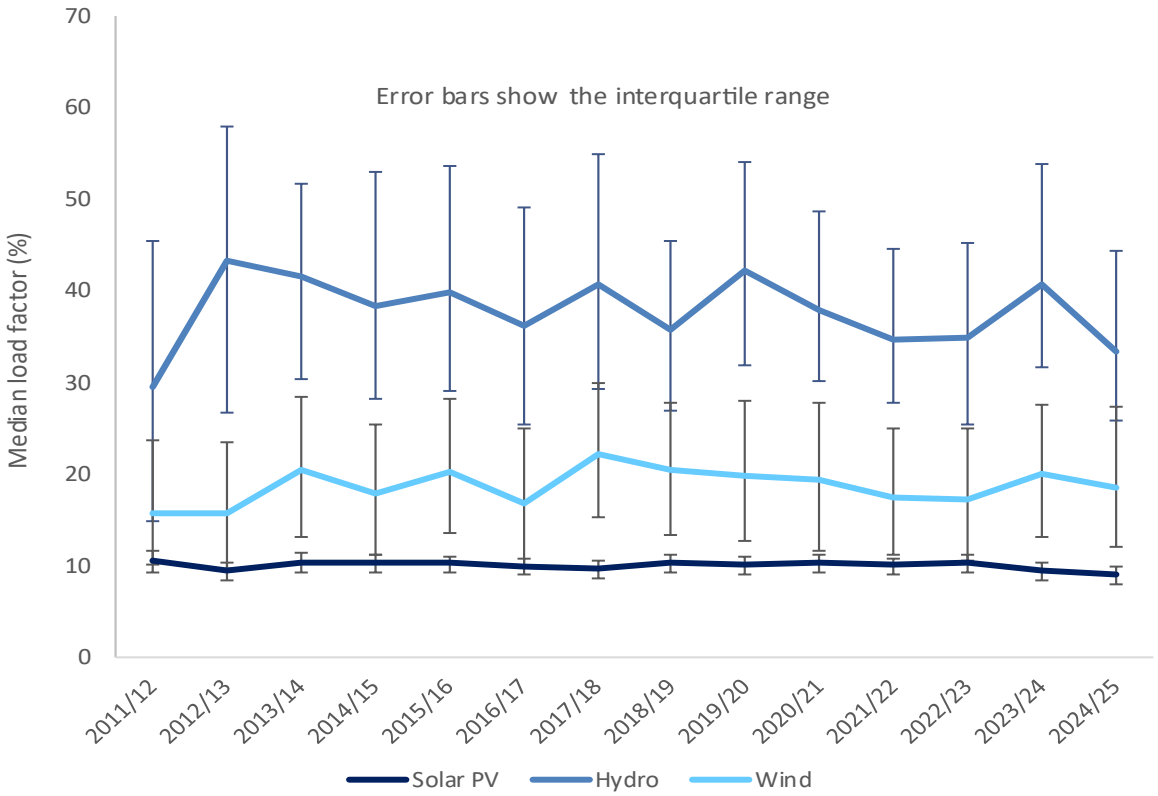
Results

Chart 1 below shows the annual load factors for the leading technologies (hydro, wind, and solar PV) over the FiT years. We present load factors on a line plot for each technology and year, displaying their median value and the interquartile ranges as a measure of dispersion around it.

The plot highlights the differences between the technologies: although primary renewables are all dependent on weather conditions, the distribution of load factors around their median repeats across the years and has a different spread for each technology. While load factors for solar PV are more concentrated, hydro and wind load factors exhibit a wider spread and a wider range of values can be observed. Fluctuating sample sizes may also influence the distribution year on year; solar PV has the largest sample size each year.

[1] More details here: www.ofgem.gov.uk/environmental-and-social-schemes/feed-tariffs-fit

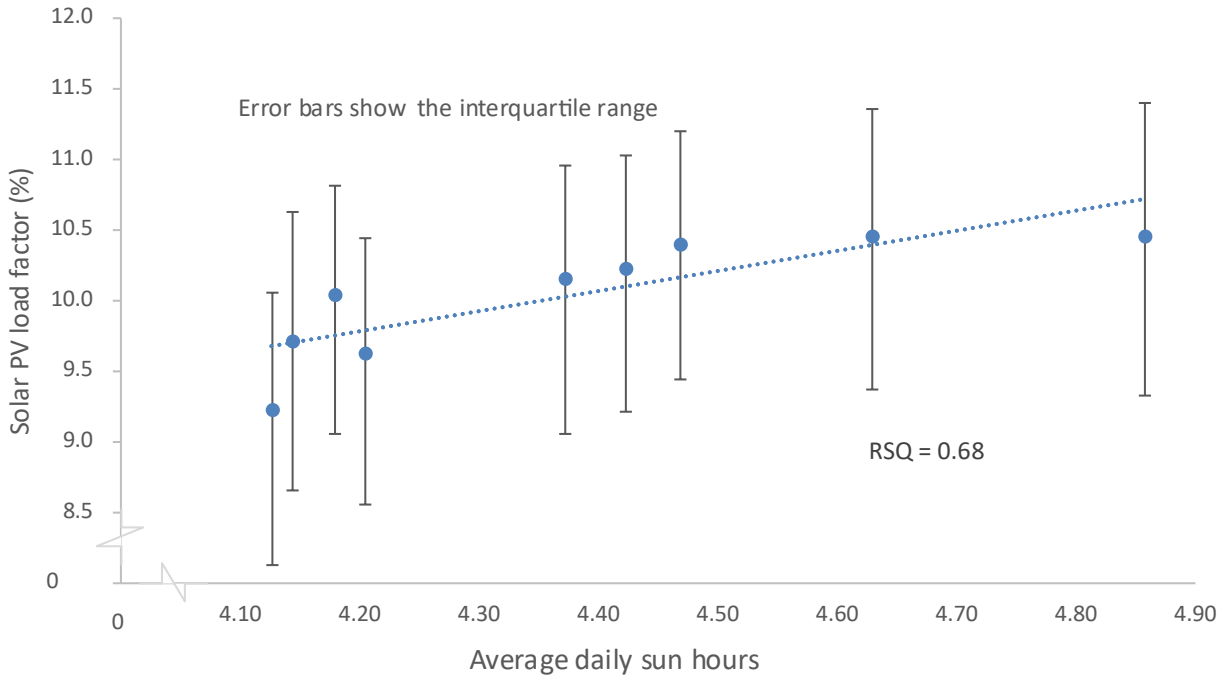
Chart 1: Hydro, Wind and Solar PV load factors, 2011/12-2024/25



The median load factor for solar PV in 2024/25 was 9.2 per cent, 0.4 percentage points lower than in 2023/24; this was due to shorter average sun hours which were down by around 2 per cent over the course of the year and at their lowest level since 2012/13. The weighted mean was 8.3 per cent, also down on last year. The weighted mean is typically lower than the median, but the difference is small in relative terms; this suggests that the efficiency of solar PV installations is less dependent on their size than other technologies, although small scale installations (less than 50 kW) account for around two thirds of accredited capacity and may skew mean load factors towards the lower end.

The load factors for solar PV show a close relationship with average sunlight hours, with patterns repeating in the two series (see Chart 2 below).

Chart 2: Solar PV load factors and average sun hours, 2016/17-2024/25



In 2024/25, the median load factor for Wind was 18.7 per cent, a 1.4 percentage points decrease on 2023/24, due in part to a 2.5 per cent decrease in average wind speeds over the year. As in previous years, the weighted mean of the load factor for wind is notably higher than the median and tends to be more closely related to the average wind speeds. In 2024/25 the weighted mean was 24.6, a small decrease on 25.2 in 2023/24. The difference between the median and weighted mean generally reflects that larger wind farms are more efficient, and therefore skew the mean load factor towards higher values.

There is a relationship between annual wind speed and wind load factors, but it is weaker than the relationship between solar PV and sun hours. Load factors for wind vary more than those for solar PV throughout the year, with percentiles spreading further away from the median. It is also worth noting that wind speeds can vary considerably by location and by height above the ground, making an accurate nationwide analysis more difficult to achieve.

The median load factor for hydro in 2024/25 was 33.6 per cent, a decrease of 7.2 percentage points on the previous year, mostly as a result of a 12 per cent decrease in average rainfall. Load factors for hydro tend to vary a lot within the sample.

The median load factor for anaerobic digestion was 74.8 per cent in 2024/25. This is the lowest in the time series, and possibly down to the lower level of coverage for this year- only 41 per cent of installations have been included this year compared to over half in the previous three years.

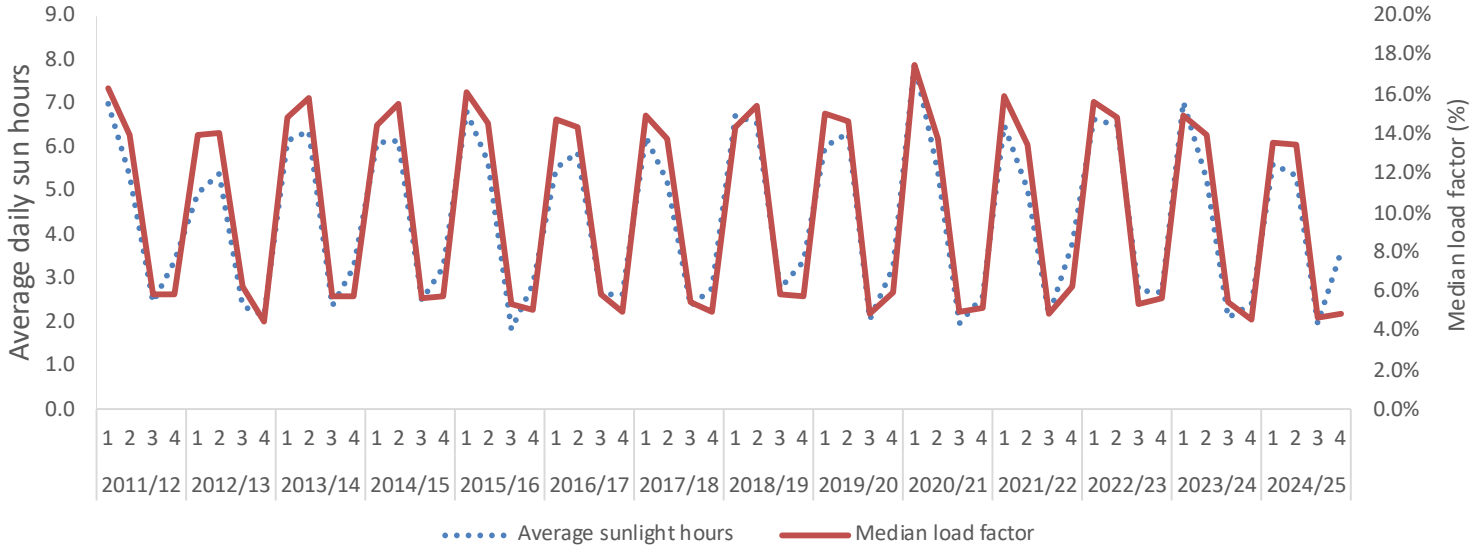
Quarterly load factors

The load factors for solar PV, wind and hydro follow a seasonal pattern due to weather conditions, with high load factors for hydro and wind being associated with wetter, windier autumn and winter months, and solar PV load factors being higher in spring and summer months.

Chart 3 below shows quarterly load factors for Solar PV compared to average sunlight hours. As expected, there is a strong association between sunnier seasons and higher load factors. Solar PV generation is boosted when the sun shines for longer and is weaker in winter months.

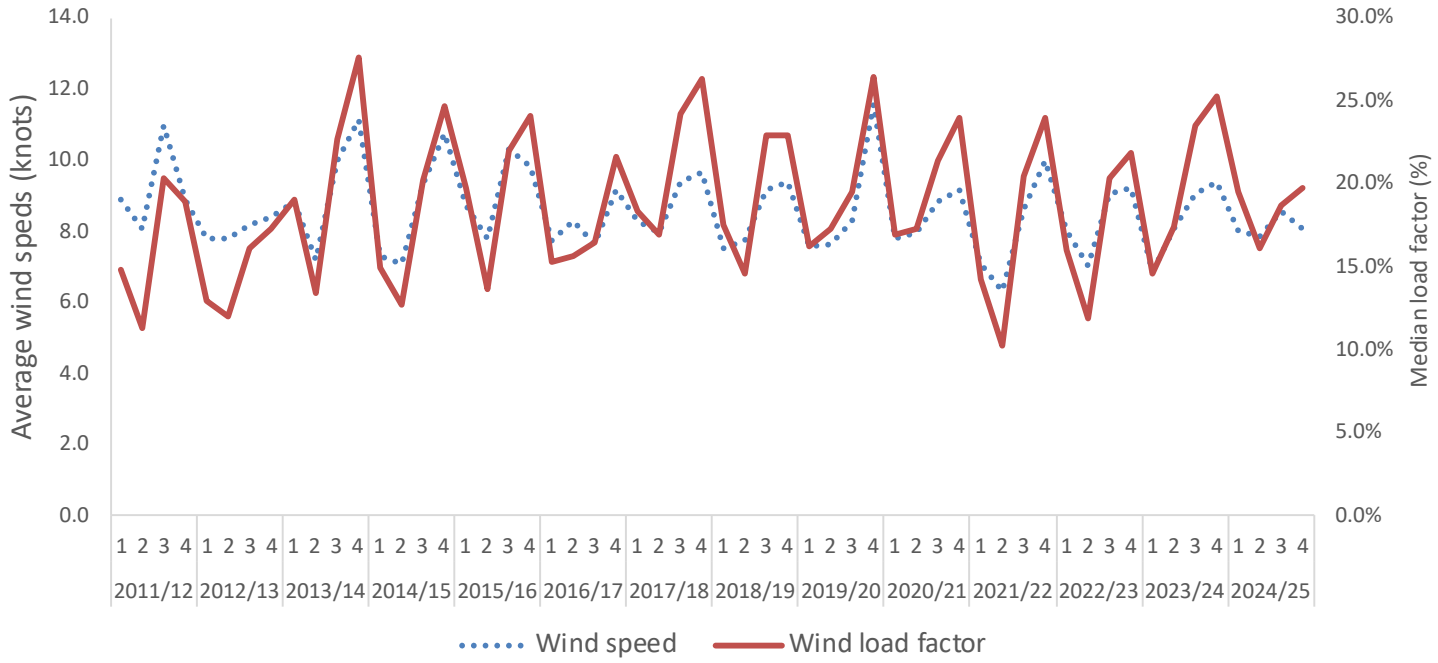
In 2024/25, the spring quarter (April - June 2024) had the highest load factor of the year (13.6 per cent), which has often been the case over the previous ten years; the sun's irradiance is at its highest in June. However, this was the lowest load factor for the spring quarter in any year in the time series. The lowest load factor of 4.7 per cent was observed between October and December, the lowest for this quarter in any year and reflects fewer sun hours during this period.

Chart 3: Quarterly Solar PV load factors by FIT year



Wind load factors also follow a regular quarterly pattern. Chart 4 displays a line plot of wind load factors across the quarters since 2011 against average wind speed. Except for some discrepancies in the early years, load factors have mirrored wind speed quite closely, reaching their maximum during the winter months in most years.

Chart 4: Average wind load factors and wind speeds by quarter

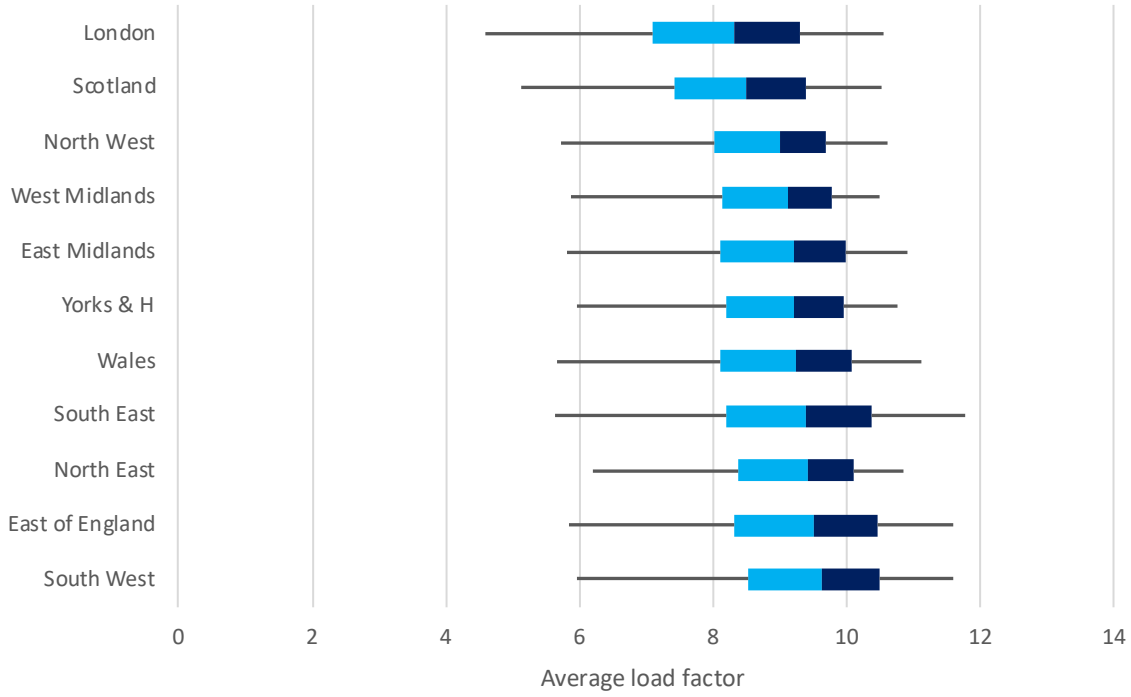


For hydro, wetter seasons are associated with higher load factors, though the relationship between weather and load factors is less strong than it is for wind or solar PV.

Regional Solar PV load factors

Chart 5 is a box-and-whiskers plot showing PV load factor for Scotland, Wales, and each region of England in 2024/25. The median load factor varies across regions, but the distributions are similar from region to region.

Chart 5: Solar PV regional load factors for 2024/25.



In 2024/25, South West England had the highest load factor, closely followed by the East of England and North East, all at around 9.5 per cent. The same regions typically have the highest average load factors. London had the lowest median load factor in 2024/25, followed by Scotland and North West England. London typically has one of the lowest regional load factors; this may be due to pollution particles settling on the panels, or because panels are shaded by tall buildings nearby. Every region showed a decrease in median load factors when compared to the previous year, except for the North East, which increased slightly.

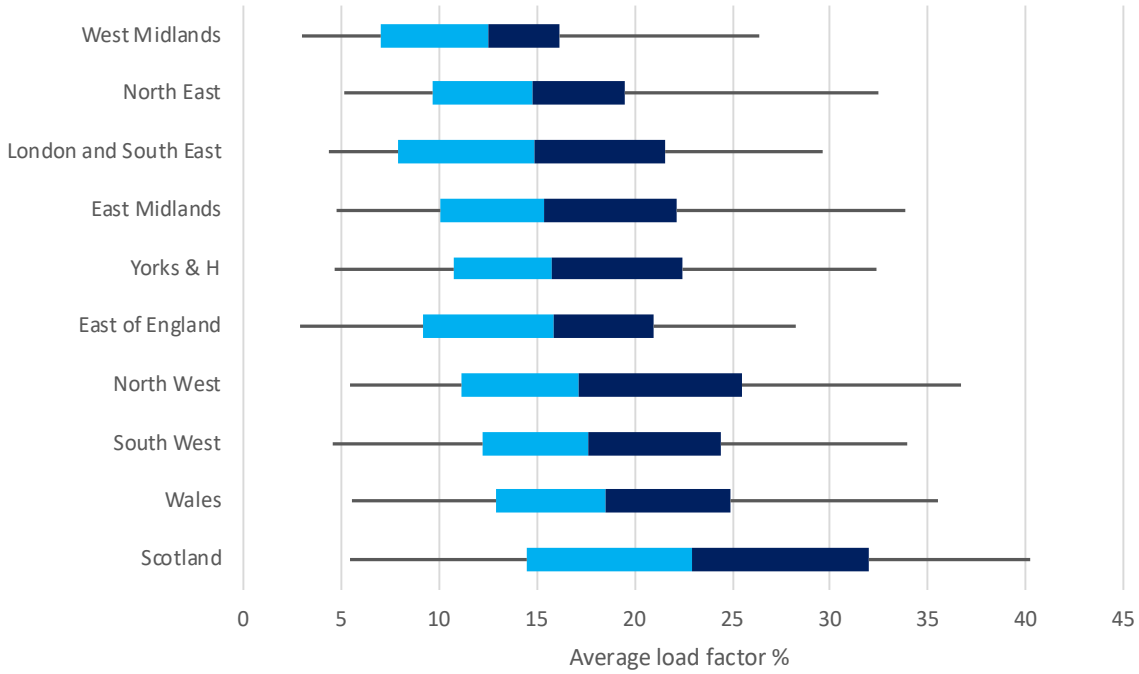
Regional Wind load factors

Chart 6 below shows wind load factors in a box-and-whiskers plot for each region. Data from London and the South East are aggregated due to the low number of installations with a valid load factor in these regions.

In the latest year, **Scotland had the highest median load factor for wind at 22.9 per cent**, followed by Wales and South West. Scotland has had the highest median load factor for wind in every year of the time series except 2015/16. Every region except North East England showed a decrease in median load factor in 2024/25.

Unlike solar PV, load factors for wind appear to follow different distributions across different regions, although the overall spreads are comparable. West-facing coastal regions tend to report higher load factors more frequently than central and easterly regions. Moreover, regions with a lower median load factor are less likely to report extreme load factors. This suggests that wind load factors have a stronger geographic dependence than solar PV load factors.

Chart 6: Wind regional load factors for FITs 2024/25



Appendix 1: Technical notes

The Feed-in Tariff scheme was launched in April 2010. It is managed by Ofgem. It is a financial support scheme for eligible low-carbon electricity technologies, aimed at small-scale installations. The following technologies are supported:

- Solar photovoltaic (up to 5 MW capacity)
- Anaerobic digestion (up to 5 MW capacity)
- Hydro (up to 5 MW capacity)
- Wind (up to 5 MW capacity)
- Micro Combined Heat & Power (Micro CHP, up to 2 kW capacity)

Some generators receive financial support for generating electricity and some for exporting electricity, depending on the tariff which they are on. The generation tariff is based on the number of Kilowatt hours (kWh) generated whereas the export tariff is based on electricity that is generated on site, not used, and exported back to the grid. The FIT scheme closed to new entrants at the end of March 2019, though a grace period has been allowed to a small number of installations since then. Accredited generators continue to receive support for 20 years from the date they were commissioned (10 years for micro-CHP, 25 years for solar PV commissioned prior to August 2012).

Data cleansing

Table 1 shows how many installations were registered on the Central Feed-in Tariff Register at the start of FIT 2024/25 and how many installations had valid meter readings; to be included in the analysis, each installation was required to have meter reading taken sufficiently close to April 1st, 2024, and a corresponding reading approximately one year later.

Of the 869,446 schemes registered for FiTs at the start of the financial year[2], 33 per cent were found to have sufficient meter readings for the annual analysis. Extreme load factor values were then excluded (as in previous years' analysis), accounting for around 3,400 (0.4 per cent) of installations. The column 'Valid load factor' in Table 1 indicates how many installations were included in the final annual analysis for each technology. Micro CHP statistics are no longer included in this release as there are few installations remaining which are still in support of FIT support.

The headline coverage is always lower in the most recent survey year, due to the absence of a final meter reading for many installations. In the 2022 publication, we introduced a new method whereby closing readings for the previous year's analysis are added to the data set which increases the sample size for that year, making the results more robust. See the methodology annex in the December 2022 edition of this article[3]. Therefore, we have revised the results for 2023/24 by supplementing the data with this year's data. This has added 140,000 more installations with valid readings to the analysis. We have also received additional data for the 2023/24 financial year which has allowed us to revise the results for 2022/23, adding over 5,000 valid readings to the analysis.

[2] Excluding Micro CHP and subject to further revision.

[3] The article published in December 2022 can be found at the following link (opens in a new window)

Table 1: Installations included in analysis by technology – 2024/25

Technology	Commissioned by 31st March 2021	Generation Data Reported*	Valid load factor	% remaining in analysis
Anaerobic digestion	427	216	175	41%
Hydro	1,206	551	500	41%
Photovoltaic	860,252	284,954	282,047	33%
Wind	7,561	3,119	2,721	36%
All Technologies	**869,446**	**288,840**	**285,443**	**33%**

For this year's edition, we have revised the data for 2022/23 and 2023/24. This is because more data is available by using meter readings from the latest survey which were taken on or around March 31st 2024. Likewise, it is likely that the sample size for 2024/25 will increase in next year's publication, in which case the load factors will be revised.

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