Department for Business, Energy & Industrial Strategy

Energy Trends

UK, April to June 2022

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 2 2021, primary energy basis

(mtoe basis)	Production	Imports	Exports	Demand
Total energy	**+21%**	**+11%**	**+52%**	**0.0%**
Coal	**-48%**	**+37%**	**-25%**	**-19%**
Primary oil	**+10%**	**+3.3%**	**-2.4%**	**+16%**
Petroleum products	**+13%**	**+26%**	**+25%**	**+15%**
Gas	**+55%**	**+17%**	**+576%**	**-10%**
Electricity	**+19%**	**-68%**	**+568%**	**+19%**

- **UK energy production increased** on last year's record low which saw oil and gas production affected by maintenance. Natural gas production increased by more than 50 per cent and oil production increased by 10 per cent. Low carbon energy also increased.
- **Total final energy consumption was 0.2 per cent lower** than in the second quarter of 2021, as warmer temperatures decreased demand and offset increased activity in the economy. Transport consumption rose by 23 per cent with petrol and diesel consumption returning to near pre-pandemic levels. Domestic consumption fell by 28 per cent due to warmer weather and a decrease in the amount of time working at home.
- **Exports of gas reached a new quarterly high** as imports of Liquified Natural Gas (LNG) arriving in the UK helped supply Belgium and the Netherlands. **Electricity exports also reached a new record high** with the UK becoming a net exporter of electricity for the first time since 2010.
- **Energy received from Russia decreased on the same quarter of last year.** With no LNG cargoes arriving from Russia, Russia's share of the UK's gas imports fell from 7.6 per cent last year to 0. Russia's share of the UK's oil imports fell from 15.1 per cent to 3.7 per cent in the second quarter of 2022.
- **Renewable generation rose** 12 per cent on the same period last year due to more favourable conditions and increased capacity. Renewable's share of generation rose to 38.6 per cent, with low carbon's share increasing 2.1 percentage points to 55.0 per cent with stronger output from nuclear. Fossil fuel's share of generation fell by 2.1 percentage points to 41.9 per cent.
- **Renewable generation capacity grew by 6.5 per** cent on the same quarter last year, with offshore wind growing 23 per cent. The growth in renewable capacity has increased in recent quarters after a relatively sustained period of more modest growth. On a longer timeframe, renewable generation capacity is now six times greater than the same quarter of 2010.

Section 1: UK total energy

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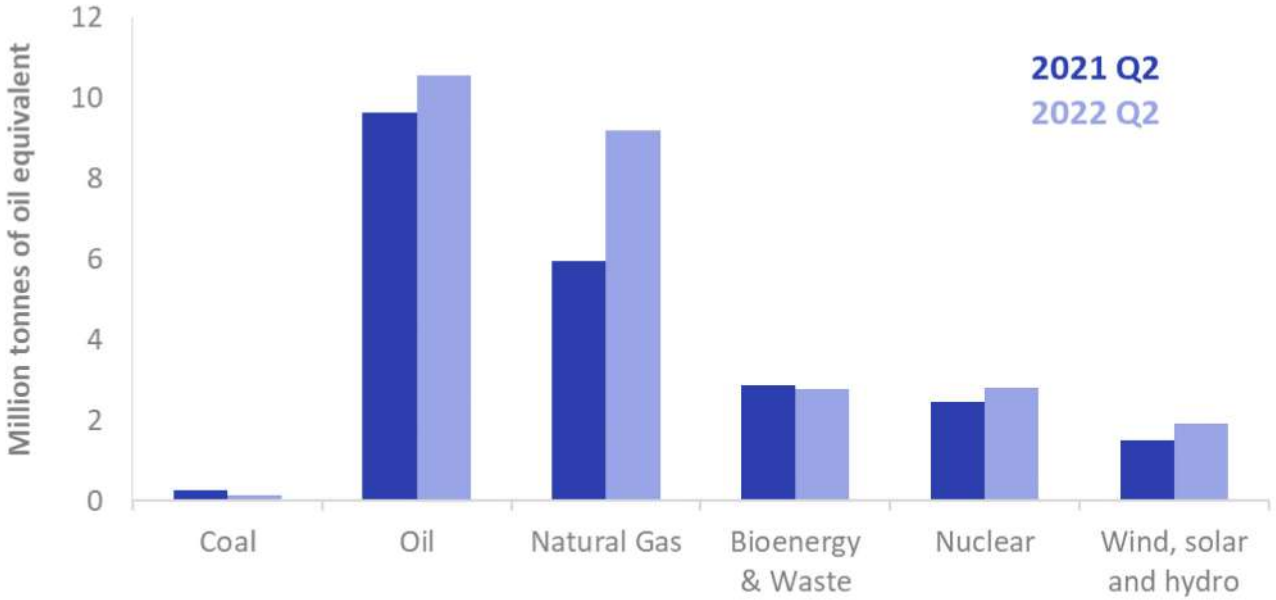
Key headlines

In the second quarter of 2022 **total production was 27.4 million tonnes of oil equivalent, 21 per cent higher** than in the second quarter of 2021. The main reason for the increase is the impact of significant maintenance on the North Sea (notably the shutdown of the Forties Pipeline System) in Summer 2021, which severely reduced oil and gas output.

Total primary energy consumption for energy uses fell by 0.3 per cent, with petroleum consumption increasing as lockdown restrictions eased on last year but warmer weather reducing gas consumption. When adjusted to take account of weather differences, primary energy consumption rose by 4.4 per cent.

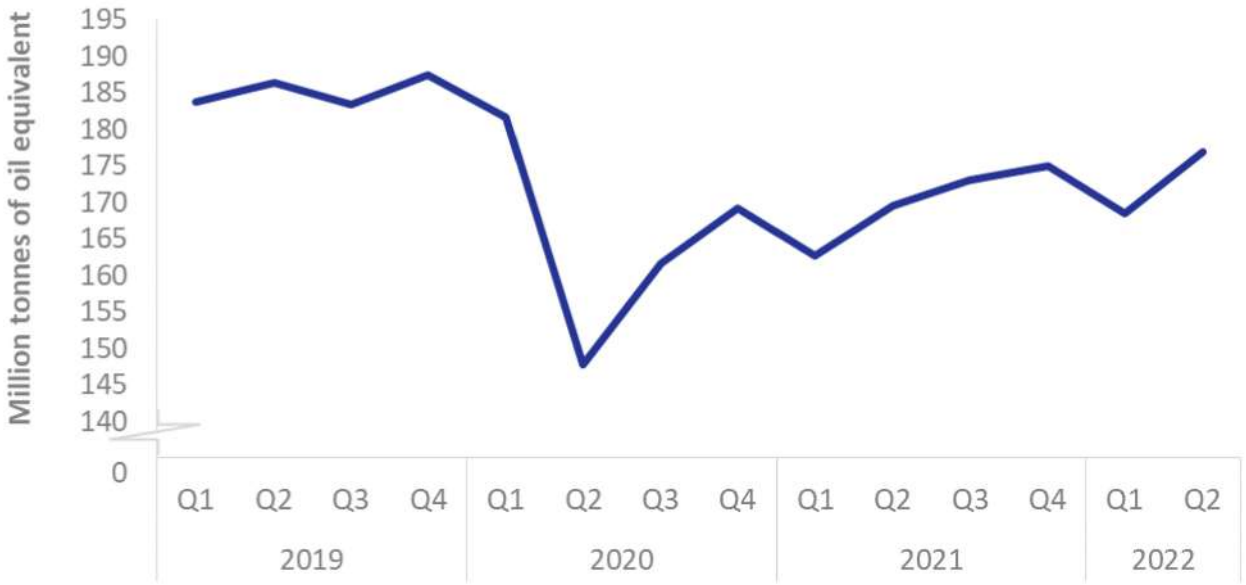
Total final energy consumption (excluding non-energy use) was 0.2 per cent lower compared to the second quarter of 2021. Transport consumption rose by 23 per cent as international travel restrictions were eased; domestic consumption fell by 28 per cent with average temperatures warmer than a year earlier, other final users (mainly from the service sector) consumption fell by 3.0 per cent and industrial consumption fell by 0.2 per cent. On a seasonally and temperature adjusted basis, final energy consumption rose by 4.9 per cent, with rises in all sectors except domestic which fell by 7.5 per cent. With the exception of transport consumption which remains relatively low, the energy requirements of most sectors are broadly in line with pre-pandemic levels.

Chart 1.1 UK production (Energy Trends table 1.1)



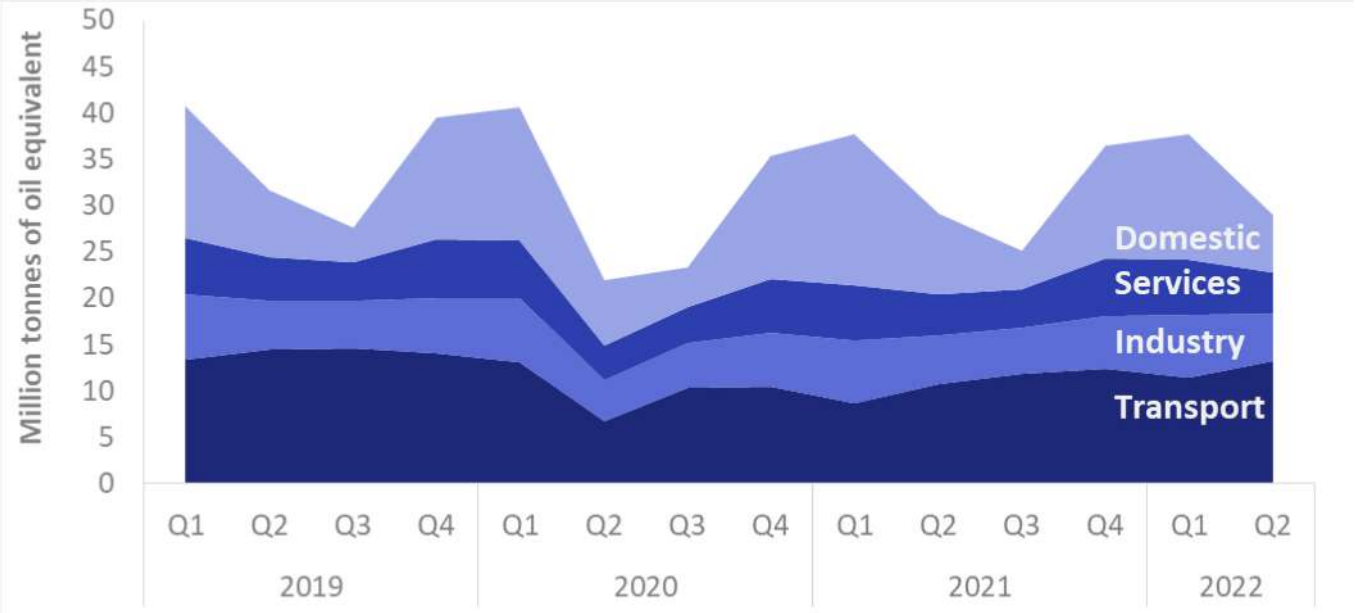
In the second quarter of 2022 **total production was 27.4 million tonnes of oil equivalent, 21 per cent higher** than in the second quarter of 2021, when output was at the lowest quarterly level recorded in the 21st century. The main reason for the increase was the impact of maintenance in Summer 2021 on the UK Continental Shelf which saw the shutdown of the Forties Pipeline System (FPS) as well as reduced capacity at several major gas terminals. In the second quarter of 2022 oil and gas production rose by 27 per cent compared to a year earlier, with gas output, which rose by 55 per cent, now broadly similar to pre-pandemic levels. Nuclear output rose despite the closure of Hunterston B power station in Scotland, whilst wind, solar and hydro output rose due to more favourable weather conditions and increased capacity for wind and solar generation.

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



In the second quarter of 2022 **total inland consumption (which includes not only fuel use by consumers, but fuel used for electricity generation and other transformation)** was 176.9 million tonnes of oil equivalent, 4.4 per cent higher than in the second quarter of 2021, on a seasonally adjusted and annualised rate that removes the impact of temperature on demand - and 5.0 per cent higher than in the first quarter of 2022. These increases represent the impact of no lockdown restrictions in 2022 compared with 2021 when many activities were curtailed as a result of the Covid-19 pandemic.

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



In the second quarter of 2022 **total final energy consumption (excluding non-energy use) was 0.2 per cent lower** than in the second quarter of 2021, as warmer temperatures compensated for increased activity in the economy. Transport consumption rose by 23 per cent with petrol and diesel consumption returning to near pre-pandemic level. Jet fuel consumption also increased but lies substantially below pre-pandemic levels. More broadly in the economy, service sector consumption fell by 3.0 per cent, and industrial sector energy consumption fell by 0.2 per cent. Domestic consumption fell by 28 per cent, as a result of the warmer weather and a decrease in the amount of time working at home.

Section 2: Coal and derived gases

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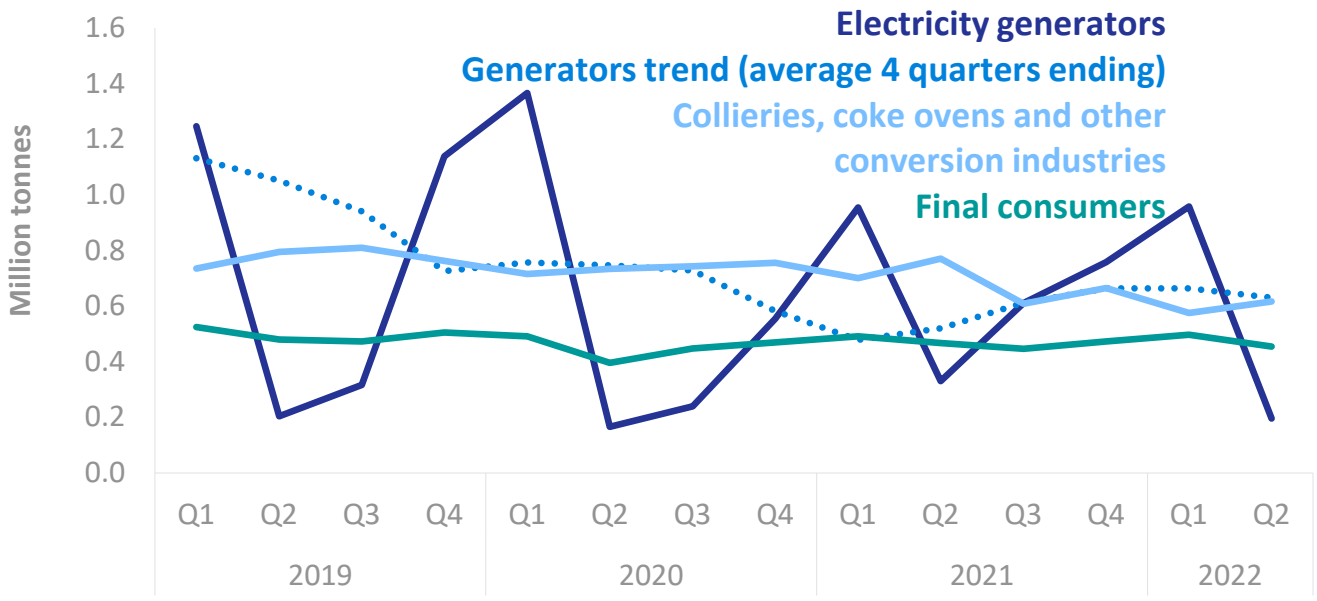
Key headlines

In the second quarter of 2022, demand for coal by electricity generators fell to 195 thousand tonnes. Much of this decrease was due to coal supply for Major Power Producers (MPP) **falling to a new record low of 17 thousand tonnes in May 2022**, with National Grid reporting 635 consecutive coal free hours. Drax coal units were mothballed at the end of March 2021 but will be available for generation if needed over the coming winter. Coal use for electricity generation is expected to cease completely by October 2024. (Chart 2.1)

Overall coal production **for the second quarter of 2022 fell to 190 thousand tonnes,** down 48 per cent on the second quarter of 2021. Surface mining production fell to 179 thousand tonnes. Mine closures and a pattern of generally falling demand contributed to lower production.

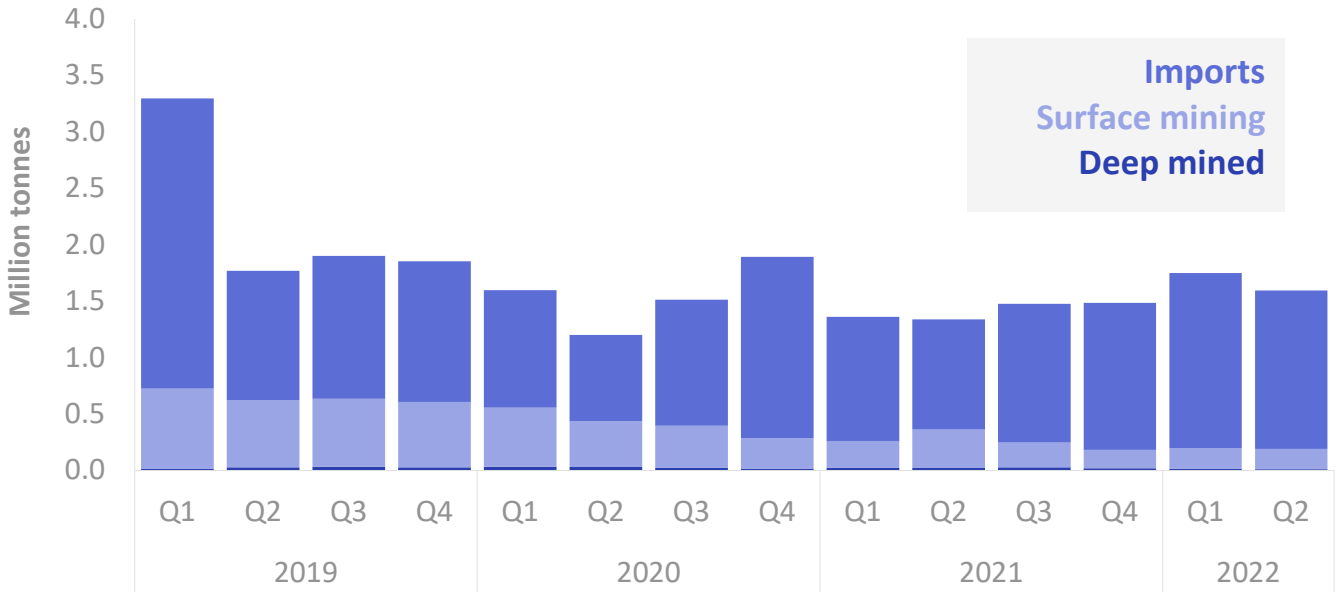
In the second quarter of 2022, **coal imports rose to 1.4 million tonnes**, 44 per cent up on the same period last year. The USA was the largest supplier of coal into the UK at 54 per cent of total imports. Russia provided 19 per cent of coal imports, down from 48 per cent in the same period last year mirroring the decreasing reliance on Russian energy seen in oil and gas.

Chart 2.1 Coal Consumption (Energy Trends table 2.1)



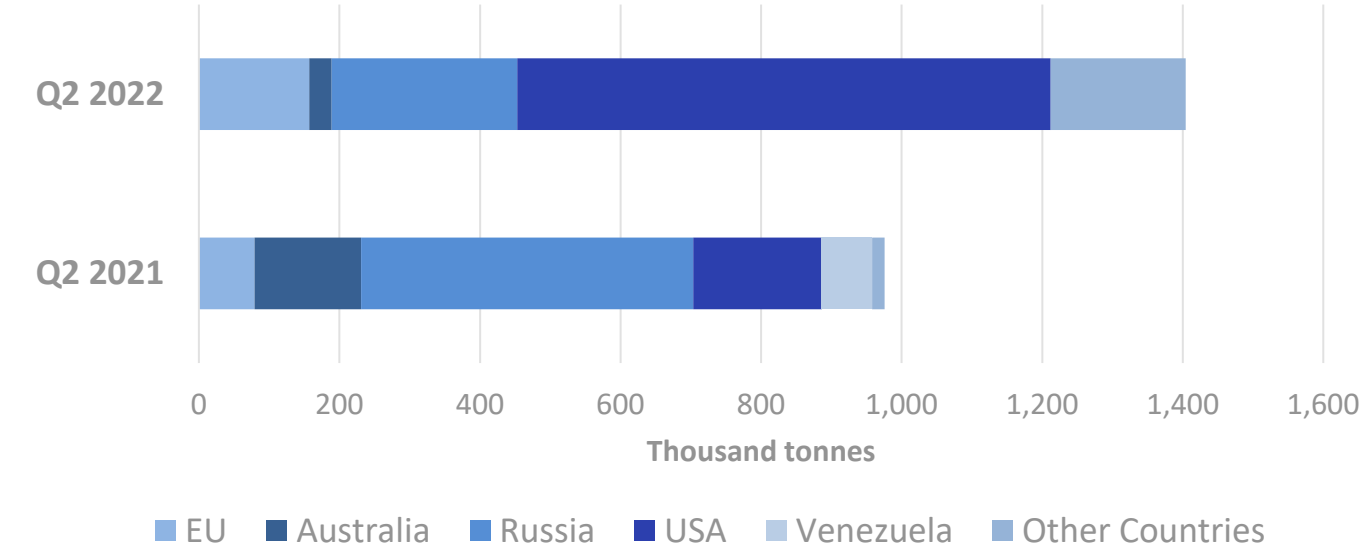
In the most recent quarter, coal demand for coal-fired electricity generation fell 41 per cent to 195 thousand tonnes. This was close to the lowest value on record in Quarter 2 2020 (166 thousand tonnes). Much of this decrease was due to supply for Major Power Producers (MPP) falling to a new record low of 17 thousand tonnes in May 2022, with National Grid reporting 635 consecutive coal free hours with generation from gas, nuclear and renewables increasing. Demand for coal-fired generation is seasonal, peaking in winter when conditions are cold and dark; these peaks have declined as coal-fired generation became less competitive economically and gas and renewable sources displaced it.

Chart 2.2 Coal Supply (Energy Trends table 2.1)



Domestic coal production has fallen steadily because of coal mine closures and a pattern of generally reduced demand over time, particularly for generation. Imports filled the gap, rising from 1.0 million tonnes in the second quarter of 2021 to 1.4 million tonnes in the second quarter of 2022. However, imports have fallen from the peak of 13.3 million tonnes in the second quarter of 2013 as overall demand dropped.

Chart 2.3 Coal Imports (Energy Trends table 2.4)



In the second quarter of 2022, **coal imports rose to 1.4 million tonnes**, 44 per cent up on the same period last year as electricity generators rebuilt stocks depleted during the first quarter. The USA was the largest supplier of coal into the UK at 54 per cent of total imports. Russia provided 19 per cent of coal imports, down from 48 per cent in the same period last year with coking coal imports reducing to 0. This decrease mirrors the reduced reliance on Russian energy seen in oil and gas.

Section 3: Oil and oil products

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Key headlines

In Quarter 2 2022, production of primary oils rose by 9.3 per cent, recovering from a low in the previous year. In Quarter 2 2021, production reached the second lowest level recorded due to extensive scheduled maintenance on key North Sea infrastructure. However, despite the recent increase, production remains below pre-pandemic levels.

Net imports of primary oils rose to meet demand amid low production. The two largest import sources were Norway and the USA. The proportion of oil (both primary oils and products) from Russia decreased, dropping from 15.1 per cent in the second quarter of 2021 to 3.7 per cent this year.

Demand for petroleum products increased by 15 per cent, driven by a tripling in jet fuel demand. Demand for transport fuels rose following the removal of pandemic restrictions in comparison with Quarter 2 2022. However, demand is yet to recover to pre-pandemic levels.

Oil stocks fell by 8.1 per cent due to high stockholding during the pandemic and the UK's recent contribution to the International Energy Agency (IEA) coordinated stock release. At the end of Quarter 2 2022, the UK held over 200 days of net imports as stocks, well above the IEA requirement of 90 days.

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

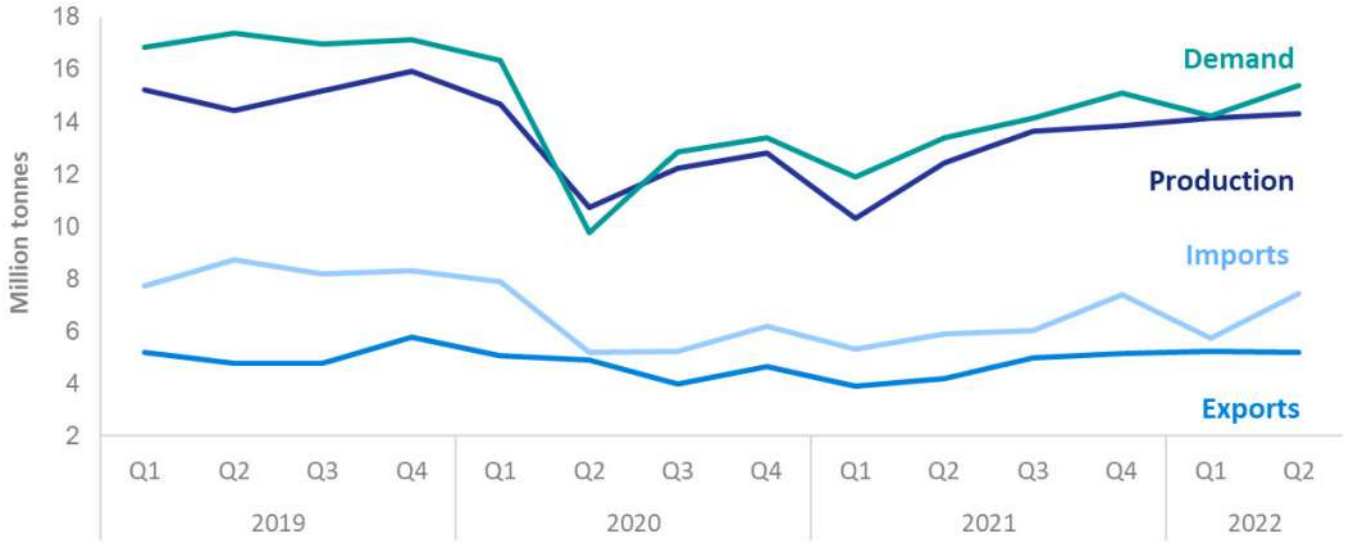
Production of primary oils increased, up 9.3 per cent compared with the previous year's record low. Production fell to the second lowest recorded level in Quarter 2 2021 as an extensive summer maintenance schedule on North Sea infrastructure began. This included shutdown of the Forties Pipeline System, which serves a significant portion of UKCS infrastructure. Whilst production has since recovered, it remains muted and below that seen before the Covid-19 pandemic.

Refinery demand rose by 13 per cent compared with the same period in the previous year. This follows several quarters of increasing demand following the extreme lows seen during the Covid-19 pandemic.

Net imports increased by 16 per cent compared with Quarter 2 2021. As indigenous production remained low, increasing demand was met through imports. The majority of imports were sourced from Norway and the USA, accounting for 32 and 31 per cent of UK primary oil imports respectively. Imports from Russia fell

significantly and have dropped month on month. The share of Russian imports decreased to 3.7 per cent this quarter, down from 15.1 per cent last year.

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



Demand for petroleum products rose by 15 per cent in Quarter 2 2022, reflecting the removal of pandemic-related restrictions since Quarter 2 2021. Increased demand was met through a rise in production and imports, both reaching their highest levels since the beginning of 2020. Increased production meant that UK exports rose by almost a quarter. This was particularly seen where production exceeded domestic demand, for example, petrol exports increased by 40 per cent.

Consumption by the transport sector increased by over a fifth, raising overall demand. The rise in overall demand was despite a corresponding fall in domestic consumption, also down by a fifth, due to lower average temperatures reducing demand for burning oil. Consumption by other final users (e.g., commercial use) remained relatively stable.

Increases in demand for petrol and diesel were at 6.1 and 4.8 per cent respectively and are now close to pre-pandemic levels. **Demand for jet fuel more than tripled, recovering from pandemic-related lows in 2021.** Of the key transport fuels, aviation fuel was the most heavily affected by pandemic restrictions with demand reaching a historic low of just 0.5 million tonnes in Quarter 2 2020. Demand has since recovered, met through substantial increases in production and imports, but remains almost a fifth below that recorded in the same period in 2019.

Chart 3.3 Stocks of oil held for the UK (Energy Trends table 3.6)

The UK held 9.4 million tonnes of stock at the end of Quarter 2 2022, 8.1 per cent lower than the previous year. This reflected elevated stock levels in early 2021 due to reduced demand, and the more recent coordinated stock release by the International Energy Agency (IEA) in response to Russia's invasion of Ukraine. **UK stocks were equivalent to over 200 days of net imports**, well above the IEA requirement.

The UK holds stock both domestically and abroad. **Stock held in the UK stock fell by 11 per cent** in Quarter 2 2022, including a 36 per cent reduction in kerosene due to a significant increase in demand for international aviation. However, kerosene stock remained stable on values seen in the previous quarter.

UK stocks held abroad remained low, rising to 0.5 million tonnes from 0.2 million tonnes last year. In 2021, the UK's stockholding obligation changed from both the EU and IEA requirement, to just the IEA requirement. This resulted in an overall reduction in stocks, with significant falls in international stocks as companies used domestic stocks to meet the lower requirement.

Section 4: Gas

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Key headlines

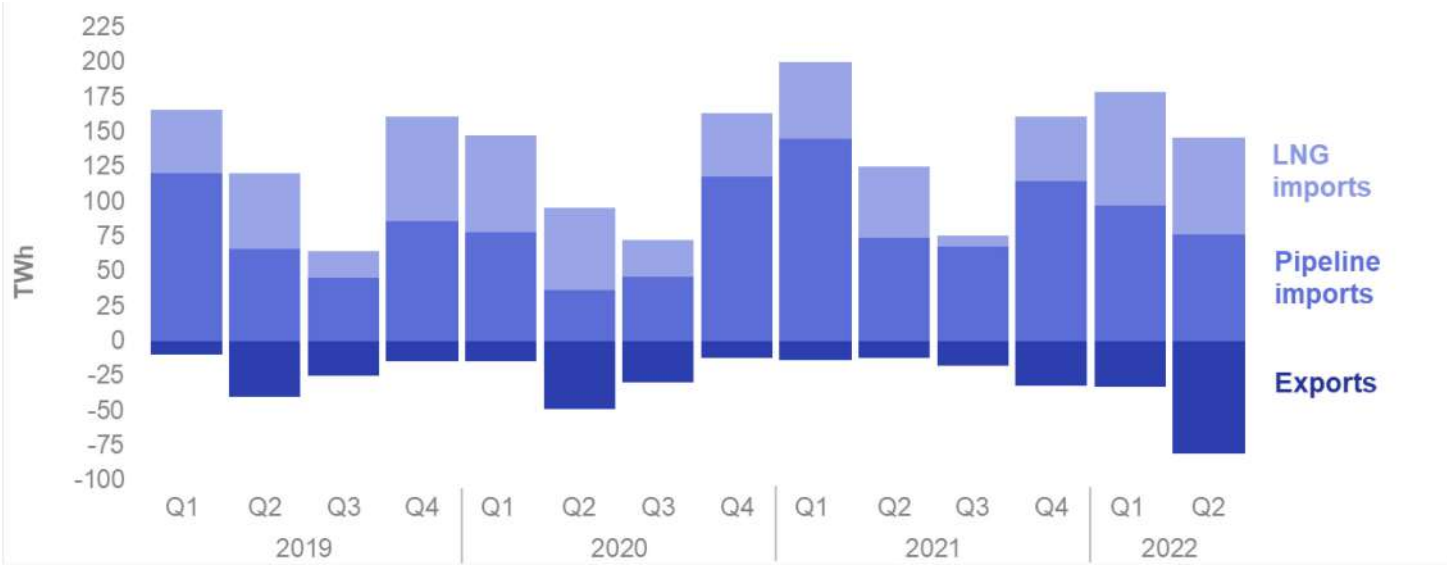
In Quarter 2 2022, exports reached a record high as the UK supported European efforts to move away from Russian gas. Reduced domestic demand meant that the UK acted as a land-bridge for increased global exports to European markets, utilising interconnectors between the UK, Belgium and the Netherlands.

Liquefied Natural Gas (LNG) imports increased by 37 per cent as the UK's substantial regasification infrastructure was used to increase supply to European markets. This included a sharp rise in imports from the USA, which more than doubled compared to Quarter 2 2021.

Production increased by 55 per cent, compared to a historic low in the same period the previous year. In 2021, production was muted due to extensive scheduled maintenance on key North Sea infrastructure.

Demand for natural gas fell by 9.7 per cent in comparison with Quarter 2 2021. This was driven by a large fall in domestic consumption, down by a third, following warmer average temperatures. Conversely, gas used for electricity generation increased by 2.0 per cent due to a rise in electricity demand.

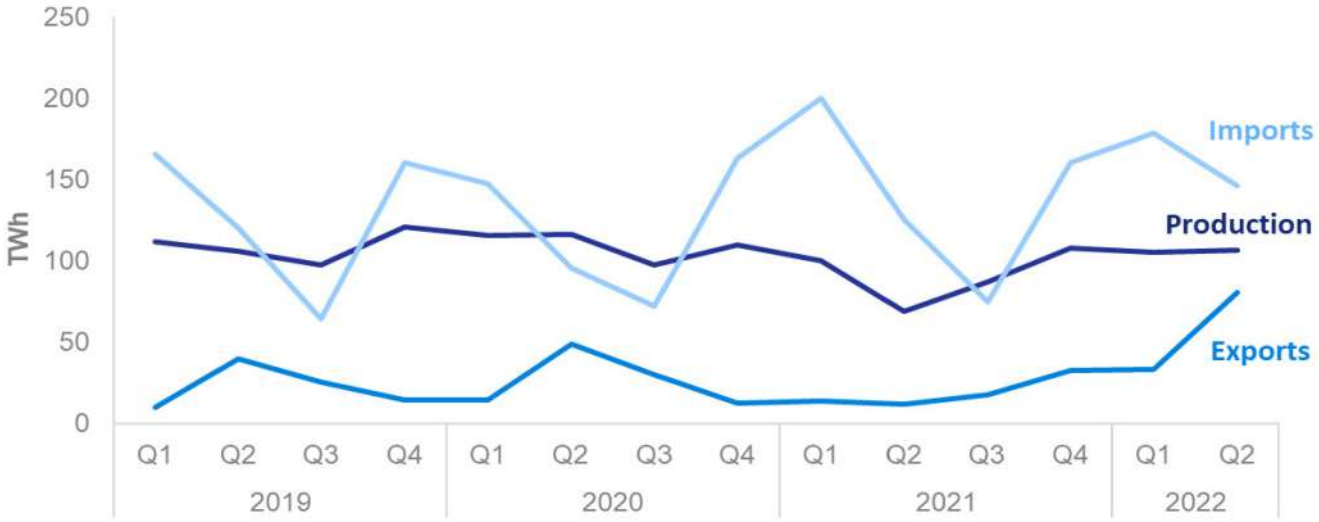
Chart 4.1 Trade in natural gas (Energy Trends table 4.3)



In Quarter 2 2022, gas exports reached a record high of 81 TWh, higher than total exports for the year in 2021. The UK supported European efforts to move away from Russian gas, utilising substantial LNG regasification infrastructure and interconnectors with mainland Europe. Exports were almost seven times that seen in Quarter 2 2021 and 27 per cent higher than the previous record from Quarter 2 2003. Exports to Belgium and the Netherlands over the last three months alone are substantially higher than many annual totals from previous years.

Imports increased by 17 per cent, the result of increased imports of LNG. Pipeline imports were sourced entirely from Norway as the Belgian and Dutch interconnectors were solely used for exports throughout the quarter. **LNG imports increased by 37 per cent** as the UK operated as a land-bridge for European markets. Qatar remained the largest source of LNG to the UK, accounting for 44 per cent of total LNG imports. This was closely followed by imports from the USA, where imports increased substantially to reach a share of 36 per cent of LNG imports. The UK did not receive any imports of LNG from Russia in Quarter 2 2022, with the last cargo arriving in March 2022.

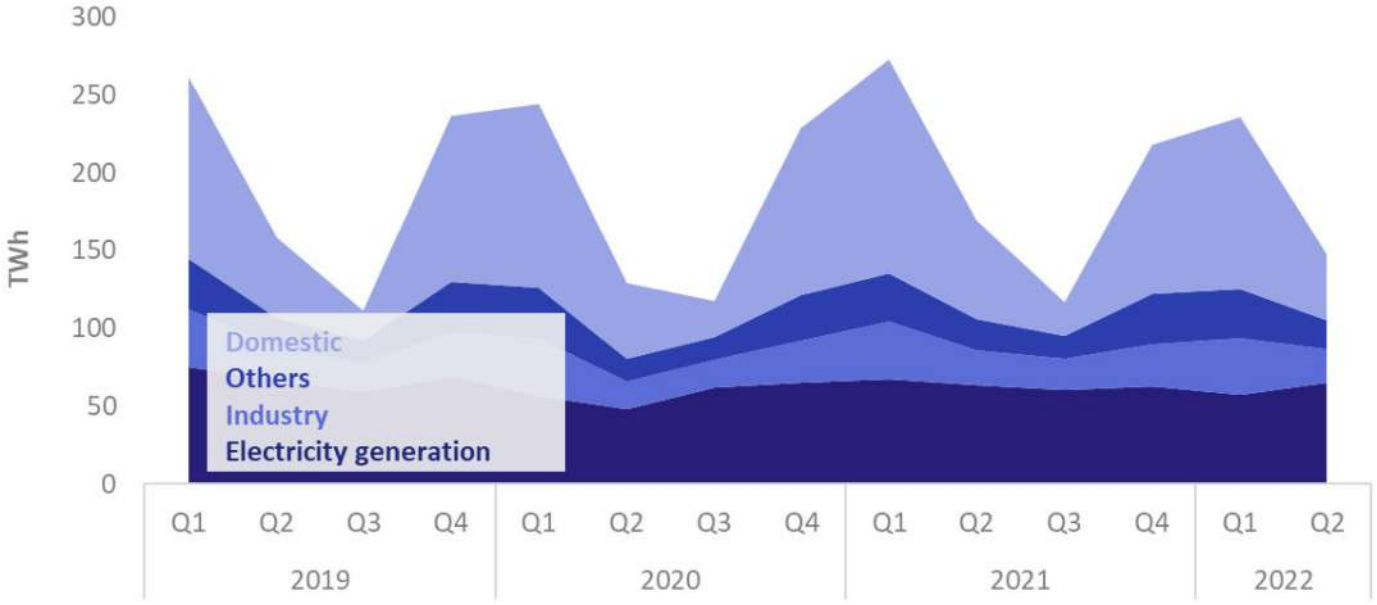
Chart 4.2 Production and trade of natural gas (Energy Trends table 4.2)



Gross gas production increased by 55 per cent in Quarter 2 2022, compared to the previous year's record low. Production in 2021 fell as the North Sea infrastructure underwent extensive maintenance. This included the shutdown of the Forties Pipeline System, critical for a large proportion of UK oil and gas production.

Net imports fell by over two fifths as exports reached a record high. Relatively low UK demand coupled with an increase in imports of LNG meant that the UK was able to support European efforts to move away from Russian gas.

Chart 4.3 Demand for natural gas (Energy Trends table 4.1)



Demand for natural gas was 169 TWh in Quarter 2 2022, down 9.7 per cent when compared with Quarter 2 2021. This was largely the result of a fall in domestic gas demand due to warmer temperatures.

Domestic demand dropped by 34 per cent as warmer temperatures reduced heating demand in comparison with the same period in the previous year. Consumption by other final users (e.g. commercial use) also fell, though the effect of warmer temperatures was offset by increased demand following the removal of restrictions relating to the Covid-19 pandemic. Industrial demand remained stable on the previous year.

Gas used for electricity generation increased by 2.0 per cent, due to increased demand for electricity in Quarter 2 2022 in comparison with the same period in the previous year.

Section 5: Electricity

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Key headlines

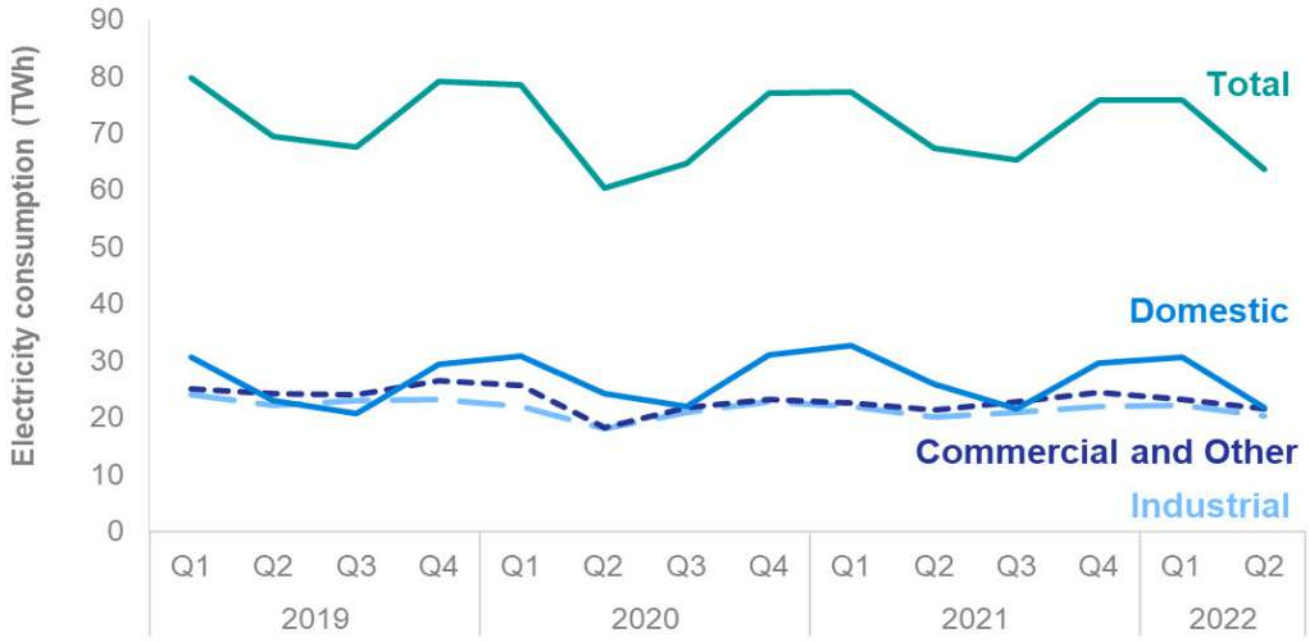
Quarter 2 of 2022 saw total electricity generation increase by 8.2 per cent compared to the same period in 2021, in contrast to a 5.5 per cent decrease in total demand. This came as a result of the UK becoming a net exporter of electricity in Quarter 2, with net exports of 4.0 TWh.

Domestic consumption decreased substantially in Quarter 2 2022, down 15.8 per cent, while both non-domestic sectors saw slightly increased consumption levels. This reflects warmer average temperatures in April and May reducing heating demand, partially offsetting increased demand from the lifting of Covid-19 restrictions.

Renewable electricity generation increased 12 per cent to 30.5 TWh as generation from wind increased substantially. Fossil fuels generation increased by 3.1 per cent to 33.2 TWh.

Low carbon sources generated 55.0 per cent of the total in Quarter 2 2022, 2.1 percentage points higher than the previous year. This included a 14 per cent increase in nuclear generation, despite lower operational nuclear capacity following the closure of Hunterston B in January 2022.

Chart 5.1 Electricity consumption by sector (Energy Trends table 5.2)



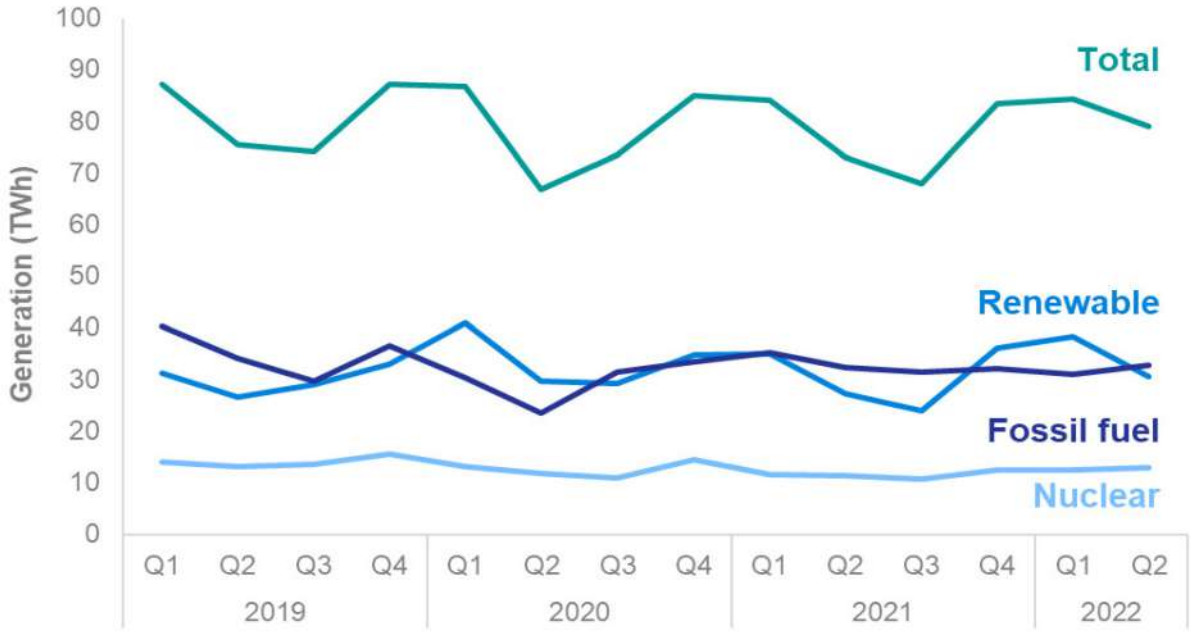
Total consumption of electricity was 63.6 TWh in Quarter 2 2021, the lowest quarterly value since Quarter 2 2020 when the first Covid-19 lockdown substantially reduced demand. This was a 5.6 per cent decrease compared to Quarter 2 of 2021 and came as warmer average temperatures in April and May reduced heating demand, partially offsetting increased demand from the lifting of Covid-19 restrictions. It may also reflect reductions in consumption because of higher electricity prices.

Domestic consumption decreased substantially in Quarter 2 2022, down 15.8 per cent to 21.7 TWh, the lowest value since Quarter 3 2019. This reflects the Covid-19 restrictions in place during the same months in

2021 which meant that people spent more time at home than usual. Quarter 2 2022 also saw warmer average temperatures in April and May which reduced electricity demand for heating.

Both non-domestic sectors saw slightly increased consumption levels in Quarter 2 2022 compared to the same period in 2021. Lifting of Covid-19 restrictions meant that businesses and industry could operate as normal during the period, though the increased demand was partially offset by warmer average temperatures. Electricity consumed by the industrial sector increased by 0.8 per cent compared to Quarter 2 2021. This broadly mirrors the trends shown in the manufacturing Index of Production. Similarly, consumption by other final users (including the commercial sector) increased by 0.6 per cent in Quarter 2 2022 compared to the same period in 2021.

Chart 5.2 Electricity generated, by fuel type (Energy Trends table 5.1)



Quarter 2 of 2022 saw total electricity generation of 79.0 TWh, which was an 8.2 per cent increase compared to Quarter 2 2021. This was in contrast with the 5.5 per cent decrease in total demand over the same period, which came as a result of the UK becoming a net exporter of electricity in Quarter 2, with net exports of 4.0 TWh.

Renewable electricity generation was 30.5 TWh in Quarter 2 2022, 12 per cent higher than the same period in 2021. Despite this, renewable generation was slightly below the generation from fossil fuels. The increase in renewables was primarily led by increased wind generation, which rose by 42 per cent to 16.3 TWh. This increase in wind generation came due to higher average wind speeds compared to a year ago as well as increased wind capacity.

Fossil fuels generated 33.2 TWh in Quarter 2 2022, higher than the generation from renewable sources. This was a 3.1 per cent increase and came as fossil fuels were needed to meet the total demand for electricity, including the demand for exports. Gas remained the fuel with the highest generation at 32.3 TWh, 4.0 per cent higher than in Quarter 2 2021. Coal generation remained low at 0.5 TWh, 37 per cent lower than the same period in the previous year.

Low carbon sources generated 55.0 per cent of the total in Quarter 2 2022, 2.1 percentage points higher than the previous year. This included an increase of 14 per cent in nuclear generation to 13.0 TWh. This increase came despite lower operational nuclear capacity following the closure of Hunterston B nuclear plant in January 2022.

Section 6: Renewables

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Key headlines

In Quarter 2 2022, renewable electricity generation was 30.5 TWh, 12 per cent up on the same quarter last year, and a record for Quarter 2. A strong increase in wind generation (up by 42 per cent) more than offset lower generation from bioenergy (down by 16 per cent as a result of outages).

Renewable capacity is 3.2 GW (6.5 per cent) higher than 2021 Q2, 0.5 GW of which was added during the current quarter. The bulk of the new capacity is in offshore wind (2.4 GW), though onshore wind saw 0.4 GW installed and 0.3 GW in solar PV.

Renewables share of electricity generation was 38.6 per cent in Quarter 2 2022, higher than the same quarter last year (37.3 per cent) but lower than fossil fuels' share (41.9 per cent).

Chart 6.1 Change in renewable generation and capacity between Q2 2021 and Q2 2022 (Energy Trends table 6.1)

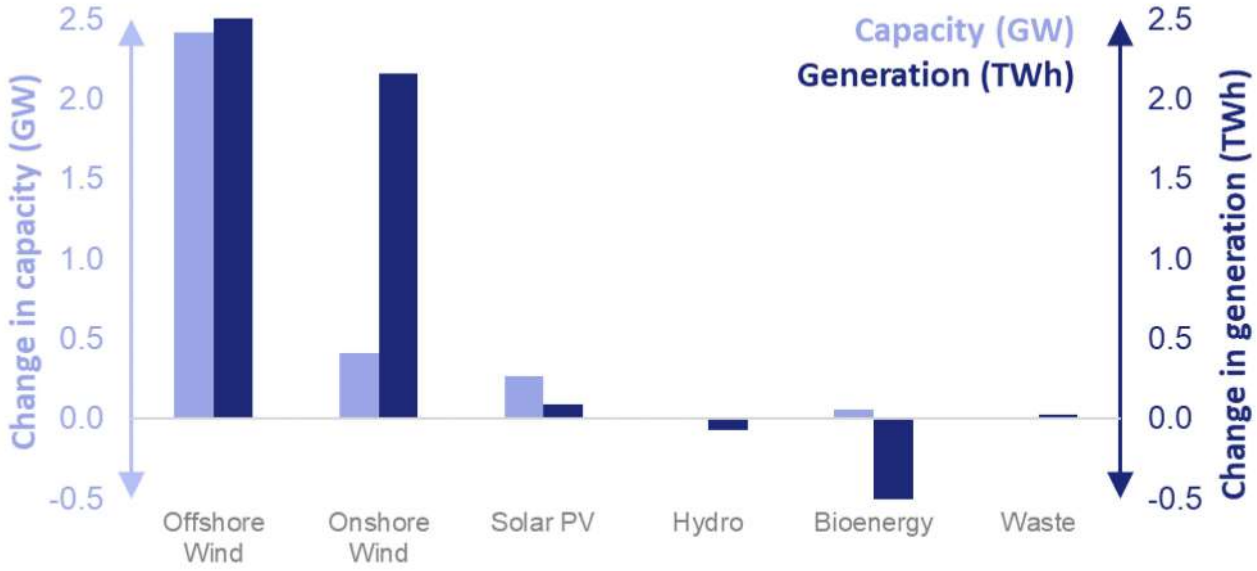
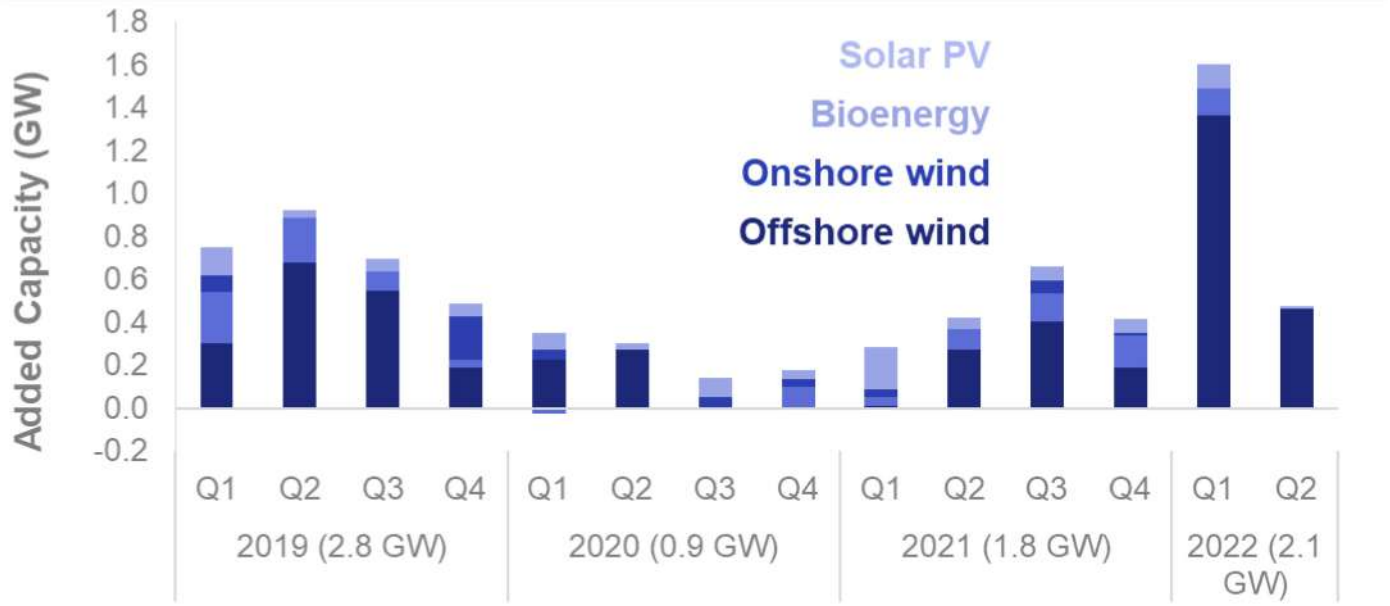


Chart 6.1 compares changes in capacity and generation by technology for Quarter 2 in 2021 and 2022. Where capacity and generation trends conflict, it tends to indicate the dominance of weather effects. Although there were no all-time records set during the second quarter of 2022, generation was a record when comparing just the second quarters from previous years (weather conditions across the board tend to be less favourable for renewable generation in the second quarter). Wind speeds were in line with historic averages for the quarter, though higher than 2021 resulting in relatively higher wind generation. There was also new capacity added at Hornsey 2 offshore wind farm and at East Moray. A modest increase in Solar PV capacity (0.3 GW, or 1.9 per cent) boosted generation by 1.7 per cent; sun hours were the same for Quarter 2 in 2022, compared to 2021. Bioenergy generation fell by 16 per cent, due to planned maintenance during May and June at a major power plant.

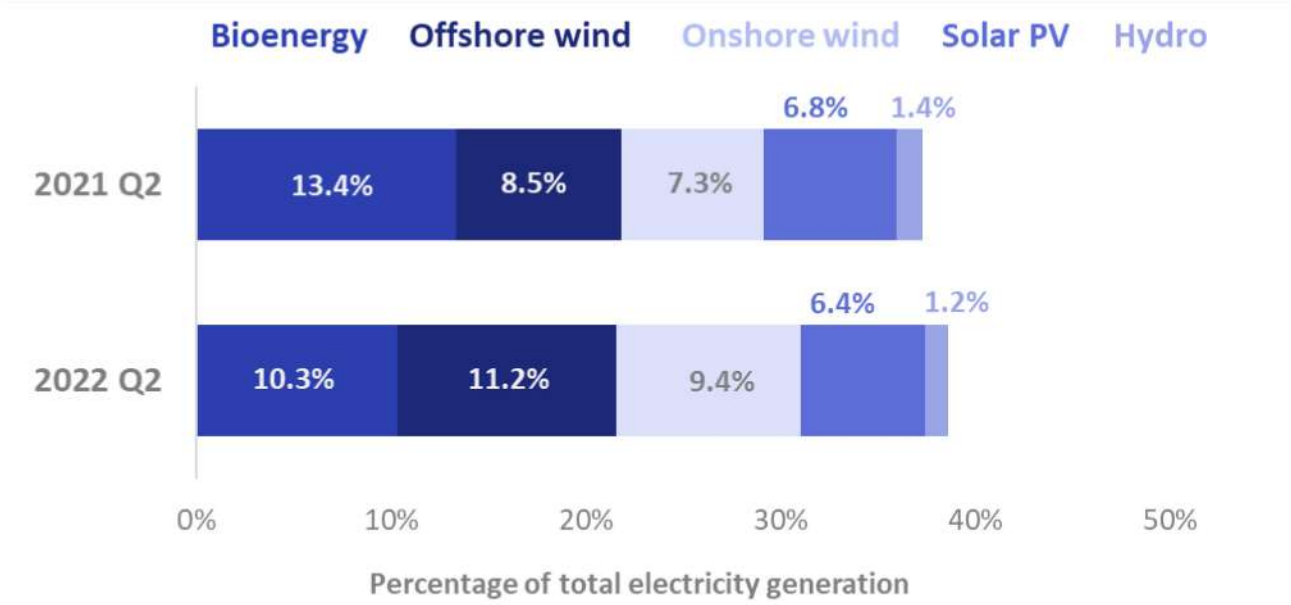
Total renewable capacity grew by 3.2 GW (6.5 per cent) between the end of Quarter 2 2021 and Quarter 2 2022. New capacity added in 2022, with just two quarters to date, already outstrips new capacity added during the whole of 2020 (0.9 GW) and 2021 (1.8 GW).

Chart 6.2 Added capacity since 2019 for the leading technologies (Energy Trends table 6.1)



Around three quarters of the new capacity is in offshore wind; East Moray added 0.9 GW in Quarter 1 2022 and Hornsey Two added 0.9 during the first two quarters of 2022. Onshore wind saw an additional 0.4 GW of capacity and solar PV 0.3 GW.

Chart 6.3 Renewables' share of electricity generation – Q2 2021 and Q2 2022 (Energy Trends table 6.1)



In Quarter 2 2022, renewables' share of generation was 38.6 per cent, 1.3 percentage points higher than Quarter 2 2021 but lower than the generation share of fossil fuels (41.9 per cent). This is largely due to an increase in wind generation, with onshore's share increasing from 7.3 per cent to 9.4 per cent, and offshore from 8.5 per cent to 11.3 per cent. This increase more than offset the fall in bioenergy's share with reduced generation at a major plant due to planned maintenance.

Data tables and special articles

Data in this release

Data are collected by BEIS 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:

Regional renewable electricity in 2021

Competition in UK electricity markets

Competition in UK gas supply 2021

Diversity of supply for oil and oil products in OECD countries in 2021

Combined Heat and Power in the regions

Proposed changes to Energy Trends tables 3.6 and 3.11

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 published on 28 July 2022:
http://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 BEIS using Met Office data:
https://www.gov.uk/government/collections/weather-statistics

Information on Energy Prices:
http://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 published by BEIS, please contact Kevin Harris:

Tel: 0747 135 8194

e-mail: kevin.harris@beis.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	.39683	**toe**	1	41.868	11.63	396.83
TJ	.023885	1	.27778	.0094778	**GJ**	.023855	1	277.78	9.4778
GWh	.085985	3.6	1	.034121	**kWh**	.000085985	.003600	1	.034121
million therms	2.52	105.51	29.307	1	**therms**	.00252	.105510	29.307	1

toe = tonne of oil equivalent
ktoe = thousand 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
Other final users	
Agriculture	01-03
Commercial	45-47, 52-53, 55-56, 58-66, 68-75, 77-82
Public administration	84-88
Other services	90-99
Domestic	Not covered

Revisions policy

Figures for the latest periods are provisional and are liable to subsequent revision. The BEIS 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.

Related publications

Recent publications of interest

Smart Meters
Statistics on the roll-out of Smart Meters in Great Britain, covering meters operating and meters installed: www.gov.uk/government/collections/smart-meters-statistics

Household Energy Efficiency
Statistics on the Energy Company Obligation (ECO), Green Deal and homes insulated. Monthly updates of ECO measures and quarterly updates of in-depth ECO statistics, carbon savings and the Green Deal schemes: www.gov.uk/government/collections/household-energy-efficiency-national-statistics

Renewable Heat Incentive
Statistics on deployment data for the domestic and non-domestic Renewable Heat Incentive (RHI) to support the uptake of renewable heat: www.gov.uk/government/collections/renewable-heat-incentive-statistics

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 BEIS'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 BEIS'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 BEIS 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

National statistics

This is a National Statistics publication. National Statistics status means that our statistics meet the highest standards of trustworthiness, quality, and public value, and it is our responsibility to maintain compliance with these standards.

The Office for Statistics Regulation confirmed continued designation of Energy Trends as National Statistics in 2018 following a compliance check. A full assessment against the Code of Practice was last conducted in June 2014.

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 BEIS 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

If you need a version of this document in a more accessible format, please email energy.stats@beis.gov.uk

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

Regional renewable electricity in 2021

William Spry **07825 194608** william.spry@beis.gov.uk

Key headlines

Renewable generation in the UK fell by 9.3 per cent from 134.7 TWh in 2020 to 122.2 TWh in 2021. This was a result of reduced rainfall, wind and sunshine hours. Within this:

- Generation in England was **down 7.2 per cent**
- Generation in Northern Ireland was **down 11.1 per cent**
- Generation in Scotland was **down 14 per cent**
- Generation in Wales was **down 14.1 per cent**

Overall capacity increased by 3.7 per cent from 47.9 GW at the end of 2020 to 49.7 GW at the end of 2021. Within this:

- Capacity in England was **up 3.7 per cent**
- Capacity in Northern Ireland was **up 4.4 per cent**
- Capacity in Scotland was **up 3.6 per cent**
- Capacity in Wales was **up 2.8 per cent**

Background

This article provides information and analysis on the amount of electricity from renewable sources, disaggregated below the UK level. It includes information on capacity, generation, and number of operational sites, as well as derived load factors, for the four UK countries, the nine English regions and, from 2014, UK Local Authorities. It updates the previously published figures in the September 2021 edition of *Energy Trends*.

These data are consistent with those published for the UK in Table 6.4 of the Digest of United Kingdom Energy Statistics 2022 (DUKES)[1], and use similar categories[2]. The UK totals published here are consistent with the figures published in Energy Trends. However, there are small differences between the totals published for England, Northern Ireland, Scotland and Wales published here and those published in ET 6.1. Some sites cannot be allocated to local authorities where it would disclose the generation of individual schemes.

Time-series data for each year from 2003 for regional and Local Authority data from 2014, are available as Excel spreadsheets at www.gov.uk/government/statistics/regional-renewable-statistics. The spreadsheets include detailed data and additional charts for generation, capacity, number of sites, generation per GVA, and load factors by countries of the UK, regions of England, and by local authority.

Capacity

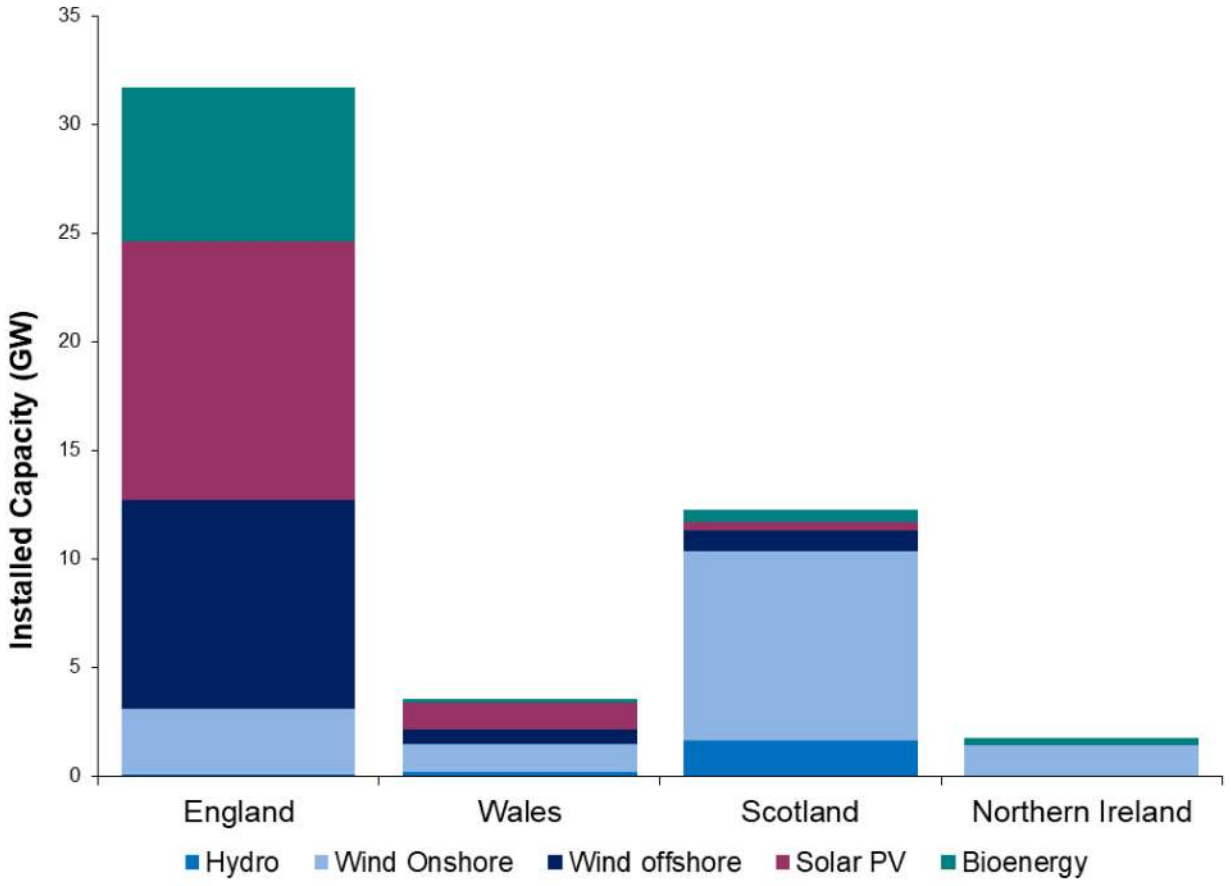
- England had the most renewable capacity and generation, more than two and a half times that for Scotland. This is largely because England has 88 per cent of the UK's bioenergy capacity (mostly from four biomass units at Drax and the Ferrybridge Multifuel Power

[1] www.gov.uk/government/statistics/renewable-sources-of-energy-chapter-6-digest-of-united-kingdom-energy-statistics-dukes

[2] On occasion, it has been necessary to combine some renewable sources into categories so that information about individual sites provided in confidence (rather than from publicly available sources) to Ricardo Energy & Environment and (BEIS) is not disclosed.

Station in Yorkshire and the Humber), 85 per cent of the PV capacity, and 85 per cent of the offshore wind capacity. Chart 1 shows a breakdown of capacity at the end of 2021 by technology and country.

Chart 1: Renewable capacity at the end of 2021 by technology and country



- The technology with the highest growth in capacity was **offshore wind** (8.4 per cent) which accounted for 49 per cent of the total UK growth. The new capacity was located mainly in the East Midlands (95 per cent). This was largely driven by Triton Knoll, with the addition of 825 MW capacity.

- **Onshore wind**[3] grew by 3.0 per cent in the UK, accounting for 23.4 per cent of the total UK growth. 80 per cent of the new capacity was in Scotland (largest scheme: Aikengall 3 Community Wind Farm – 76 MW), 18 per cent in Northern Ireland (largest scheme: Evishagaran – 47 MW), and 2 per cent in Wales.

- **Solar PV** capacity grew by 2.8 per cent, 21.6 per cent of the total UK growth, with Wales having the largest percentage increase at 23 per cent primarily from Llanwern Solar Farm (75 MW).

- **Bioenergy** capacity grew by 1.3 per cent overall, 5.8 per cent of the total UK growth. England accounted for 85 per cent of this, primarily in the North West mainly from the

[3] Offshore wind is allocated to the region to which its output is connected. The exceptions are Robin Rigg, which comes ashore at Seaton, Cumbria but whose generation is associated with Scotland, Burbo Bank, which comes ashore in Wales but whose generation is associated with the North West and Hornsea Project One which lands in the East Midlands but with grid connection in Yorkshire and the Humber.

refurbishment of Raikes Lane. Within this **AD** (anaerobic digestion) capacity grew by 12.3 per cent overall, England accounted for 82 per cent of AD capacity growth.

Table 1 - Largest new schemes (including capacity increases) in 2021:

Onshore wind	Craiggore	Northern Ireland	24 MW
	Evishagaran	Northern Ireland	47 MW
	Halsary (capacity increase)	Scotland	26 MW
	Windy Rig Wind Farm	Scotland	43 MW
	Beinn an Tuirc III	Scotland	50 MW
	Crossdykes (Community Share)	Scotland	48 MW
	Douglas West & Dalquhandy	Scotland	47 MW
	Gordonbush Ext	Scotland	38 MW
	Aikengall 3 Community Wind Farm	Scotland	76 MW
Offshore wind	Triton Knoll	East Midlands	825 MW
	Kincardine Offshore Windfarm - Phases 1+2 (capacity increase)	Scotland	48 MW
Solar PV	Little Staughton	East of England	50 MW
	Llanwern Solar Farm	Wales	75 MW
Biomass and waste	R100 Energy AD (Waste AD)	Yorkshire and Humber	5 MW
	Colony Farm AD (Farm AD)	East of England	4 MW
	Barnes Farm (Waste AD)	West Midlands	5 MW

The regions with the highest capacity in England (including PV) are:

- Yorkshire and the Humber – 6,314 GW (51 per cent from biomass and waste - mostly from Drax and Ferrybridge – and 37 per cent from wind – mostly from Hornsea Phase One).
- East of England - 6,269 GW (56 per cent from wind and 34 per cent from PV).
- South East - 4,442 GW (50 per cent from PV and 36 per cent from Wind).

Chart 2 – Renewable capacity at the end of 2021 by English region and technology

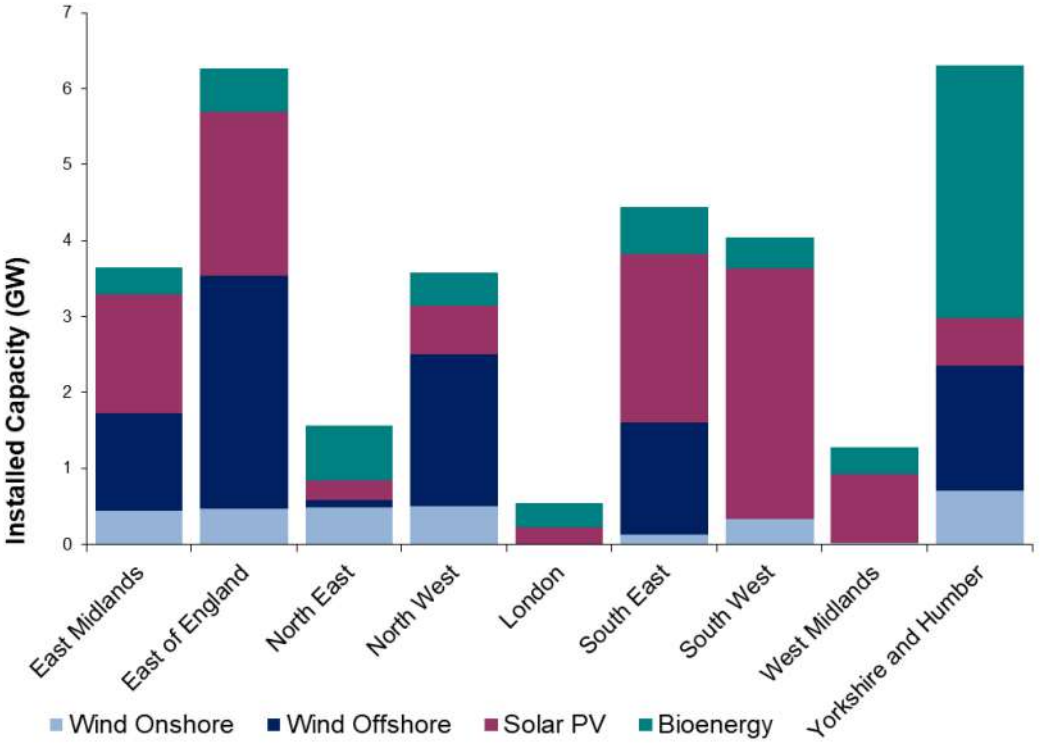


Table 2 summarises capacity growth, the key technologies in each region as well as the major sites. Decreases in capacity are mainly due to capacity revisions:

Table 2: Regional capacity growth

Region	Key Technology	Growth (MW)	Key Schemes
East Midlands	AD	5.3	Angel Wells Farm, Dungehill Farm, Spalford AD
	Biomass and Waste	5.4	Lincoln EFW (capacity revision), 3F Pellets Biomass CHP
	Solar PV	0.7	Mainly medium and small-scale projects, FIT revisions
	Offshore Wind	825	Triton Knoll
East of England	AD	9.0	Alan Bartlett & Sons, Bay Farm, Chicksands Vegetable Processing Plant, Colony Farm AD, GEN0179977_2, McCain Foods Whittlesey, Toggam Farm
	Biomass and Waste	-0.5	Peterborough ERF (capacity revision)
	Solar PV	55.1	Little Staughton, Triangle Solar Farm Park, Willow Farm
North East	AD	2.0	Darlington Farmer's Auction Market, North East Grains Site

	Biomass and Waste	- 3.0	Teesside MSW capacity revisions
	Landfill gas	1.0	ICI No2 (Teesport) Landfill
	PV	2.5	Blyth Sewage Treatment Works, FIT revisions
North West	AD	2.9	Blackdyke Industrial Estate AD, Ellesmere Port Biodiesel Plant, New Smithfield Market
	Biomass and Waste	9.1	Raikes Lane (Bolton Thermal Recovery) back online
	Solar PV	2.2	Daresbury Science Park, Outer Space Studios Solar Panels, Sanko Gosei Solar Panels, South Stilling Tanks Solar Farm
	Onshore Wind	- 0.1	Capacity revision
London	Solar PV	0.3	Advent Way - Solar Panels, Holly Street - Solar PV Panels
South East	AD	9.4	Banbury Sewage Treatment Works, Basingstoke STW, Eastleigh Array Energy Recovery Centre, Sutton Courtenay AD
	Biomass and Waste	0.6	University Of Greenwich Medway Campus
	Solar PV	1.3	Wally Corner Landfill Site, St Peters Hall, capacity revisions
South West	AD	7.1	Bangors Road AD, Gibbet Moor Farm, Netheridge STW
	Biomass and Waste	4.9	MSW capacity revisions
	Solar PV	- 1.1	Butleigh Solar Park, Higher Hill Farm, Duke Of Gloucester Barracks, Knockworthy Farm Solar Park, capacity revisions
West Midlands	AD	8.9	Barnes Farm, Blackmore Park, Longdon Marsh Biogas Project
	Biomass and Waste	5.1	Merevale & Blyth Estate, BREL Wednesbury
	Sewage gas	9.7	Minworth STW Dual Fuel
	Solar PV	8.6	Bourne Road (Strensham) - Extension
	Onshore Wind	1.0	Low Carbon Energy Generation Project - Keele University
Yorkshire and Humber	AD	9.9	Foxhills Industrial Estate, R100 Energy AD, Sheffield Road AD
	Biomass and Waste	1.0	MSW capacity revisions
Northern Ireland	AD	2.7	Numerous small-scale projects
	Biomass and Waste	0.7	Blue Valley , Prime Energy
	Hydro	0.2	Omagh District Council Hydro Plant plus numerous small-scale schemes

	Solar PV	3.1	Solar Farm DFD (Dale Farm) plus numerous small-scale schemes
	Onshore Wind	75.5	Craiggore, Evishagaran
Scotland	AD	6.1	Lochtower AD, Levenseat Recycling facility, Auchentoshan Distillery, Baltier Farm, Edge Farm Composting, Lockerbie Creamery, Skeddoway Farm
	Biomass and Waste	1.4	Gleneagles Hotel Biomass Boiler
	Hydro	4.9	Glen Noe, Glen Kinglass, Barr River, Loch Teacuis
	Sewage gas	0.8	Stirling WwTW
	Solar PV	0.8	Perth Wastewater Treatment Works (Extension) plus small-scale schemes
	Onshore Wind	333.9	Halsary, Windy Rig Wind Farm, Beinn an Tuirc III, Crossdykes (Community Share), Douglas West & Dalquhandy, Gordonbush Ext, Aikengall 3 Community Wind Farm
	Offshore Wind	47.6	Kincardine Offshore Windfarm - Phases 1+2 (capacity growth)
Wales	AD	3.5	Oxland AD, Bryn Posteg AD, Cilgell Isaf AD, Factory Road AD, Nantycaws Landfill AD, St Merryn Meat AD
	Solar PV	75.4	Llanwern Solar Farm & Battery Storage
	Onshore Wind	7.4	Brenig Wind Farm (Resubmission) (capacity growth)

The Feed in Tariff scheme (FiTs) closed to new entrants at the end of March 2019, small-scale PV installations that have come online since April 2019 are now recorded through the MCS (Microgeneration Certification Scheme). Additional work has been undertaken to further improve the local authority allocation of small-scale schemes which are not accredited on FITs. This now covers around 97 per cent of the records for 2019 - 2021, (compared with around 21 per cent of the records for 2019 and 2020 in last year's publication).

Generation

- For similar reasons to capacity, generation from renewable sources in England was almost three times higher than Scotland. England has a lot of bioenergy and Scotland has a lot of onshore wind capacity, bioenergy tends to have higher load factors (see below) than wind but this is offset by England having more solar PV capacity which has a lower load factors.

Number

- Excluding PV, England continues to have the largest number of renewable sites (5,794) followed by Scotland (4,538), Northern Ireland (1,630), and Wales (1,176); the position for the last two countries is reversed when PV is taken into consideration.

- Excluding PV, regions with the highest number in England are the South West, East of England, and Yorkshire and the Humber which each have over 1,000 installations. When PV is taken into consideration, the South East has the highest number of sites followed closely by the South West and the East of England.

Capacity and Generation per GVA

- Economic activity in each country or region is measured in terms of Gross Value Added (GVA)[4]. Scotland continues to show the largest capacity from renewables per £ of GVA followed by Wales, Yorkshire and the Humber, and Northern Ireland.

- In terms of electricity generated, Yorkshire and the Humber (due to Drax) for the first time show the largest generation per £ of GVA, followed by Scotland, Wales and North East.

Load Factors

Load factors are the ratio of how much electricity was generated as a proportion of the total generating capacity. UCLFs or "load factor on an unchanged configuration basis" describes the amount of electricity generated from schemes that have been operating throughout the whole of the calendar year with the same installed capacity configuration[5].

The UCLFs and load factors on a standard basis can be found in the load factor time-series spreadsheets. A summary by country is given in Table 3:

[4] GVA as published in Regional Gross Value Added (Income Approach), December 2015 at:
www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/regionaleconomicactivitybygrossdomesticproductuk/1998to2020
www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalandrealregionalgrossvalueaddedbalancedbyindustry

[5] The formula for calculating this is:

$$\frac{Elelctricity\ generated\ during\ the\ year\ (MWh)}{Installed\ capacity\ of\ schemes\ operating\ throughout\ the\ year\ with\ unchanged\ capacity\ configuration\ (MW) * hours\ in\ year}$$

Table 3 - Load factors on an unchanged configuration basis by UK country and technology:

	Onshore Wind	Offshore Wind	Solar PV	Hydro	Biomass and Waste
England	23.3%	39.2%	10.7%	35.2%	69.7%
Northern Ireland	22.7%	n/a	9.6%	34.4%	62.0%
Scotland	23.1%	34.0%	8.3%	33.2%	67.4%
Wales	25.6%	29.3%	10.6%	22.5%	77.7%
UK average	23.3%	38.1%	10.6%	32.2%	69.7%

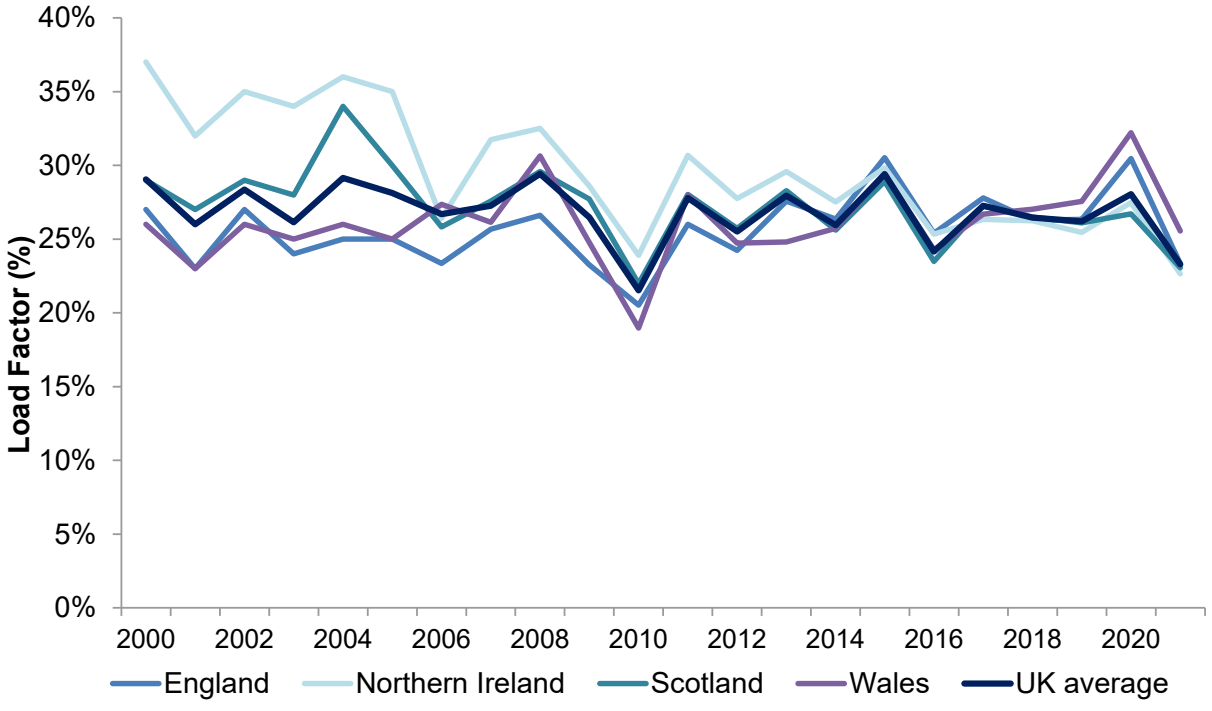
- Wales continues to have the highest **onshore wind** load factor (25.6 per cent), then England (23.3 per cent), followed closely by Scotland (23.1 per cent) and Northern Ireland (22.7 per cent). This implies that there have been some outages and curtailments for some large Scottish wind farms.

- England has the highest load factor for **offshore wind** (39.2 per cent), followed by Scotland (34.0 per cent) and Wales (29.3 per cent), again suggesting output in Scotland may have been reduced by outages and curtailments.

- England also has the highest average load factor for **solar PV** (10.7 per cent), closely followed by Wales, Northern Ireland, and Scotland which is in keeping with the relative solar irradiance in these countries.

- Load factors for other technologies and additional graphs are included in the related spreadsheets.

Chart 3 – Onshore wind Unchanged Configuration LFs since 2001 by UK country



Time series

Capacity and generation have grown at different rates in different regions for each technology, which is partly dependent on the available resource and the support mechanism.

Solar PV: following a period of rapid growth encouraged by the Renewables Obligation (RO) and FiT support mechanisms, the initial fast rate of growth has slowed down, which is also reflected in the corresponding generation figures; this is probably due to a combination of effects including the closure of the RO, a reduction in FiT financial support mechanisms and the rapid exploitation of prime development sites. Similar patterns are seen for other technologies (onshore wind, landfill gas, sewage gas, and hydro).

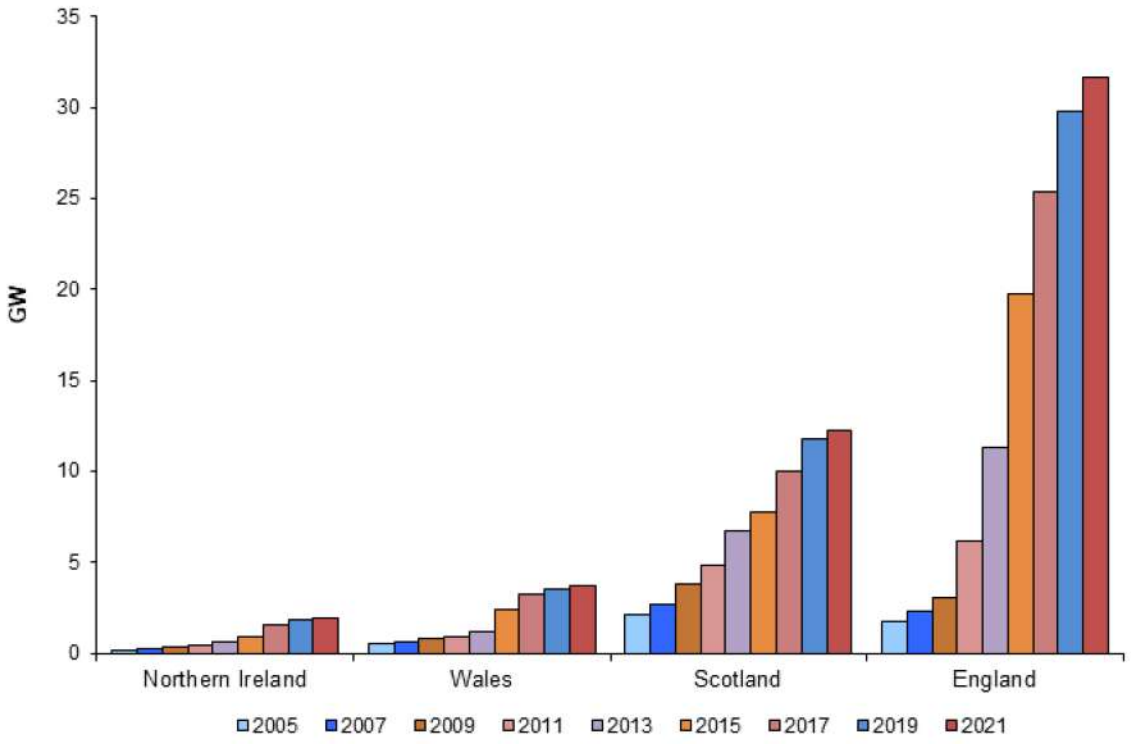
Offshore wind continues to grow. In total, offshore wind capacity grew by 8.4 per cent, accounting for nearly half of the new capacity in 2021. Nearly 95 per cent of this new capacity came from one site alone – Triton Knoll in the East Midlands. Offshore wind capacity has grown more than fivefold in England and nearly fourfold in Wales and Scotland over the last ten years.

Bioenergy: much of the new bioenergy is from biomass and waste. Capacity in England, Wales, Scotland and Northern Ireland all grew by 1 to 2 per cent.

Landfill gas: the rate of exploitation of prime sites reached saturation more than a decade ago but there is no similar plateauing of generation data which instead decreases with time. This is because biogas production rates reduce with time as the biodegradable resource gets exploited.

Chart 4 shows how capacity has grown over time in each country:

Chart 4 – Total renewable capacity by country 2003 – 2021



Local authority analysis

- Tables 4 to 6 rank the top five Local Authorities[6] (LAs), per: number of installations, installed capacity, and generation for key technologies; these are also shown graphically in the Excel spreadsheets.

- In 2019 and 2020, several local authority boundaries were amalgamated with others and now either come under a new name or have undergone a name change. This reporting year, an additional amalgamation has taken place[7] which has been amended in the time-series spreadsheets from 2019 onwards. With such frequent changes taking place to districts, maintaining the original order of listings has become untenable. Therefore, unlike previous data releases, we have deleted empty merged record names and reordered the lists alphabetically.

- **Number of sites:** are summarised in Table 4. Cornwall remains the top-ranked (21,482), reflecting the large number of solar PV schemes installed in the South West. For other technologies, the top ranking LAs for the number of installations for onshore wind, hydro, landfill gas, anaerobic digestion, and plant biomass are the Orkney Islands, Highland, Buckinghamshire, Shropshire, and Mendip respectively.

- **Capacity**: data are summarised in Table 5. Highland is the top ranked local authority, primarily from wind and hydro, followed closely by Selby, primarily from plant biomass (Drax Dedicated Biomass). For other technologies, the top ranking LAs are solar PV (Cornwall), landfill gas (Thurrock), and anaerobic digestion (Shropshire).

- **Generation**: data are summarised in Table 6. Selby is the top ranked local authority, primarily from plant biomass. For other technologies, the top ranking LAs are onshore wind (Highland), PV (Cornwall), hydro (Highland), landfill gas (Buckinghamshire), and anaerobic digestion (Shropshire).

- Cornwall and Wiltshire continue to have large numbers of PV sites with correspondingly high capacity and generation which represents the installation of large solar farms. These are followed closely by Dorset, Peterborough and Aberdeenshire which, between them, have an unusually large number of PV sites. However, they have significantly lower capacities and generation, (with the exception of Dorset) and probably represents the uptake of domestic installations.

- Highland's overall capacity and generation is driven by the construction of large-scale, onshore wind farms. Whilst the Orkneys has the highest number of wind sites (slightly more than three times that of Highland) it has much smaller capacity and generation, suggesting these tend to be smaller projects meeting local needs.

- Shropshire continues to show the highest number, capacity and generation of anaerobic digestion facilities, followed closely by Armagh, Banbridge and Craigavon. This probably reflects the availability of AD feedstock due to the high levels of farming undertaken here.

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[6] Where disclosure of confidential generation data was likely at the site level, this has been addressed, where possible, by replacing this with data from publicly available sources. Where this is not possible, the data have been removed, and added to the unallocated row at the bottom of the Local Authority listings.

[7] "Corby", "East Northamptonshire", "Kettering" and "Wellingborough" are now "North Northamptonshire". "Daventry", "Northampton" and "South Northamptonshire" are now "West Northamptonshire".

In Northern Ireland, the following changes have taken place: "Antrim" and "Newtownabbey" are now "Antrim and Newtownabbey". "Ards" and "North Down" are now "Ards and North Down". "Armagh", "Banbridge" and "Craigavon" are now "Armagh, Banbridge and Craigavon". "Ballymoney", "Coleraine", "Limavady" and "Moyle" are now "Causeway Coast and Glens". "Derry" and "Strabane" are now "Derry City and Strabane". "Fermanagh" and "Omagh" are now "Fermanagh and Omagh". "Lisburn" and "Castlereagh" are now "Lisburn and Castlereagh". "Ballymena", "Carrickfergus" and "Larne" are now "Mid and East Antrim". "Magherafelt", "Cookstown", "Dungannon and South Tyrone" are now "Mid Ulster". "Newry and Mourne" and "Down" are now "Newry, Mourne and Down".

Table 4: Local Authority: Number of sites generating electricity from renewable sources, 2021

Number

Onshore Wind		Solar PV		Hydro		Landfill gas		Anaerobic Digestion		Plant Biomass		Total [b]	
Orkney Islands	787	Cornwall	21,021	Highland	303	Buckinghamshire	9	Shropshire	37	Mendip	30	Cornwall	**21,482**
Aberdeenshire	572	Wiltshire	1,737	Argyll & Bute	127	Thurrock	9	Armagh, Banbridge & Craigavon	33	Dumfries & Galloway	18	Wiltshire	**11,767**
Cornwall	426	Dorset	10,101	Gwynedd	120	Doncaster	8	Derry City & Strabane	28	Herefordshire County of	17	Aberdeenshire	**10,477**
Dumfries & Galloway	300	Peterborough	9,905	Perth & Kinross	89	North Lanarkshire	8	Mid Ulster	28	East Riding of Yorkshire	10	Dorset	**10,154**
Highland	259	Aberdeenshire	9,870	Dumfries & Galloway	84	Warrington	8	Dumfries & Galloway	20	Powys	10	Peterborough	**9,913**
						Wiltshire	8	Herefordshire, county of	20	Shropshire	10		
										Armagh, Banbridge & Craigavon	10		
UK Total	**10,000**		**1,133,645**		**1,576**		**455**		**761**		**450**		**1,147,220**

Table 5: Local Authority: Installed capacity of sites generating electricity from renewable sources, 2021[a]

MW

Onshore Wind		Solar PV		Hydro		Landfill gas		Anaerobic Digestion		Plant Biomass		Total [b]	
Highland	1,888	Cornwall	602	Highland	807	Thurrock	40	Shropshire	20	Selby	2,663	Highland	**2,763**
South Lanarkshire	1,241	Wiltshire	554	Argyll & Bute	300	Buckinghamshire	38	East Cambridgeshire	18	Northumberland	448	Selby	**2,721**
Dumfries & Galloway	799	Dorset	285	Perth & Kinross	278	Central Bedfordshire	33	East Riding of Yorkshire	17	Fife	77	East Suffolk	**1,707**
South Ayrshire	652	South Cambridgeshire	283	Dumfries & Galloway	151	Warrington	32	Mid Ulster	16	Slough	63	North East Lincolnshire	**1,482**
Scottish Borders	641	Shropshire	221	Stirling	86	North Lanarkshire	26	Armagh, Banbridge & Craigavon	14	Sheffield	62	Lancaster	**1,382**
UK Total	**14,492**		**13,965**		**1,891**		**1,056**		**610**		**4,573**		**49,702**

Table 6: Local Authority: Generation of electricity from renewable sources, 2021[a]

GWh

Onshore Wind		Solar PV		Hydro		Landfill gas		Anaerobic Digestion		Plant Biomass		Total	
Highland	4,080	Cornwall	556	Highland	2,900	Buckinghamshire	159	Shropshire	113	Selby	11,375	Selby	**11,465**
South Lanarkshire	2,439	Wiltshire	493	Perth & Kinross	748	Thurrock	115	Mid Ulster	109	Fife	431	Highland	**7,219**
Dumfries & Galloway	1,537	Dorset	266	Argyll & Bute	506	Havering	109	East Cambridgeshire	105	Dumfries & Galloway	366	East Suffolk	**3,299**
Scottish Borders	1,318	South Cambridgeshire	260	Dumfries & Galloway	354	Central Bedfordshire	102	Armagh, Banbridge & Craigavon	94	Sheffield	360	Lancaster	**3,177**
South Ayrshire	1,249	Shropshire	195	Stirling	281	Basildon	92	Derry City & Strabane	84	Neath Port Talbot	351	Dumfries & Galloway	**2,776**
UK Total	**29,153**		**12,138**		**5,496**		**3,313**		**3,256**		**7,086**		**122,178**

Totals include offshore wind sites allocated to nearest Local Authority.

Revisions

Historic revisions this year were carried out to the 2019 and 2020 datasets which have resulted in changes to both capacity and generation for all but two regions. These are due to several reasons including the reassignment of unknown FiT and MCS data from the 'Other' category. There have also been capacity revisions in several data sources: MPP (Major Power Producers) Survey, ROCs (Renewable Obligation Certificates), and the MSIW (Municipal Solid & Industrial Waste) Survey. Other changes include the identification of some duplicates, and the addition of some missing schemes. These revisions are summarised in Table 7:

Table 7: Historic capacity and generation revisions by country

Year	**2019**		**2020**	
	Capacity (MW)	Generation (GWh)	Capacity (MW)	Generation (GWh)
England	338	167	439	140
East Midlands	26	6	35	11
East of England	43	16	57	13
North East	10	3	12	2
North West	34	16	43	17
London	62	44	75	52
South East	70	51	90	37
South West	44	3	61	-5
West Midlands	28	24	37	6
Yorkshire and the Humber	21	4	29	7
Northern Ireland	2	0	0	-6
Scotland	34	26	58	202
Wales	23	10	-2	51
Other	-261	-163	-391	-250
TOTAL	**139**	**41**	**104**	**138**

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Competition in UK electricity markets

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Key headlines

Following privatisation in 1990, the number of UK major electricity suppliers has increased from 16 in 1989 to 35 in 2021. In 2021, 3 companies BEIS surveyed which were over the 0.1% market share threshold in 2020 discontinued supply, and 1 dropped below the threshold.

From 2010 to 2019, electricity market concentration had gradually declined across the domestic, commercial and industrial sectors as more companies entered the market. However, market concentration over the past 2 years increased across all sectors.

The market share of smaller suppliers (outside the top nine) has risen from 2.7 per cent in 2010 to 19.4 per cent in 2021, as new and smaller suppliers took market share from the large companies.

Major power producers (MPPs) have remained relatively stable since 2015, having increased from 6 in 1989 to 54 in 2021.

The top nine MPPs' share of generation increased from 75.8 per cent in 2016 to 77.3 per cent in 2021. Their share of capacity increased from 62.4 per cent in 2016 to 69.5 per cent in 2021 as new smaller generators entered the market.

This article includes information relating to competition in the UK electricity market, formerly published as part of UK Energy Sector Indicators. The article examines the two parts of the industry where there is competition for provision: generation and sales. For both markets, the article describes the number of companies operating, and the market concentrations. The Herfindahl-Hirschman measure (see explanation in methodology notes at the end of this article) is used to provide the market concentration as it provides extra emphasis on the contribution of participants with the largest shares. For electricity sales, this article covers the major suppliers surveyed by BEIS comprising approximately 96% of the market. Major electricity suppliers are classed as those which sold over 0.1% of traded electricity in the reference year (see further information in methodology notes at the end of this article).

Background to changes in the electricity market

The electricity supply industry was restructured in 1990, with competition being introduced to the electricity markets in three phases. First the upper tier of the non-domestic market (customers with a maximum demand of over 1 MW, comprising 30 per cent of the market) was opened to competition in March 1990. Next, the 100 kW to 1 MW tier (15 per cent of the market) was opened to competition in April 1994. Full competition for the remaining 55 per cent of the market (below 100 kW peak load) was introduced in stages between September 1998 and June 1999. This final phase covered domestic consumers who account for over a third of electricity consumed in the UK.

Following the restructuring of the electricity supply industry, the former nationalised companies were classified as major generating companies to distinguish them from autogenerators and the new companies set up to generate electricity. However, over the next few years, some new independent companies were beginning to make significant contribution to the electricity supply and therefore a new terminology "Major Power Producers" (MPPs) was introduced to signify those companies whose prime purpose is the generation of electricity. The breakup of the nationalised power suppliers into smaller privatised companies immediately increased market competitiveness, with new companies beginning to build their own Combined Cycle Gas Turbine (CCGT) stations from 1992. Major wind farm companies and major solar photovoltaic (PV) operators are now also included in the MPP definition.

Competition in electricity sales

The number of electricity suppliers rapidly increased following privatisation, from 16 in 1989 to an early peak of 21 in 2004. From 2004 to 2010, the number of companies reduced to 13, as despite new market entrants, other companies were either taken over or bought additional power stations to add to their portfolios. After 2010, the number of companies increased again, reaching their highest level in 2018 of 39 companies. This reflected new market entrants and BEIS engaging with new, smaller companies to maintain coverage in the more fragmented market. From 2020 to 2021, limited supply, storage, and increasing demand in gas significantly raised the price of fuel used to create electricity. These extra costs contributed to the discontinuation of 4 energy suppliers with over 0.1 per cent of market share, reducing the number of companies to 35. These impacts are likely to have further decreased market competition in 2022.

The number of companies supplying electricity to each sector is given for selected years between 1996 and 2021 in Table 1.

Table 1: Number of companies supplying electricity [note 1]

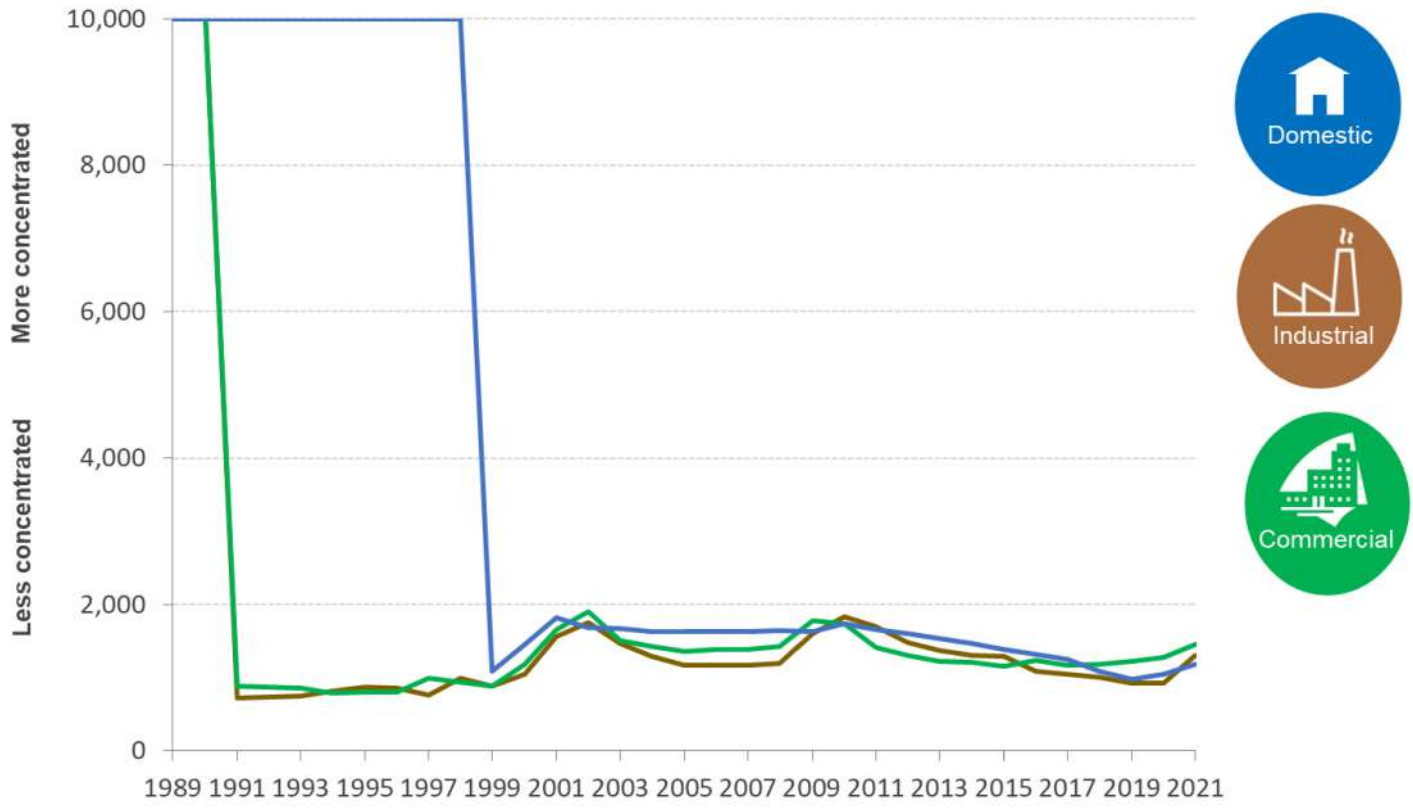
	1996	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	2021
Domestic Sector	1	11	7	10	9	9	8	11	16	19	28	27	23
Commercial Sector	17	13	11	17	12	13	11	17	22	26	29	30	26
Industrial Sector	18	17	14	20	16	15	12	19	21	25	25	27	25
Total	18	18	17	21	19	18	13	21	27	34	39	39	35

[note 1] Companies can supply into more than one market and are counted in each market they supply to. Only includes companies that sold over 0.1% of traded electricity in the reference year.

In 2021, no new electricity suppliers were surveyed by BEIS which supplied over 0.1 per cent of the market share, three companies discontinued supply, and one supplier reduced market share to below the 0.1 per cent threshold for inclusion. All these companies sold electricity in the domestic and commercial markets, whilst two sold in industrial.

Chart 1 below shows the market concentration as expressed through the Herfindahl-Hirschman Index. In the chart, higher numbers show more concentration while lower numbers indicate a more diverse market. Further information on the Herfindahl-Hirschman index can be found at the end of this article.

Chart 1: Herfindahl-Hirschman Index for electricity sales market concentration, 1989 to 2021



There was an initial sharp decrease in market concentration following privatisation, then a rise between 1998 and 2002, mainly due to a spate of mergers. Market concentration again until 2008, where market concentration increased again as several closures reduced the number of market participants. From 2010 to 2019, market concentration again declined in the domestic and industrial sector, with commercial having sharply decreased between 2010 to 2012, then remaining relatively stable from 2012 to 2019.

In 2020 and 2021 both the domestic and commercial market concentration increased due to mergers between large suppliers and suppliers exiting the market.

Industrial market concentration remained stable between 2019 and 2020, however sharply increased in 2021 due to mergers between large suppliers and another exiting the market.

Electricity supplied to all consumers by aggregated shares

Table 2 shows how the market share of the largest companies have changed since 2010. The market share of the top nine suppliers peaked in 2010 but had steadily fallen to 76.8 per cent in 2020. Increasing again dramatically after a major merge. Between 2020 and 2021, the aggregated share of the top six suppliers increased 4.4 percentage points from 62.6 per cent to 67.0 per cent. When compared to 2010, the aggregated top six share for 2021 is 24.0 percentage points lower.

As the number of companies supplying electricity has increased, as evidenced in Table 1, the share of these suppliers outside the top nine has grown. The share of those outside of the top nine rose from 2.7 per cent in 2010 to 23.2 per cent in 2020. This reflected the fragmentation of the market from new entrants taking market share from the larger companies. In 2021 the decrease in share of suppliers outside the top 9 reflects two companies within the top 9 suppliers merging, and rising wholesale electricity prices caused smaller suppliers to discontinue. Decreasing share of suppliers outside the top nine is further reflected in recent increases in market concentration as evidenced by the Herfindahl-Hirschman Index in Chart 1.

Table 2: Percentage shares of total electricity supplied to all consumers

	Market Share (%)								
Electricity Suppliers	2010	2012	2014	2016	2017	2018	2019	2020	2021
Aggregated share of top 3 suppliers	55.4	49.1	47.0	43.7	42.4	41.8	40.9	38.9	48.9
Aggregated share of next 3 suppliers	35.6	36.7	33.9	31.7	31.1	29.0	27.5	23.7	18.1
Aggregated share of next 3 suppliers	6.3	6.2	8.9	10.9	11.7	12.0	11.6	14.2	13.6
Aggregated share of top 9 suppliers	**97.3**	**92.0**	**89.9**	**86.3**	**85.1**	**82.9**	**80.1**	**76.8**	**80.6**
Other suppliers	2.7	8.0	10.1	13.7	14.9	17.1	19.9	23.2	19.4

Electricity generation competition

Table 3 shows the number of companies that are counted as Major Power Producers (MPPs). The number of companies increased rapidly, from six before privatisation up to an early peak of 36 in 2001, before mergers caused numbers to fall back to 29 in 2006. Starting in 2007, several renewable generators were reclassified as MPPs, leading to an increase in the number of MPPs to 34; this remained stable through to 2009. Since 2010, the number of MPPs has steadily increased as new generators came online, reaching a peak in 2017 of 54. This has remained stable up to 2021.

Table 3: Number of Major Power Producers

Year	Number [note 1]	Number producing at least 5% of total generation
1989	6	[x]
1991	11	[x]
1993	20	[x]
1995	25	[x]
1997	27	[x]
1999	30	[x]
2001	36	6
2003	34	6
2005	30	7
2007	34	8
2009	34	8
2011	41	7
2013	44	7
2015	53	6
2017	54	4
2018	54	5
2019	54	6
2020	54	6
2021	54	7

Table 4 shows the MPPs aggregated share of generation and aggregated share of capacity for 2015 to 2021. The market share of the top 9 generators in this period peaked in 2013 at 86.7 per cent declining to 74.8 per cent in 2018, as new companies entered the market and reduced the share of total generation produced by the top 9 companies. This share increased in 2019 and 2020, before decreasing again to 77.3 per cent in 2021. The top 9 generators held a lower share of capacity (69.5 per cent in 2021) compared to generation. This indicates that a greater proportion of their generation was from non-renewable sources, which have higher load factors i.e. they operated closer to full capacity. The top 3 companies aggregated share in generation and capacity decrease between 2017 and 2021 was predominantly due to decommissioned nuclear sites.

Table 4: Percentage of total generation and total capacity by Major Power Producers

	Share in Generation (%)						**Share in Capacity (%) [note 1]**					
	2016	2017	2018	2019	2020	2021	2016	2017	2018	2019	2020	2021
Aggregated share of top 3 companies	48.9	50.7	49.0	48.3	46.4	45.4	32.9	35.3	33.8	42.5	42.2	36.2
Aggregated share of next 3 companies	15.5	15.0	16.6	17.6	21.2	19.0	18.2	22.2	21.4	20.3	15.5	19.7
Aggregated share of next 3 companies	11.4	9.2	9.2	11.6	10.2	13.0	11.4	8.8	11.9	9.2	12.4	13.6
Aggregated share of top 9 companies	**75.8**	**75.0**	**74.8**	**77.5**	**77.8**	**77.3**	**62.4**	**66.4**	**67.1**	**72.1**	**70.1**	**69.5**
Other major power producers	24.2	25.0	25.2	22.5	22.2	22.7	37.6	33.6	32.9	27.9	29.9	30.5

[note 1] Of the same companies in each band in generation terms

Data for this article

The data used to produce this article can be found in Tables 1 to 6 of associated Competition in UK Electricity Markets workbook. Revisions to data in this article are noted here.

Further Sources of Information on competition in UK electricity markets

Ofgem release their own statistics on competition in GB generation and the domestic suppliers' market.

Ofgem list all companies that hold licenses in generation and supply.

The Competition and Markets Authority published a report on competition in energy.

Methodology notes

In this article, **'electricity supplier'** refers to the major electricity suppliers surveyed by BEIS, covering approximately 96% of all UK electricity sales in 2018. '**Major electricity suppliers'** include suppliers that sold over 0.1% of traded electricity in the reference year, this was 253 GWh in 2021. This differs from previous editions of this article where all suppliers surveyed by BEIS were included. The change allows BEIS to increase its survey coverage whilst still presenting comparable trends in this article. Please see the BEIS Electricity statistics data sources and methodologies for more details.

The Herfindahl-Hirschman measure attempts to measure market concentration. It places extra emphasis on the contributions of participants with the largest shares. The measure is commonly used to assess whether mergers should go ahead and whether they will significantly affect the balance of the market in a particular sector. It is expressed by the following equation: Herfindahl-Hirschman measure = the square of each participant's market share added together across all participants in the market. Values vary between zero, which signifies a perfectly competitive industry, and ten thousand, for a pure monopoly.

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Competition in UK gas supply, 2021

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Key headlines

In 2021, the number of large gas suppliers fell to 24 (from 29 in 2020) as significant increases in wholesale gas prices saw a number of market exits. This bucked the trend seen in the past decade of steady growth then stability in the number of large suppliers.

Subsequently market concentration increased in 2021, as closures meant customers were transferred to the largest suppliers. The top nine suppliers accounted for 81 per cent of the market – the highest share since 2013. The market share occupied by the three largest suppliers increased to 41 per cent, from 35 per cent in 2020.

The number of large suppliers to the domestic and commercial sectors fell by four and two respectively in 2021. This led to more concentrated markets, with the commercial sector reaching its highest level of concentration since 2006. The industrial sector remained stable, with no change in the number of large suppliers between 2020 and 2021.

Background

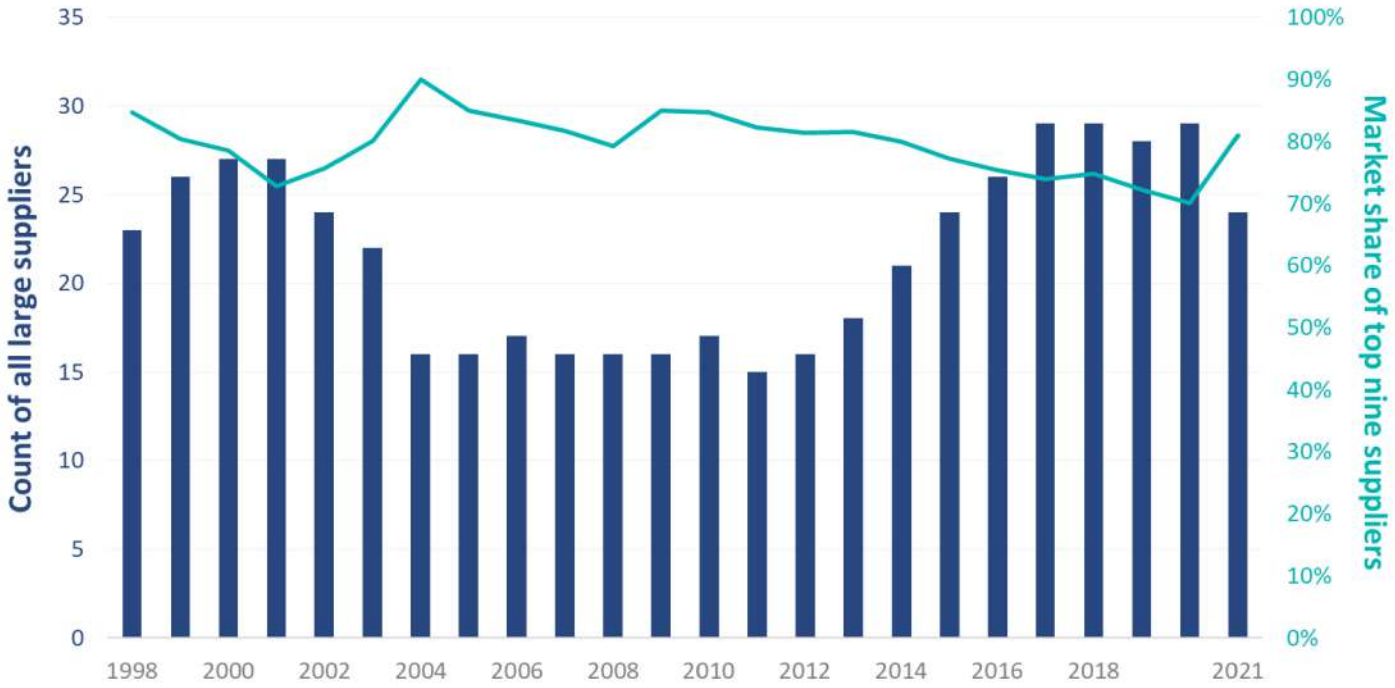
BEIS define suppliers as large or small based on how much gas they supply. A large supplier is one who supplies more than 1,750 GWh per year, and a small supplier is one who supplies less than this. BEIS collect data from companies who are licensed to supply gas. Large suppliers are mandated to provide quarterly data. A sample of small suppliers are asked to provide data on a voluntary basis annually.

Gas supply can be broadly described by key sectors; these are domestic, industrial and commercial in addition to gas supply for electricity generation. This article considers domestic, industrial and commercial sectors.

This article describes the number and size of companies supplying gas to the UK, as well as the market concentration of the domestic, industrial and commercial sectors. Market concentration is assessed using the Herfindahl-Hirschman index; further details on this measure can be found in the methodology note at the end of this article.

Number of UK gas suppliers

Chart 1: Number of large gas suppliers and market share of the top nine suppliers, 1998 to 2021



The process of denationalising UK gas supply began in 1986, continuing for a period of 6 years until 1992. This restructuring of the gas market led to increasing numbers of gas suppliers until 2000. Following this the number of suppliers decreased driven by company mergers. From 2008, favourable market conditions saw numbers generally increase until they reached a peak of 29 in 2017. From 2017, total supplier numbers have been declining although the number of large suppliers remained relatively stable until 2020. In 2021, the number of large suppliers fell to 24 (from 29 in 2020) reflecting several market exits due to unprecedented wholesale gas prices. This was alongside numerous market exits from smaller suppliers who did not meet the large supplier threshold.

From 2017, as small suppliers grew their market share, or moved up into the large supplier category, the market share occupied by the top nine suppliers declined reaching a low of 70 per cent in 2020. This trend was reversed in 2021 when the market share of the top nine suppliers reached 81 per cent, the highest since 2013. This was the result of a number of market exits; the number of large suppliers fell to 24 from 29 in 2020 due to significant increases in wholesale gas prices. Substantial customer numbers were transferred to dominant players increasing their market share.

Table 1: Gas supplied to consumers by aggregate market shares, 2017 to 2021

	2017	2018	2019	2020	2021
Aggregate market share of top 3 suppliers	36.9%	36.5%	38.1%	35.0%	41.3%
Aggregate market share of next top 3 suppliers	21.1%	22.4%	18.6%	21.0%	22.6%
Aggregate market share of next top 3 suppliers	15.8%	15.9%	15.5%	14.0%	17.0%
Aggregate market share of top 9 suppliers	**73.9%**	**74.8%**	**72.3%**	**70.1%**	**80.9%**
Other suppliers	26.1%	25.2%	27.7%	29.9%	19.1%

The gas market has traditionally been dominated by a few major suppliers and in recent years, the market share occupied by the top three suppliers has been fairly stable. However, in 2021 the aggregate market share of the top three suppliers increased to 41 per cent, from 35 per cent in 2020, as customers were transferred to large suppliers when others closed. The next six largest suppliers also saw increases in market share in 2021. This reflects growth in newer suppliers who have increased their customer numbers in recent years. The market share of the sixth to ninth largest suppliers grew to 17 per cent in 2021, the largest since privatisation.

Table 2: Number of large gas suppliers by sector, 2002 to 2021

	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020	2021
Domestic	12	7	6	6	7	7	9	12	16	16	12
Commercial	10	10	7	6	8	8	9	11	11	11	9
Industry	15	10	9	8	8	7	11	11	11	9	9

In the domestic sector, the number of large suppliers steadily decreased between 2005 to 2020 as smaller suppliers entered the market and gained market share. However, in 2021 the number of large domestic suppliers fell by four leading to an increase in the market share of the top nine suppliers. In 2021, the top nine suppliers accounted for 95 per cent of the market and the top three accounted for just over half.

The number of large suppliers in the commercial sector has also grown in the last ten years. Similarly to the domestic sector, in 2021 this was no longer the case and the number of commercial suppliers fell to nine from 11 in 2020. There was a corresponding increase in market share for the top three commercial suppliers, up from 54 per cent in 2020 to 70 per cent in 2021. The nine largest commercial suppliers in 2021 accounted for 95 per cent of the market.

Converse to the domestic and commercial sectors, the number of large suppliers to industry remained stable at nine companies in 2021. The market share occupied by the top three industrial suppliers also remained the same, at 54 per cent, though there was a slight increase in the market share of the top nine industrial suppliers from 91 per cent in 2020 to 94 per cent in 2021.

Competition in UK gas sales

To assess the competitiveness of a market, it is useful to examine standardised measures of market concentration. One such metric is the Herfindahl-Hirschman index, where higher numbers show more concentration and lower numbers indicate a more diverse market. Further information on the Herfindahl-Hirschman index can be found at the end of this article.

Chart 2: Herfindahl-Hirschman Index for market concentration, 1986 to 2021

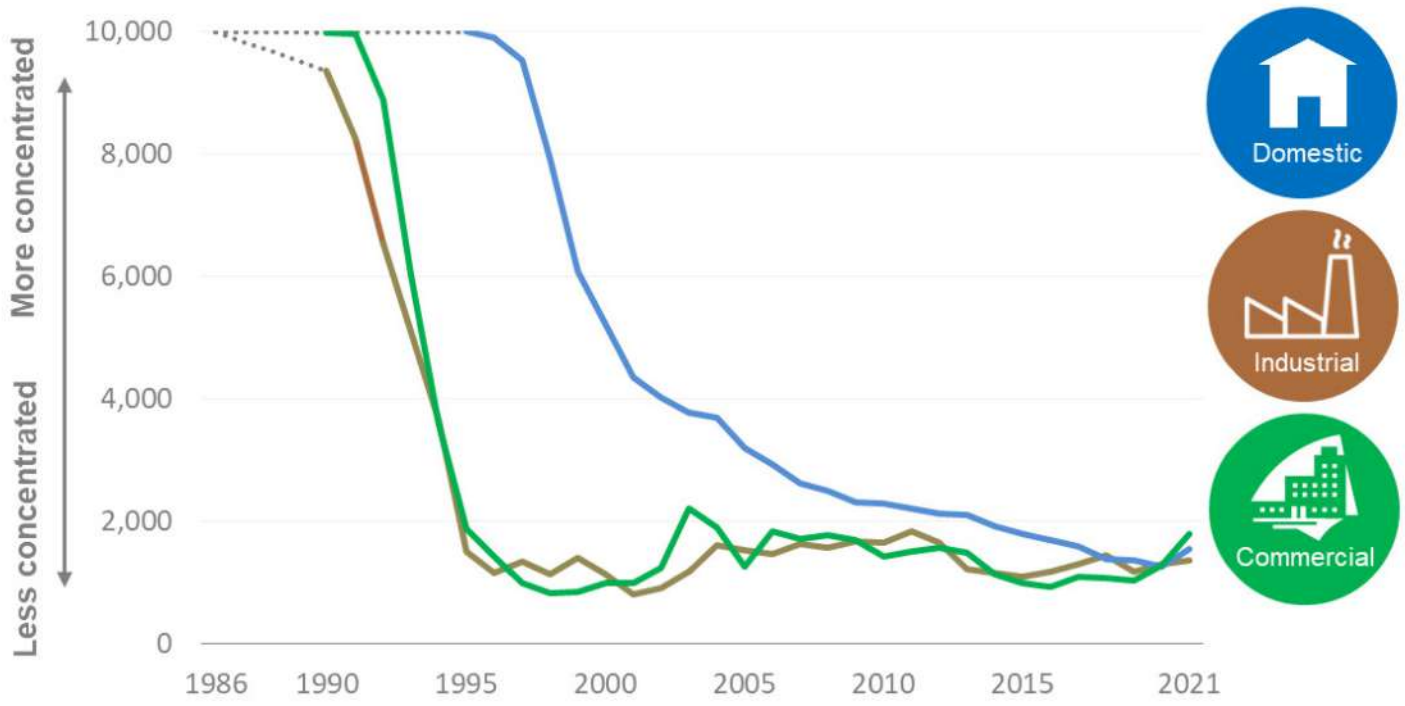


Chart 2 shows gas market concentration as expressed through the Herfindahl-Hirschman index, across the domestic, industrial and commercial sectors. Following the denationalisation of the gas market from 1986 there has been a substantial reduction in market concentration across all three sectors considered here.

The domestic sector saw a consistent year-on-year decrease in concentration until 2020. In 2021, the concentration of the domestic market increased reflecting market exits and increased market share of large suppliers.

In 2021, the commercial sector saw a sharp increase in concentration as two suppliers exited the market. This led the sector to reach its highest Herfindahl-Hirschman score since 2006.

Conversely, the concentration of the industrial sector was relatively stable between 2020 and 2021. This matches the general trend over recent years, which has shown limited year-on-year variation.

Methodology Note: The Herfindahl-Hirschman index

The Herfindahl-Hirschman measure attempts to measure market concentration. It places extra emphasis on the contributions of participants with the largest shares. The measure is commonly used to assess whether mergers should go ahead and whether they will significantly affect the balance of the market in a particular sector.

It is expressed by the following equation:

Herfindahl-Hirschman index = the square of each participant's market share added together across all participants in the market.

Values vary between zero, which signifies a perfectly competitive industry, and ten thousand, for a pure monopoly.

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Diversity of supply for oil and oil products in OECD countries in 2021

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Key headlines

The UK remained self-sufficient in the supply of petrol and was a net exporter as consumption was only three quarters of indigenous production in 2021. The UK was one of 17 other OECD countries who were self-sufficient in the supply of petrol.

The UK returns to being reliant on imports to meet crude supply as scheduled maintenance on the Forties Pipeline System and delayed maintenance from 2020 disrupted indigenous production. Four of 38 countries in the OECD were self-sufficient in their supply of crude, far fewer than oil products. Norway was the most self-sufficient, producing almost eight times what it consumed, and was the only country in the OECD that was self-sufficient in all four oil types.

The UK continues to import oil and oil products from a diverse pool of countries staying above OECD diversity averages for all fuel types.

Background

Countries meet their oil needs through a combination of indigenous production and trade. This article compares how OECD countries manage crude oil and transport fuel demand using data from the International Energy Agency (IEA). The aim is to determine how the UK compares with other OECD countries in how it secures oil supply.

2021 saw changes to demand, production and the security of supply across OECD countries. This was due to continued Covid-19 restrictions on travel and guidance altering transport fuel balances. In the UK, demand for petroleum products increased by 4.1 per cent following 2020 lows. Demand for road fuels, petrol and diesel, increased by 11 and 10 per cent respectively as Covid-19 restrictions eased from April. On the other hand, demand for jet fuel remained muted as international travel restrictions stayed in place for much of the year. UK production of primary oils fell to a 7 year low, at 41 million tonnes, due to an extensive planned maintenance schedule including shutdown of the Forties Pipeline System which serves a substantial proportion of the UKCS. This article seeks to unpack these changes in relation to other OECD countries and trends.

Charting oil self-sufficiency and diversity of supply

- **Self-sufficiency** is the proportion of a country's demand that could be met through indigenous production (as shown on the vertical axis). A score of one indicates that a country produces as much oil as it uses, a score of 0 indicates that no demand was met with indigenous production.
- **A diversity score** is calculated using the number of sources in which a country imports oil, and their respective political stability – defined by the World Bank's governance indicators (See appendix 3 for methodological note).
- **Consumption** is represented by the circle or bubble, the area of which indicates the level of consumption for 2021 for each OECD country.

Bubble charts show the relationship between consumption (size of the bubble), indigenous production (self-sufficiency) and the diversity and political stability of import sources.

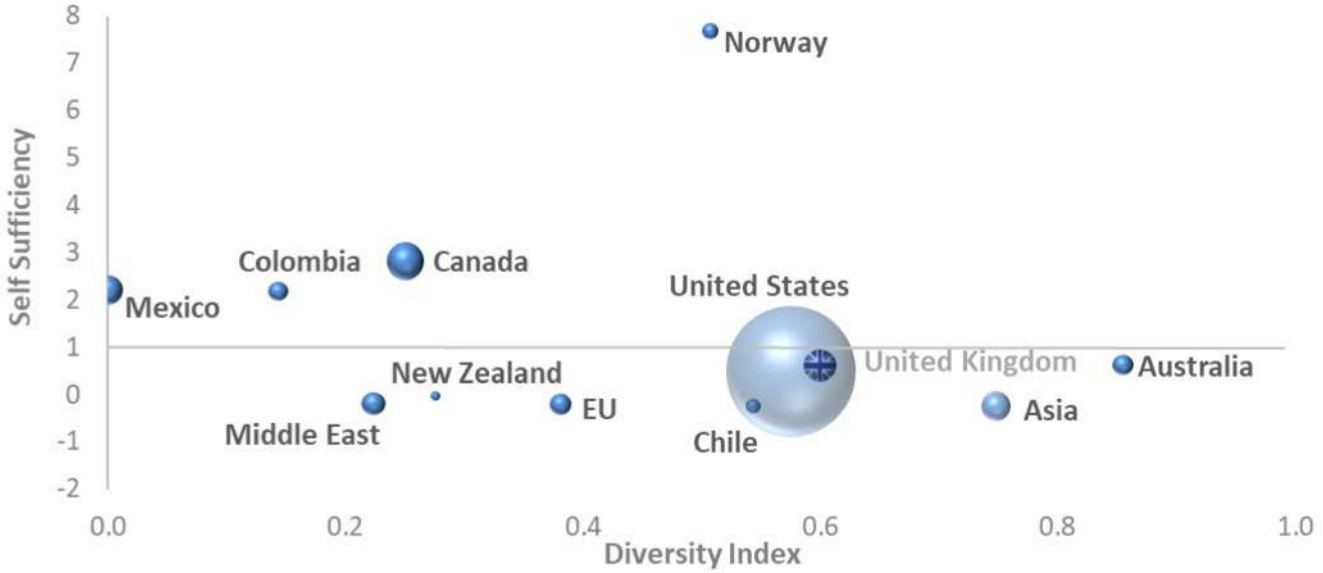
Bar charts provide a means of comparing OECD countries by self-sufficiency and diversity of imports. The sum of these two components is used as a simplified metric for security of supply, and thus does not represent

a full description of security of supply beyond import diversity, stability and self-sufficiency. Appendix 2 shows the underlying data.

Choropleth maps show a visual representation of where OECD countries' oil imports come from. Variable quantities are shown according to colour; darker shades represent a higher proportion of imports originate from that country.

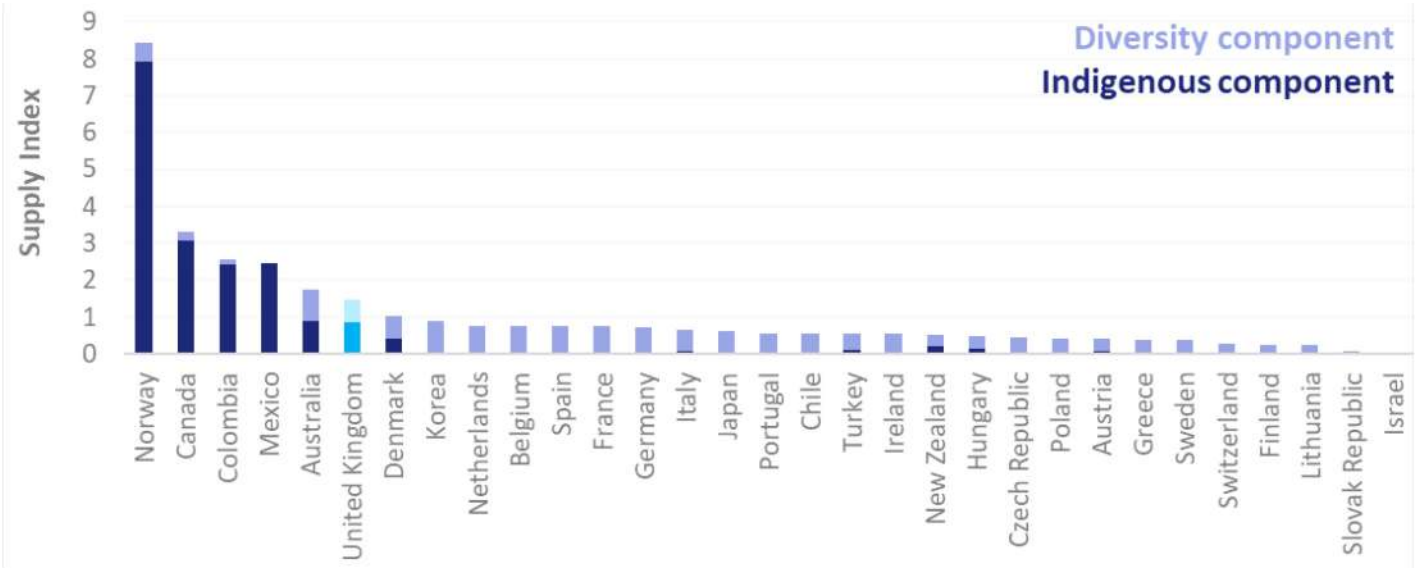
Crude Oil

Chart 1: Diversity and self-sufficiency of crude oil for OECD countries, 2021



With an average self-sufficiency score of 0.51, OECD counties were generally reliant upon imports of crude to meet refinery demand in 2021. Chart 1 shows that in 2021, four OECD countries were self-sufficient in terms of crude oil production. Norway remained a net exporter of crude oil and the most self-sufficient country producing almost eight times its consumption. With a self-sufficiency score of 0.86 (down 15 per cent on the previous year), the UK returned to being a net importer of crude in 2021. This was due to increased demand compared to 2020 alongside a decline in indigenous production due to a significant planned maintenance schedule. This included the shutdown of the Forties Pipeline System, as well as delayed maintenance from 2020. Despite this, the UK ranked sixth out of all OECD countries and was above the average of 0.51. The UK had a diversity score of 0.60 which is also above the OECD average of 0.39.

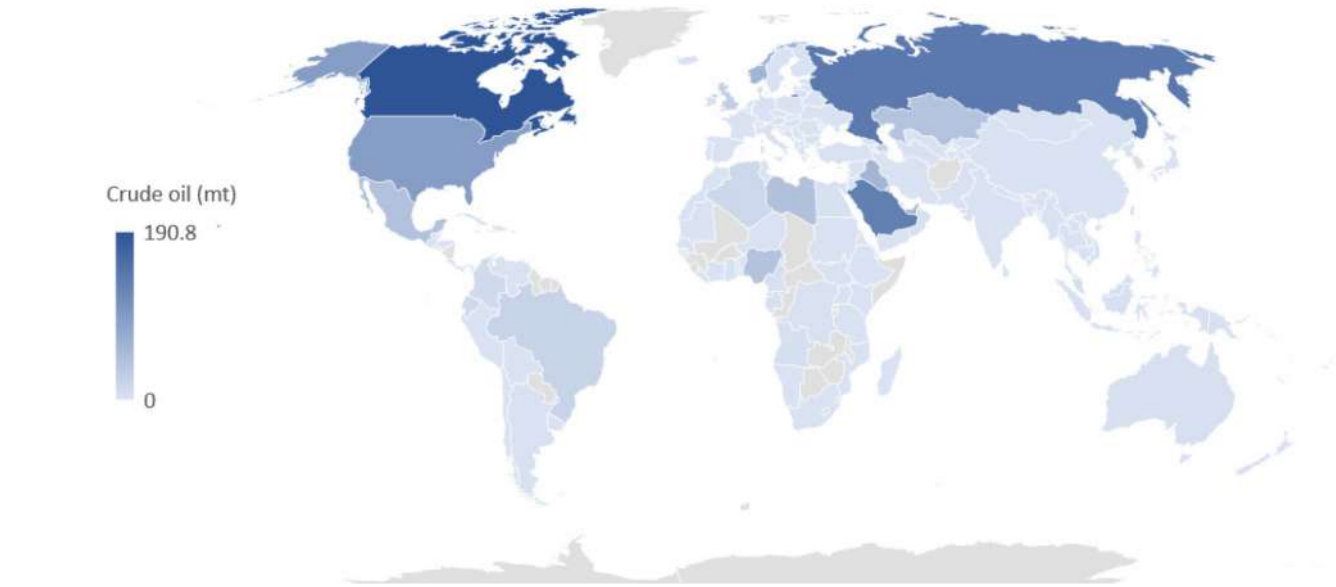
Chart 2: Security of supply of crude oil for OECD countries, 2021



Data not available for Costa Rica, Estonia, Iceland, Latvia, Luxembourg and Slovenia

The simplified security index of supply shows that most OECD countries fulfil supply of crude oil through trade, with a relatively small contribution from indigenous production; almost one third of all OECD countries have no indigenous component to their crude oil supply. Chart 2 shows that the UK has substantial indigenous crude production; in 2021, over half of gross supply was produced domestically.

Map 1: Worldwide crude oil exports to OECD countries (million tonnes), 2021

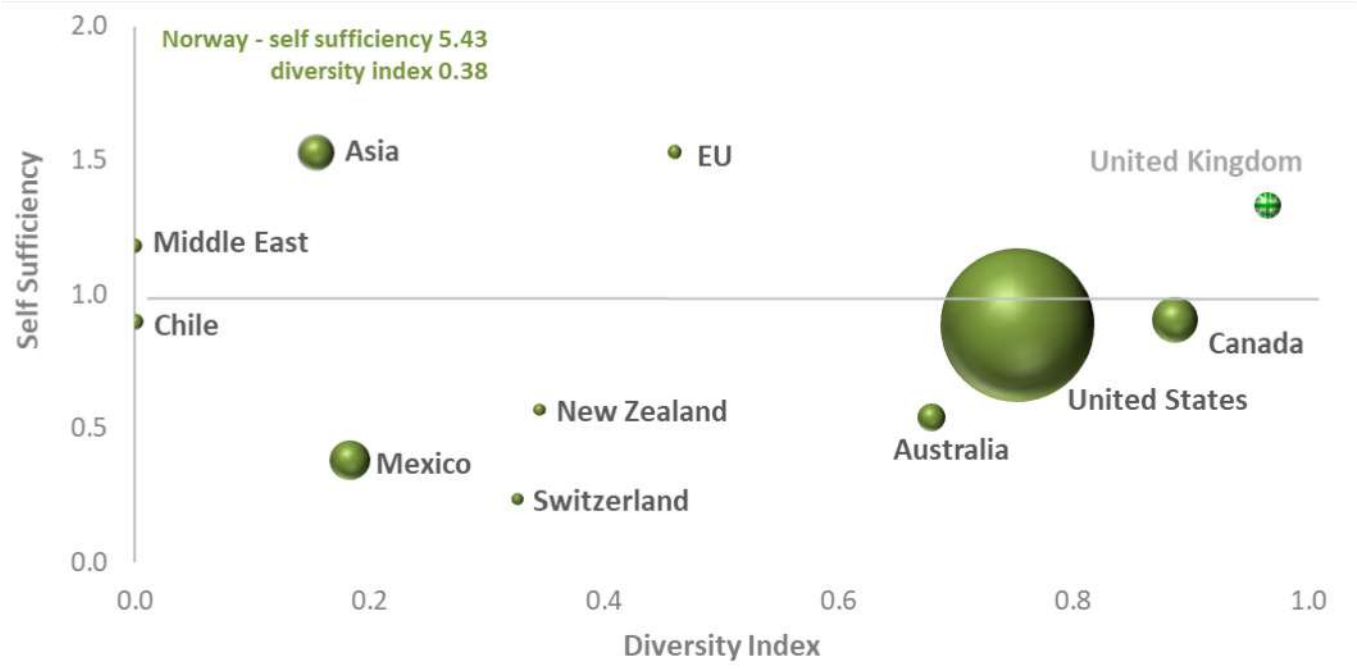


Map 1 illustrates where crude oil exports originated in 2021. Canada, Russia and Saudi Arabia were the largest exporters of crude to OECD countries; Canada exporting the most at 191 million tonnes. Of OECD countries alone, UK exports were fourth highest at 26 million tonnes.

In 2021, the UK imported crude oil from 14 countries, the largest being Norway (36 per cent), the US (30 per cent) and Libya (7.8 per cent). In 2021, the UK imported less than 4 per cent of its crude oil supply from Russia. Following Russia's invasion of Ukraine and subsequent announcements of sanctions this dropped substantially in the first half of 2022. For more information on Energy Imports from Russia please see the Energy trends special feature article.

Petrol

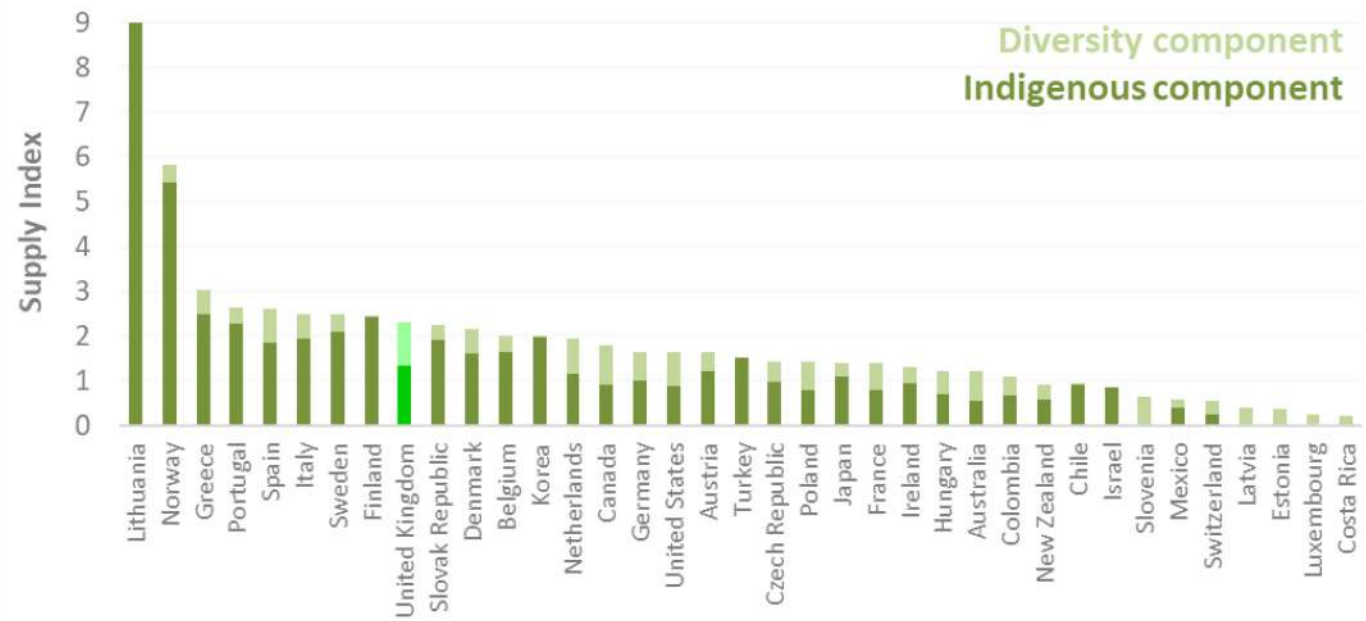
Chart 3: Diversity and self-sufficiency of petrol for OECD countries, 2021



No Diversity Index data available for Middle Eastern countries, Israel and Turkey.

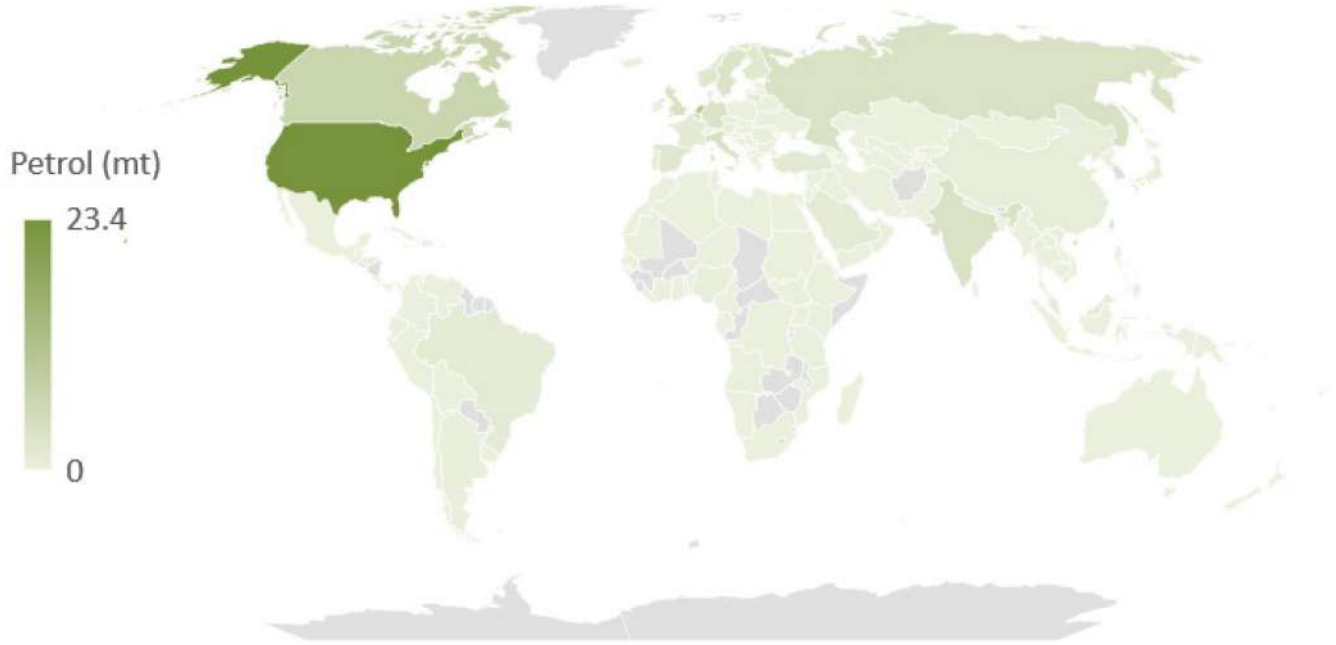
OECD countries were generally self-sufficient in petrol, with an average score of 1.38, above the self-sufficiency threshold of one. Of all oil types, petrol imports were the most diverse with an average score of 0.42. Chart 3 shows that, unlike crude, 17 of the 38 OECD countries were self-sufficient in terms of petrol supply. Lithuania had the highest self-sufficiency score of 9.42 showing that it produced more than 9 times the amount of petrol it consumed. The US constituted 64 per cent of total OECD petrol consumption, dwarfing that of other countries, furthermore, it was one of seven countries that were not self-sufficient in 2021. The UK had a self-sufficiency score of 1.33, meaning that the UK was able to meet demand with indigenous production in 2021.

Chart 4: Security of supply of petrol for OECD countries, 2021



Unlike crude, Chart 4 shows that most OECD countries produce a large proportion of the petrol they consume. The UK ranks ninth for security of petrol supply; but despite being a net exporter undertakes more trade than similarly ranked countries.

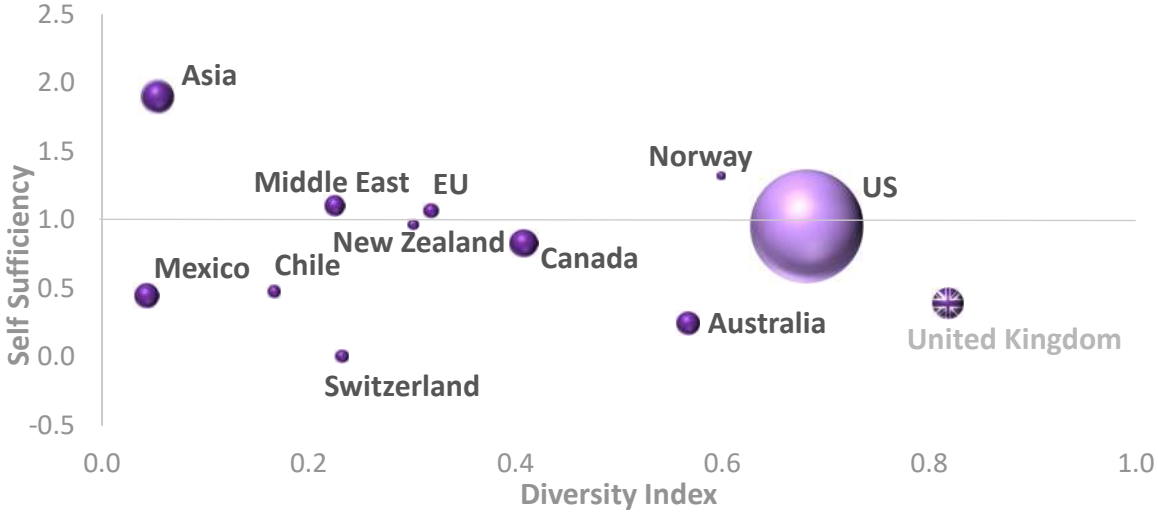
Map 2: Worldwide petrol exports to OECD countries (million tonnes), 2021



The largest exporter of petrol to OECD countries globally was the US, exporting 23.4 million tonnes of petrol in 2021; the US made up almost 30 per cent of OECD petrol imports and 18 per cent of global petrol imports. EU countries also play a significant role exporting petrol; in 2021 EU countries exported 38.2 million tonnes, almost half of the OECD total petrol exports of 81 million tonnes. The Netherlands is one of the largest global oil trading hubs, exporting 11 million tonnes of petrol in 2021. The UK is the seventh largest exporter of petrol in the OECD, exporting 3.5 million tonnes to other OECD countries. Globally, the UK exports almost 8 million tonnes of petrol.

Jet Fuel

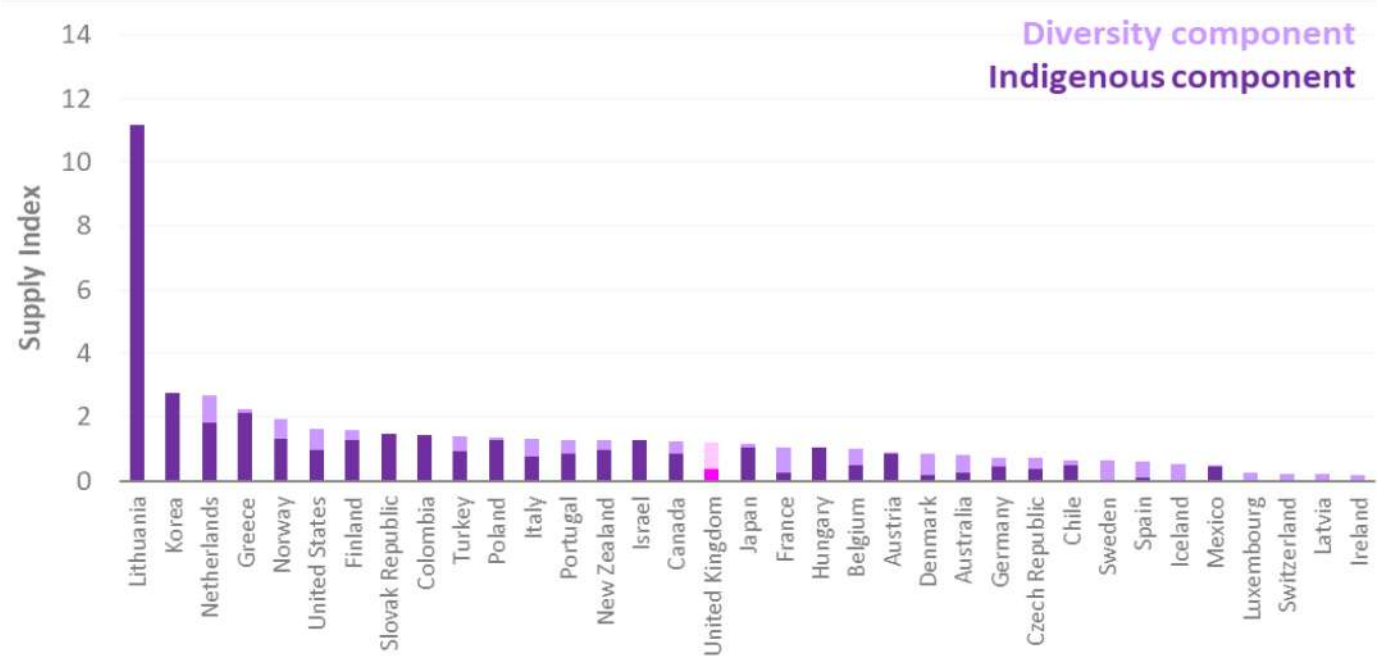
Chart 5: Diversity and self-sufficiency of jet fuel for OECD countries, 2021



Jet fuel imports were the least diverse of the four oil types with an average score of 0.31 as fewer countries produce and export jet fuel in large quantities. As demand for jet fuel increased, the average self-sufficiency score dropped to 0.99 compared to 1.12 in 2020. Lithuania was the most self-sufficient with a score of 11.17 meaning it produced more than 11 times its own consumption, followed by Korea with a score of 2.75 and Greece at 2.13. The UK's self-sufficiency score remained at 0.39, lower than the OECD average. However,

the UK's import diversity score of 0.82 was higher than the OECD average of 0.31. US demand for jet fuel in 2021 made up more than half of total OECD demand increasing by 27 per cent on the previous year, now using more than ten times any other country alone.

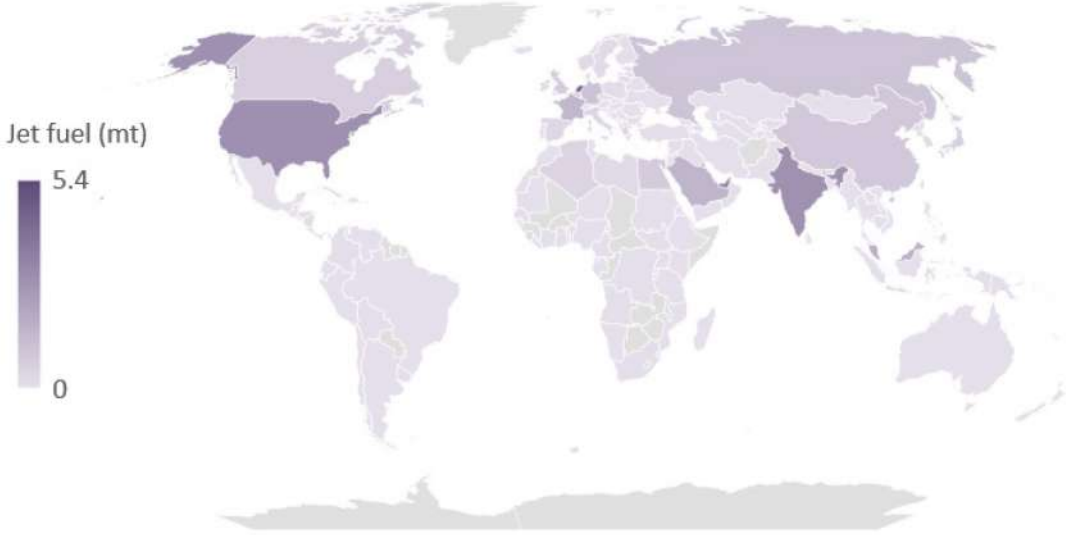
Chart 6: Security of supply of jet fuel for OECD countries, 2021



Data not available for Costa Rica, Estonia and Slovenia

Heathrow is one of the busiest airports in Europe, contributing to the UK's high demand for jet fuel. The UK had the fourth highest demand in 2021, behind the US, Japan and Germany. The UK's small indigenous production results in a small self-sufficiency score of 0.39, below the OECD and EU average.

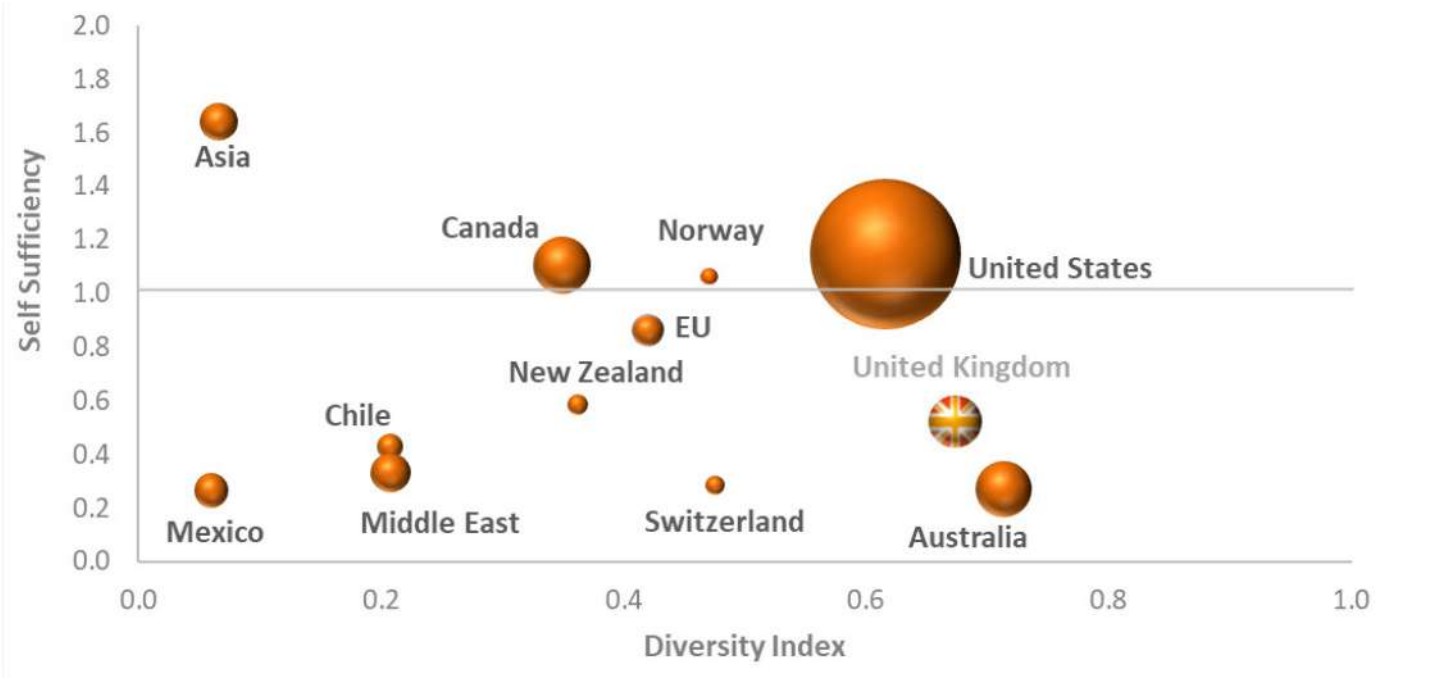
Map 3: Worldwide jet fuel exports (million tonnes), 2021



Unlike crude and petrol, very few countries export jet fuel in large quantities. The largest exporters to OECD countries were Korea, the Netherlands and the US. Korea exported 5.4 million tonnes in 2021, followed closely by the Netherlands who exported 4.6 million tonnes. The UK exported 0.7 million tonnes of jet fuel to other OECD countries and was the seventh largest exporter.

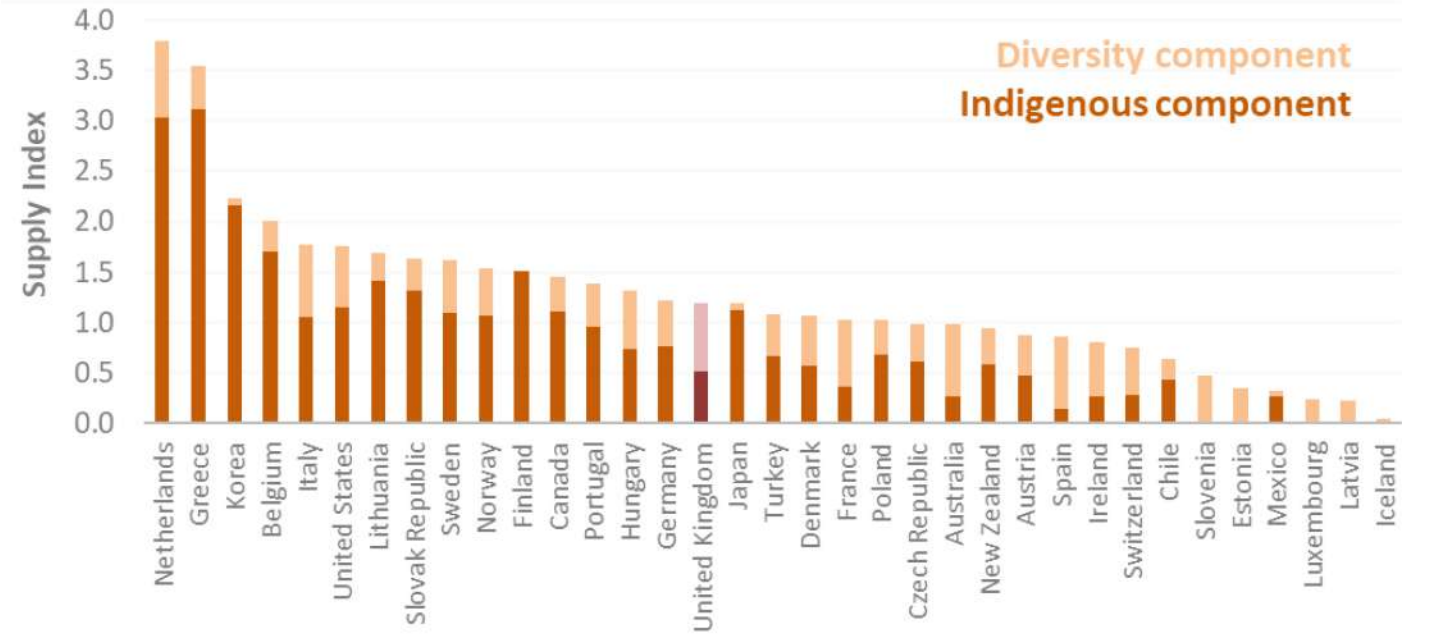
Road Diesel

Chart 7: Diversity and self-sufficiency of diesel for OECD countries, 2021



Diesel was the least secure transport fuel in 2021, with an average self-sufficiency score of 0.78, down nine per cent on 2020. The average diversity score for the OECD was 0.37, down four per cent. In 2021, 13 countries were self-sufficient in terms of diesel supply, and eight countries didn't produce any diesel at all. Chart 7 shows that the UK's self-sufficiency score of 0.52 remained below the OECD average, EU average and below the self-sufficiency threshold of 1. Despite this, the UK had a diversity index of 0.67 higher than the average of 0.37 and the fifth largest in the OECD.

Chart 8: Security of supply of diesel for OECD countries, 2021

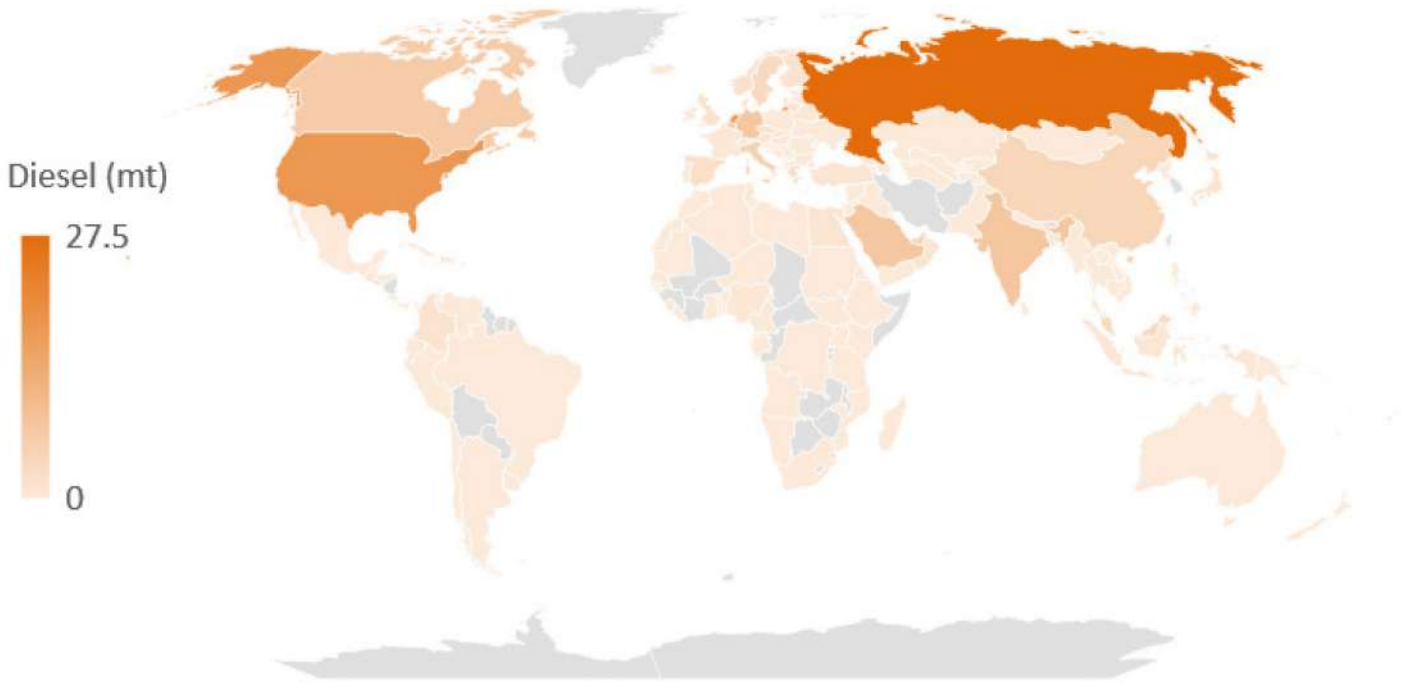


Data not available for Colombia, Costa Rica and Israel

Chart 8 shows that a large proportion of diesel demand was met through indigenous production, but many countries relied upon a combination of both indigenous and diversity components. Finland did not import any

diesel and Korea and Japan imported just three and five per cent of supply respectively. The UK ranked sixteenth out of all OECD countries for security of diesel supply with a score of 1.2, just below the OECD average of 1.3.

Map 4: Worldwide diesel exports to OECD countries (million tonnes), 2021



In 2021, Russia was the largest exporter of Diesel, exporting 27.5 million tonnes followed by the US and the Netherlands each exporting 17.9 million tonnes. Following Russia's invasion of Ukraine many countries including the EU and UK have announced sanctions on Russian energy imports which will come into force in 2022. For more recent data on Russian oil imports to the UK please see Energy Trends Table 3.14.

Summary

The OECD as a whole has a higher security of supply for oil products compared to crude oil. This is because of higher levels of refinery production compared to crude extraction. Nevertheless, the scores for transport fuels are dependent on refining crude oil and therefore should only be considered independently with caution. The average self-sufficiency score for crude oil was 0.51 which shows OECD countries are dependent on imports of crude oil to meet refinery demand. The diversity score for crude oil of 0.39 was much more comparable to transport fuels showing that the OECD has a consistent, wide range of sources of imports.

Out of the three transport fuels, the supply of petrol was the most secure on average for OECD countries. 17 of the 38 were self-sufficient and the average self-sufficiency score of 1.38 suggests that OECD countries are well-placed to meet demand for petrol. The supply of diesel was the least secure transport fuel in 2021. 13 OECD countries were self-sufficient, and the average self-sufficiency score was 0.78 which is below the sufficiency threshold of 1. As demand increased on the previous year, self-sufficiency scores fell by nine per cent on average across all OECD countries.

OECD countries were on average almost self-sufficient in jet fuel supply, with a score of 0.99. However, jet fuel had the lowest diversity score of all fuel types largely due to fewer countries exporting jet fuel at high quantities. Change to demand for jet fuel was varied in 2021 due to differing Covid-19 restrictions on travel. On average, demand increased by 16 per cent driven by large increases for some countries such as 27 per cent in the US, 44 per cent in Mexico and 46 per cent in Japan.

The UK consistently has diversity scores higher than the OECD average for all oil types considered here. The UK is self-sufficient in petrol and a net exporter consuming 71 per cent of indigenous production. The UK is not self sufficient in diesel or jet fuel supply and relies upon a diverse pool of imports to meet demand. The UK was self-sufficient in crude supply in 2020, due in part to the low demand seen during the Covid-19 pandemic. Conversely, in 2021 a significant planned maintenance schedule, including the shutdown of the Forties Pipeline System and delayed maintenance from 2020, saw a 16 per cent decrease in UK primary production which meant the UK was no longer self-sufficient in crude production.

Appendix 1 – List of OECD countries in category averages

Asia
Japan
Korea

EU (excluding UK)
Austria
Belgium
Czech Republic
Denmark
Estonia
Finland
France
Germany
Greece
Hungary
Iceland
Ireland
Italy
Latvia
Lithuania
Luxembourg
Netherlands
Poland
Portugal
Slovak Republic
Slovenia
Spain
Sweden

Middle East
Israel
Turkey

Appendix 2 – Provisional data for 2021

	CRUDE			PETROL			JET FUEL			DIESEL		
	DI	S-S	Demand	DI	S-S	Demand	DI	S-S	Demand	DI	S-S	Demand
Australia	**0.85**	0.88	16,938	0.68	0.54	11,759	0.57	0.25	2,683	0.71	0.27	25,313
Austria	0.33	0.07	8,243	0.41	**1.23**	1,440	0.04	0.85	404	0.41	0.48	6,494
Belgium	**0.77**	0.00	28,736	0.37	**1.64**	1,974	0.53	0.49	1,458	0.30	**1.71**	5,979
Canada	0.25	**3.06**	62,082	0.89	0.91	32,566	0.41	0.84	3,670	0.35	**1.11**	27,127
Chile	0.54	0.01	9,568	0.00	0.90	3,734	0.17	0.48	766	0.21	0.43	5,301
Colombia	0.14	**2.43**	15,872	0.44	0.66	5,306	0.00	**1.44**	647	0.00	0.00	0
Costa Rica	0.00	0.00	0	0.20	0.00	926	0.00	0.00	175	0.00	0.00	994
Czech Republic	0.44	0.01	7,110	0.48	0.96	1,516	0.34	0.39	166	0.38	0.61	5,043
Denmark	0.59	0.43	7,603	0.56	**1.60**	1,309	0.66	0.20	462	0.50	0.57	2,676
Estonia	0.00	0.00	0	0.36	0.00	195	0.00	0.00	66	0.34	0.00	561
Finland	0.25	0.00	7,917	0.02	**2.42**	1,362	0.31	**1.28**	318	0.00	**1.51**	2,489
France	**0.72**	0.02	34,014	0.58	0.80	9,106	0.78	0.27	4,069	0.66	0.37	35,751
Germany	0.70	0.02	84,221	0.65	0.99	19,394	0.27	0.47	6,129	0.45	0.77	34,982
Greece	0.38	0.00	23,661	0.56	**2.48**	2,071	0.13	**2.13**	892	0.43	**3.11**	2,539
Hungary	0.34	0.13	6,724	0.52	0.71	1,515	0.00	**1.04**	135	0.57	0.74	3,518
Iceland	0.00	0.00	0	0.01	0.00	98	0.52	0.00	90	0.05	0.00	403
Ireland	0.53	0.00	3,025	0.38	0.93	588	0.19	0.00	418	0.53	0.27	2,813
Israel	0.00	0.01	11,672	0.00	0.84	3,036	0.00	**1.27**	530	0.00	0.00	0
Italy	0.58	0.08	60,925	0.54	**1.95**	7,412	0.55	0.78	2,194	0.71	**1.06**	22,785
Japan	**0.62**	0.00	125,618	0.31	**1.10**	30,453	0.11	**1.05**	6,406	0.06	**1.13**	20,865
Korea	**0.87**	0.00	130,445	0.00	**1.96**	9,966	0.00	**2.75**	4,454	0.07	**2.16**	18,547
Latvia	0.00	0.00	0	0.40	0.00	182	0.22	0.00	77	0.23	0.00	816
Lithuania	0.23	0.00	7,954	0.54	**9.42**	253	0.00	**11.17**	69	0.28	**1.41**	1,751
Luxembourg	0.00	0.00	0	0.25	0.00	336	0.26	0.00	504	0.24	0.00	1,439
Mexico	0.00	**2.45**	36,867	0.18	0.38	24,820	0.04	0.45	2,894	0.06	0.26	9,258
Netherlands	**0.75**	0.01	51,760	0.80	**1.14**	3,820	0.86	**1.81**	2,381	0.76	**3.03**	5,890
New Zealand	0.28	0.22	3,679	0.34	0.57	2,180	0.30	0.97	549	0.36	0.59	3,175
Norway	0.51	**7.92**	11,034	0.38	**5.43**	763	0.60	**1.33**	351	0.47	**1.06**	2,162
Poland	0.36	0.04	24,755	0.63	0.80	4,877	0.10	**1.26**	575	0.35	0.69	17,936
Portugal	0.56	0.00	9,287	0.34	**2.28**	969	0.43	0.84	793	0.43	0.96	4,208
Slovak Republic	0.08	0.00	5,507	0.35	**1.90**	553	0.00	**1.47**	26	0.31	**1.32**	2,014
Slovenia	0.00	0.00	0	0.64	0.00	369	0.00	0.00	10	0.48	0.00	1,353
Spain	**0.75**	0.00	56,922	0.78	**1.84**	5,244	0.52	0.09	3,358	0.72	0.14	21,813
Sweden	0.38	0.00	18,247	0.40	**2.08**	2,194	0.60	0.04	415	0.52	**1.10**	5,023
Switzerland	0.29	0.00	2,289	0.33	0.23	2,131	0.23	0.01	784	0.47	0.28	2,722
Turkey	0.45	0.10	34,413	0.00	**1.52**	3,029	0.45	0.94	3,512	0.42	0.66	24,952
United Kingdom	0.60	0.86	44,476	0.97	**1.33**	10,793	0.82	0.39	4,673	0.67	0.52	22,870
US	0.57	0.74	748,489	0.75	0.89	376,565	0.68	0.96	63,111	0.62	**1.15**	185,961
OECD Asia average	**0.75**	**0.00**	**128,031**	**0.15**	**1.53**	**20,210**	**0.05**	**1.90**	**5,430**	**0.07**	**1.64**	**19,706**
OECD EU average	**0.38**	**0.04**	**19,418**	**0.46**	**1.53**	**2,903**	**0.32**	**1.07**	**1,087**	**0.42**	**0.86**	**8,186**
OECD Middle East average	**0.22**	**0.06**	**23,042**	**0.00**	**1.18**	**3,033**	**0.22**	**1.10**	**2,021**	**0.21**	**0.33**	**12,476**
OECD average	**0.39**	**0.51**	**44,738**	**0.42**	**1.38**	**15,390**	**0.31**	**0.99**	**3,164**	**0.37**	**0.78**	**14,145**

Items in bold highlight those countries where indigenous production exceeded domestic consumption

DI = Diversity Index
S-S = Self-sufficiency

Demand is in thousand tonnes (kt)

Source IEA (http://data.iea.org/)

Appendix 3 – Methodology

Data for crude oil and transport fuel self-sufficiency
Data for crude oil, petrol and jet fuel were extracted from the IEA database. For diesel, data were provided on request from the IEA. Self-sufficiency was determined from data on indigenous production and consumption (production (kt) ÷ consumption (kt)).

Crude oil and transport fuel diversity indices
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. The Shannon-Wiener index is of the form:

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

Where x is the proportion of total fuel supply represented by the ith 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 2 represents a country with a wide range of import sources. The minimum value of zero denotes a country that has one imported fuel source or relies entirely on indigenous production.

A previous comparative study on import diversities in Energy Trends March 2011 used the Herfindahl Index as the basic diversity index. Although both indices have their advantages, the Shannon-Wiener was chosen here as this represents the data with less skew, as well as placing more weight on the diversity of contributions from smaller countries and lessening 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)

Once Shannon-Wiener and political stability indices were determined, these were multiplied and summed:

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

Where b is an index of political stability of the country exporting. This is called the SWNI (Shannon-Weiner-Neumann index), in line with previous work.

Each SWNI index was normalised for each petroleum product between 0 and 1, 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 product, 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.

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Combined Heat and Power in the regions

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Key headlines

The distribution of CHP across the UK continues to reflect each region's economic landscape, prevailing in areas with energy-intensive industries, such as Yorkshire and Humberside.

Reciprocating engines represent almost 90 per cent of CHP technologies, although only 114 gas turbines account for around 61 per cent of qualifying electrical capacity.

CHP generation of heat and power mostly stalled in 2021, although overall electricity and gas demand both increased (by 1.2 and 5.9 per cent respectively) as Covid-19 restrictions were eased.

Combined Heat and Power (CHP), sometimes referred to as cogeneration, is the simultaneous generation of electricity and heat resulting in improved efficiencies when compared to meeting electricity and heat demands separately. This article provides additional regional information on CHP using data produced in support of The Digest of UK Energy Statistics (DUKES), Chapter 7 (https://www.gov.uk/government/statistics/combined-heat-and-power-chapter-7-digest-of-united-kingdom-energy-statistics-dukes

Over the course of 2021, 66 new sites came online in the UK, accounting for around 55 additional MW of electrical capacity. Around a third of the new sites were located in North West and South East.

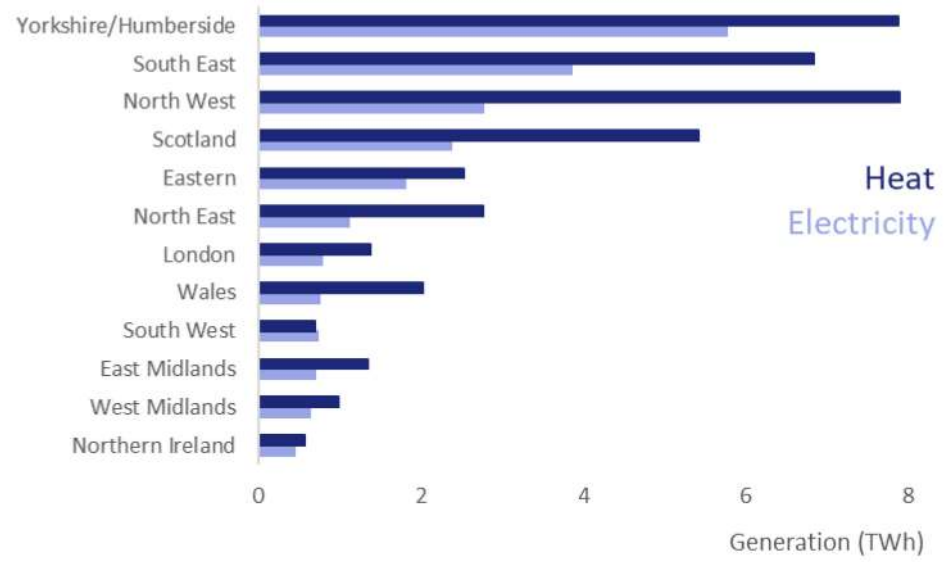
Figure 1. Number of schemes and capacity by region in 2021[1] (Table 1)

Figure 1 shows Yorkshire and Humberside has the highest CHP capacity including the UK's largest scheme resulting in the highest average capacity (Table 1) across the regions (11.4 MW, markedly higher than the next highest at 3.4 MW for the North East). Northern Ireland has the lowest average capacity (1.0 MW), and the region with the highest number of schemes is the South East (average capacity at 3.2 MW).

[1] Prior to publishing DUKES, BEIS undertook a methodology change for CHP statistics, which is summarised in the methodology annex at the end of the article. These changes entailed removing a number of sites from the tables and can influence some year-on-year trends.

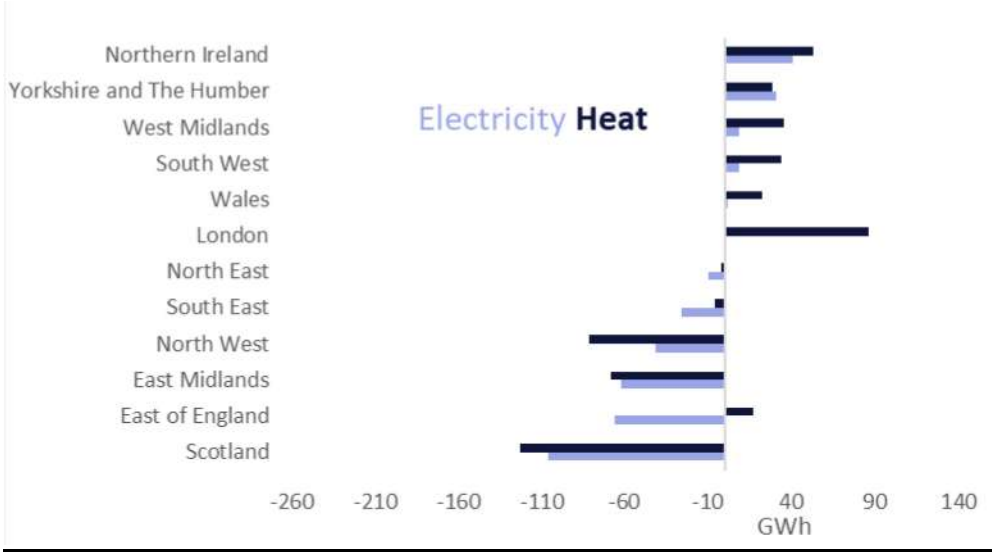
Yorkshire and Humberside represents just over a quarter of total electricity generation though the Northwest accounts for the highest share of heat (20 per cent). (Table 2).

Figure 2. Heat and electricity generation by region in 2021



UK wide, both electricity and heat outputs remained stable between 2020 and 2021, though there were regional variations.

Figure 3. Net change between 2020 and 2021 for heat and electricity outputs



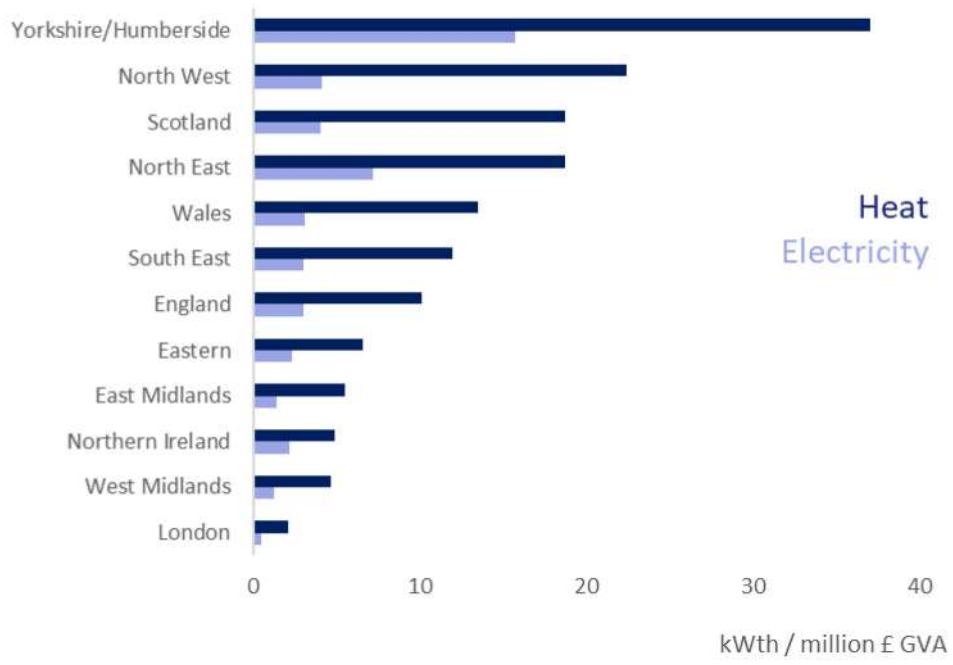
For most regions, heat and electricity generation varied with similar growth rates. Where the trends differ it tends to reflect the nature of the sectors where the CHP schemes are installed. For example, London saw a net increase of 86 GWh in heat generation between 2020 and 2021, the highest among the regions in absolute terms, but electricity generation remained unchanged. This discrepancy can be likely explained by a recovery of sectors with a strong prevalence of community heat schemes (such as hospitality, leisure and office buildings), which make up a considerable proportion of CHP schemes located in urban areas.

Table 5 shows the distribution of capacity across the different sectors and regions with London accounting for almost half of all capacity in the electricity, gas, steam and air conditioning supply sector which includes district and community heating schemes. The chemicals sector which, along with oil refineries, is suitable for CHP, is concentrated in the North East, the North West and Yorkshire and Humberside; taken together these regions account for over 80 per cent of CHP capacity in those sectors.

The large share of capacity employed in vehicle manufacture in the West Midlands is in line with the importance of this region to the automotive sector. More than a third of all capacity in the food and drink sector is in the Eastern region reflecting the large heat demands associated with sugar manufacture. The concentration of large horticultural sites (i.e. Greenhouses) in South East England helps to explain the deployment of 46 per cent of all agricultural capacity in this region. The distribution of capacity serving public administration, mostly hospitals and education, tends to align with population density.

To determine CHP's contribution relative to how much a sector contributes to the regional economy as a whole, capacity per unit of GVA is compared in Table 4 and Figure 4 below. Yorkshire and Humberside represents the highest proportion reflecting not only the concentration of favourable CHP sectors in that region (particularly oil refining on the Humber Estuary) but also its high share of the regional economy. Conversely, although CHP capacity in the vehicle sector is concentrated in the West Midlands (58 per cent), vehicle manufacturing represents a comparatively lower share of the regional economy.

Figure 4. Relative importance of CHP in the regional economies in 2021



Tables 6 and 7 show the regional split of installed qualifying electrical capacity by prime mover (Table 6) and by size range (Table 7). At this level of disaggregation, some regions show only the totals to prevent disclosure due to the small number of sites.

Gas turbines, whether on their own or as part of Combined Cycle Gas Turbines (CCGT), continue to account for the bulk of CHP capacity. In 2021, just 114 schemes of the CCGT and Open Cycle Gas Turbine (OCGT) technologies accounted for 61 per cent of total qualifying CHP capacity.

Reciprocating Engines represent 89 per cent of all schemes, but only 28 per cent of qualifying capacity. London, the South East and the North West account for 38 per cent of these schemes, specifically in high population density areas with high heat demand from leisure centres, hotels and retail outlets, suited to the capacity range and heat grade offered by reciprocating engines.

Future plans

This article is based on data produced for Chapter 7 of DUKES, and in the interests of timeliness, BEIS is planning to bring forward publishing the regional data tables accompanying this article to align with DUKES commencing 2023.The intention is that the tables will form an additional regional Excel workbook, and the article text will be condensed and will either form a short section of Chapter 7 or be contained in a 'Highlights' tab within the workbook.

Methodology Annex: Removal of legacy schemes.

For the current publication cycle, BEIS has taken a decision to remove old ("legacy") schemes from the database if no new data has been received in the preceding nine years. Prior to this decision, schemes that no longer submitted data were carried forward indefinitely, and generation was estimated using the most recent submission available.

These changes were implemented in the 2022 edition of DUKES resulting in some step changes and an artificial downward trend in the data. The changes were applied on a rolling basis from reference year 2019 only, meaning that a first large step change occurs between 2018 and 2019. Moreover, as the nine-years cut-off window rolls forward every year, there are revisions for the following years too. Another step change is apparent between 2020 and 2021, the result of a large number of schemes being added in 2012. As the nine-year limit has now passed with no new data being received, these have now been removed.

A total of 734 schemes has been identified whose last submission pre-dates 2012, with most of them being rolled over as estimates. Although numerous, these sites are mostly fairly small in terms of capacity and generation, so the observed impact is less apparent. Table A below shows the impact on the number of schemes and associated capacity by region. London represented over a third of the schemes removed, while Northern Ireland was the only region which saw a net increase in the number of schemes in 2021. Combining Table A with Table 1 in the accompanying spreadsheet, the artificial trends introduced can be isolated to reveal the underlying trends in the data.

Table A. Breakdown of number and capacity of schemes removed.

	Number of schemes removed			Capacity removed (MWe)		
	2019	2020	2021	2019	2020	2021
East Midlands	25	3	17	9.3	0.6	2.7
East of England	25	13	9	2.8	1.3	1.5
London	53	7	107	9.8	0.7	32.7
North East	11	2	16	0.8	0.2	2.0
North West	51	6	32	5.1	0.8	8.3
South East	45	18	24	5.9	1.7	4.0
South West	26	5	16	4.4	0.8	5.4
West Midlands	37	6	25	2.6	0.8	6.6
Yorkshire and The Humber	26	7	24	22.5	1.0	15.9
Scotland	22	4	13	3.1	1.5	2.2
Wales	21	6	11	1.7	0.4	1.8
Northern Ireland	17	2	2	6.7	1.4	0.2
Total removed	**359**	**79**	**296**	**74.6**	**11.2**	**83.3**
% of current	**16.2%**	**3.5%**	**14.7%**	**1.2%**	**0.2%**	**1.4%**

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Proposed changes to Energy Trends tables 3.6 and 3.11

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Background

Energy Trends is published by the Department for Business, Energy and Industrial Strategy (BEIS) on a monthly basis. Supplementary tables including provisional quarterly balances are published on a quarterly basis concurrently in March, June, September and December.

This note outlines proposed changes to the Energy Trends Tables 3.6 (quarterly) and 3.11 (monthly) both of which include data on UK stocks of petroleum, to be implemented from October 2022.

Proposed change to published tables

Table 3.6 includes data on stocks of petroleum at the end of a given quarterly or annual period. Table 3.11 includes data on stocks of petroleum at the end of a given monthly, quarterly or annual period. The quarterly and annual periods are the same in both tables 3.6 and 3.11 and subsequently BEIS propose that table 3.6 is no longer published. This would result in no loss of published data.

Proposed change to oil type breakdown

Table 3.11 (and 3.6) includes data on stocks of petroleum disaggregated by the listed oil types. When considering petroleum products other Energy Trends tables (for example 3.14) use a further disaggregation of products to allow for analysis of trends at product level. The proposed changes outlined below would align the table with others. The proposed oil type breakdowns are shown in the table below alongside the current breakdown.

Current breakdown	**Crude oil and refinery process oil**					**Petroleum products**						
	Refineries [note 2]	Terminals [note 3]	Offshore [note 4]	Primary net bilaterals [note 5]	**Total primary stocks**	Motor spirit [note 6]	Kerosene [note 7]	Gas/ Diesel Oil [note 8]	Fuel oils	Other products [note 9]	Product net bilaterals [note 5]	**Total product stocks**

Proposed breakdown	**Crude oils**			**Refinery process oils**		**Total primary oils**		**Petroleum products**							
	Refineries [note 2]	Terminals [note 3]	Offshore [note 4]	Refineries	Terminals	Primary net bilaterals [note 5]	**Total primary oil stocks**	Petrol [note 6]	Jet fuel [note 7]	Diesel [note 8]	Burning oil	Heating oil	Other products	Product net bilaterals [note 5]	**Total product stocks**

Note subsequent totals columns remain the same

The key changes to the proposed breakdown are:

- Separation of crude oil and refinery process oils
- Separation of kerosene into jet fuel and other kerosene
- Separation of diesel and gas oil

These changes would allow the user to consider purely primary oils i.e. crude oil and key transport fuels i.e. jet fuel and diesel. This would result in no loss of published data.

We believe that these changes result in no loss of published data and enhance the usability of that data. To provide feedback please contact oil-gas.statistics@beis.gov.uk.

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