



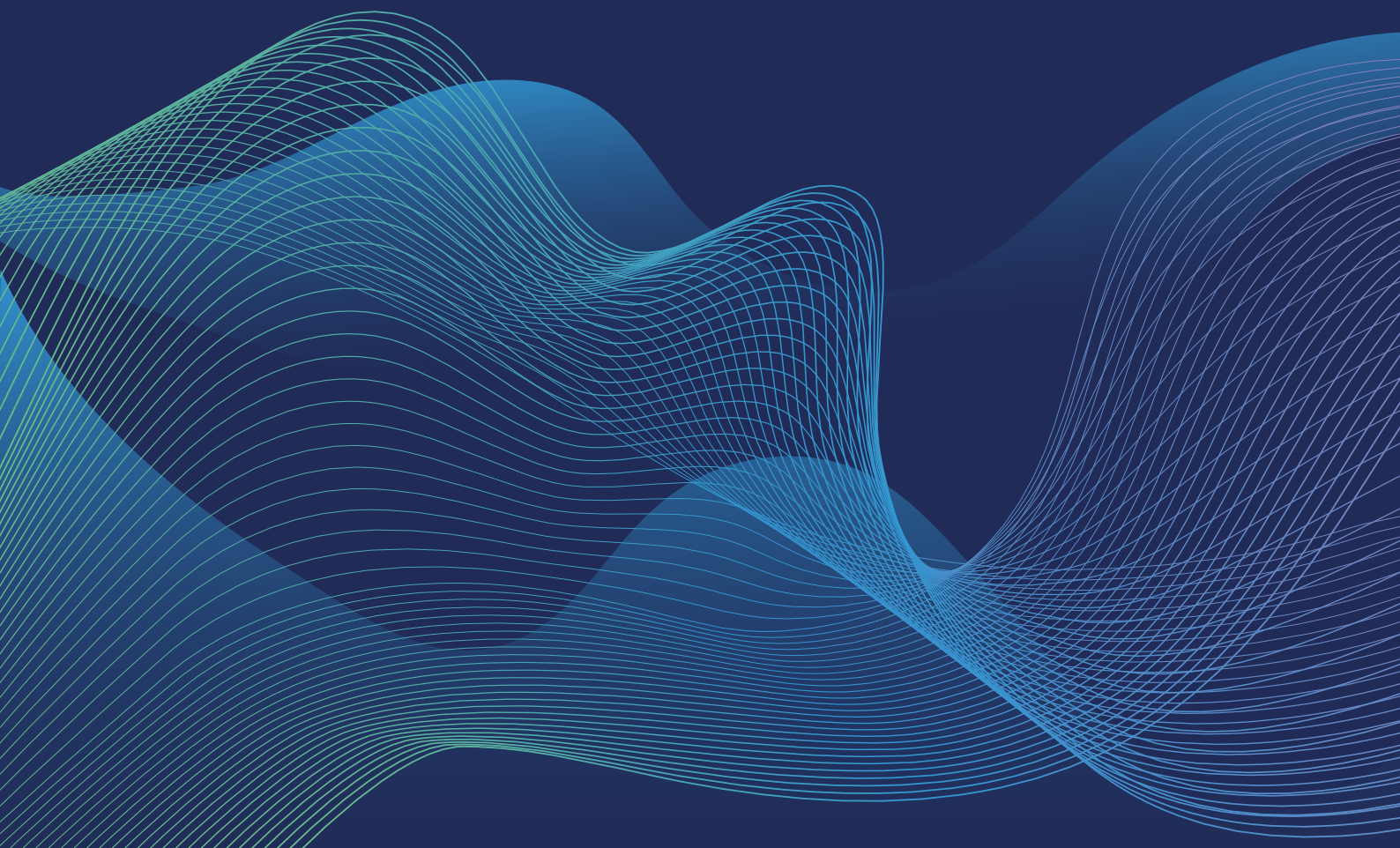
**Global Electricity
Review 2021**
G20 Profile

EMBER
COAL TO CLEAN ENERGY POLICY

UNITED KINGDOM

The UK tops the G20 for wind's
share of power generation

March 2021



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**About Ember's
Global Electricity
Review**

This annual report analyses electricity data from every country in the world to give the first accurate view of the global electricity transition in 2020. It aggregates generation data by fuel by country from 2000. 68 countries comprising 90% of world electricity generation have full-year data to 2020 and have formed the basis of an estimate for changes in worldwide generation. All remaining countries have full data as far as 2019. G20 countries, which comprise 84% of world electricity generation, each have a separate in-depth country analysis. All the data can be viewed and downloaded freely from Ember's website.

www.ember-climate.org/global-electricity-review-2021

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UNITED KINGDOM

The UK tops the G20 for wind's share of power generation

Wind generation is rapidly replacing coal, which is declining faster in the UK than any other G20 country.

"The UK is leading by example in terms of replacing coal generation with renewables. A quarter of the UK's electricity was produced by wind turbines in 2020, a higher proportion than any other G20 country. The impressive rate of growth in renewable electricity has occurred in conjunction with a rapid coal phase-out. Wind and solar are also beginning to reduce fossil gas generation, creating an opportunity for the UK to build a fossil-free power sector."

Sarah Brown

Senior Electricity Analyst-Europe, Ember

Key findings

1 The UK produced a greater share of electricity from wind than any other G20 country in 2020

24.2% of the UK's electricity was produced from wind turbines in 2020. This is over four times the global average of 6% and took the UK ahead of Germany to lead the G20. The UK's wind generation has increased by 83% (+34 TWh) since 2015. This growth, combined with a rise in solar of 6 TWh and a fall in demand of 33 TWh, has replaced 71 TWh of coal generation between 2015 and 2020.

2 The UK has achieved the G20's fastest decline in coal generation since 2015

Coal use in the UK power sector has collapsed by 93% (-71 TWh) between 2015 and 2020. This is the greatest rate of decline of any G20 country by a huge margin and way ahead of Italy and Germany at 65% and 51% respectively. Coal now accounts for a mere 1.7% of electricity production, significantly below the global average of 34% and the fourth lowest share in the G20.

3 The fall in the UK's fossil gas generation in 2020 was the highest in the G20

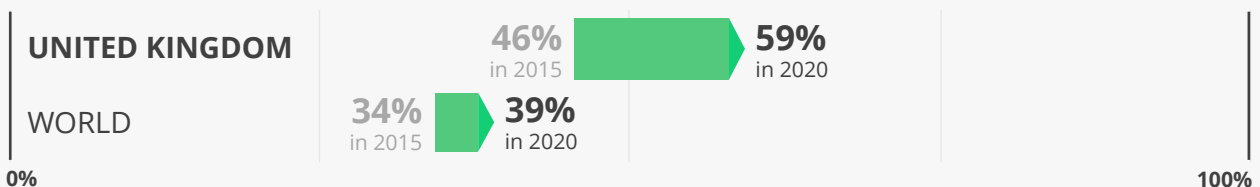
Fossil gas use fell by 15% (-20 TWh) year-on-year in the UK. France was next with 9% (-3 TWh). However, this was predominantly due to Covid-19's impact on electricity demand. The UK still produces 37% of its electricity from fossil gas, placing it ninth in the G20 and above the global average of 23%.

4 UK electricity demand per capita has declined more in the last decade than any other G20 country

At 4.8 MWh/capita it is still 1.5 times the global average, but the substantial decrease of 20% since 2010 places the UK's per capita electricity demand below Italy and China. The UK's electricity demand has been falling every year since 2010. This equates to 58 TWh (-15%) in total. 2020 saw the highest annual decline of 5.5% (-17 TWh) due to Covid-19. Only Italy experienced a greater demand impact with a drop of 6.1%. However, the UK's demand had recovered to normal levels by December.

Progress to 100% clean electricity

Percentage of all renewables & nuclear in total generation



Progress on phasing out coal

Percentage of coal in total generation

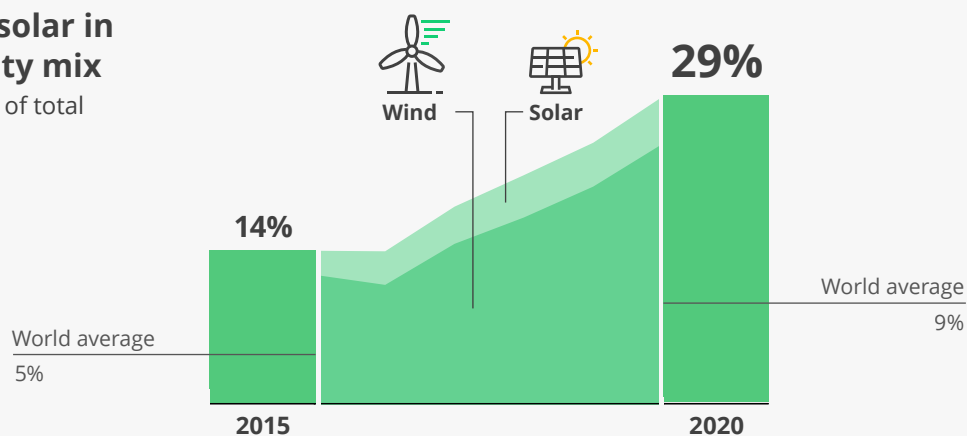


The UK's electricity transition in the spotlight: 2015-2020

Wind and solar triple the global average

Wind & solar in electricity mix

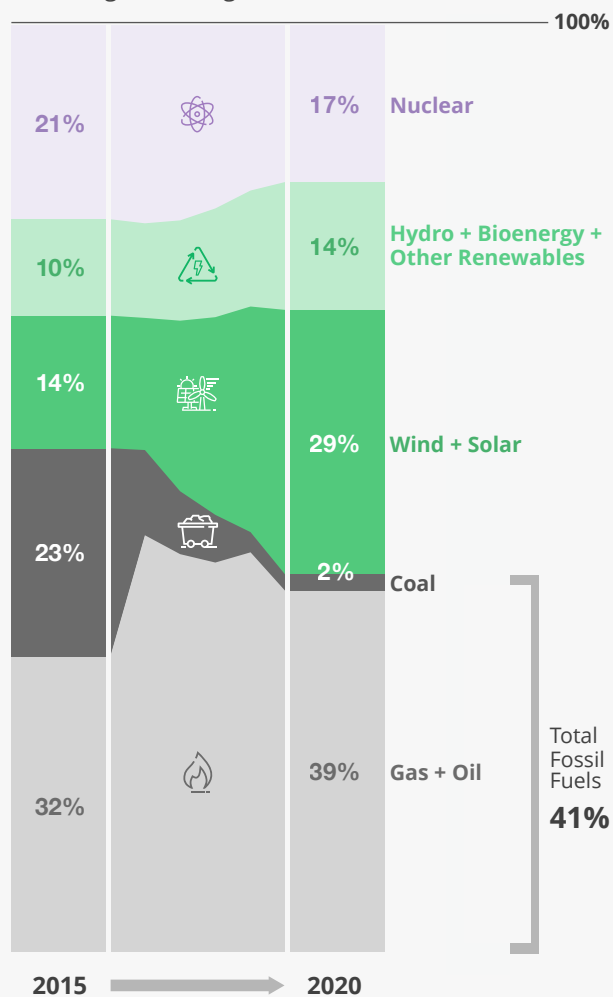
Percentage of total generation



Wind and solar wipe out coal's market share

Electricity mix

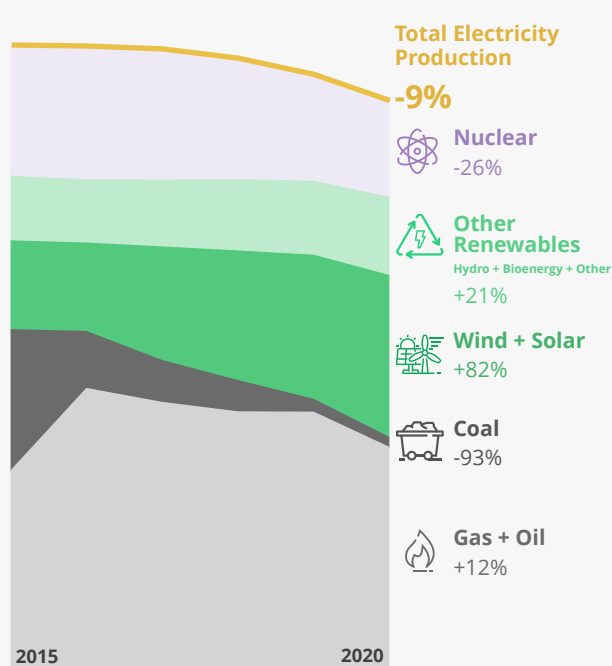
Percentage of total generation



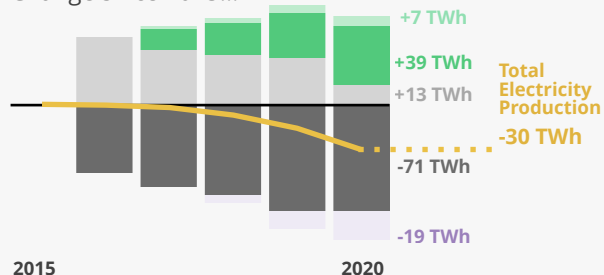
Coal use in the UK power sector has collapsed by 93%

Electricity generation

Terawatt hours



Change since 2015...



The UK is leading the G20 in terms of renewables replacing coal generation.

2020 was the first year that renewables produced a higher proportion of the UK's electricity than fossil fuels. They accounted for 42% of the electricity mix versus 41% for fossil fuels. The share of electricity generation provided by fossil fuels has fallen by fourteen percentage points since 2015, while renewables have increased their share by eighteen percentage points. The biggest loser has been coal. The 71 TWh drop in coal generation was more than compensated for by renewable generation increasing by 47 TWh and demand falling by 33 TWh.

Electricity generation from renewables has increased by 56% since 2015.

This impressive growth is due to wind and solar generation rising by 39 TWh to 87 TWh, a gain of 82%. Wind generation alone jumped by 83% (+24 TWh) and solar by 77% (+6 TWh). Bioenergy's share of the electricity mix has grown by 25% since 2015, raising concerns about the [true emissions](#) embodied in the wood pellet feedstock.

Installed capacity for wind and solar increased by 10 GW (to 25GW) and 6 GW (to 14 GW) respectively from 2015 to 2020. The UK has the largest capacity of offshore wind in the world. New solar capacity additions peaked in 2015 (+4 GW) and capacity only increased by 500 MW in both 2019 and 2020. New wind capacity has been more consistent, averaging 2 GW per annum from 2015 to 2019, but it also only saw a 600 MW increase in 2020 (73% less than in 2019).

In November 2015, the UK government announced that it intended to phase out unabated coal generation by 2025.

As a result, coal generation has tumbled from 76 TWh in 2015 to a mere 5 TWh in 2020 (-93%). Coal now only accounts for 1.7% of the UK's total electricity production compared to 23% in 2015. Due to this progress, the government has now committed to phase out coal by 1 October 2024.

Coal was partially replaced by an increase in fossil gas production of 12% (12 TWh).

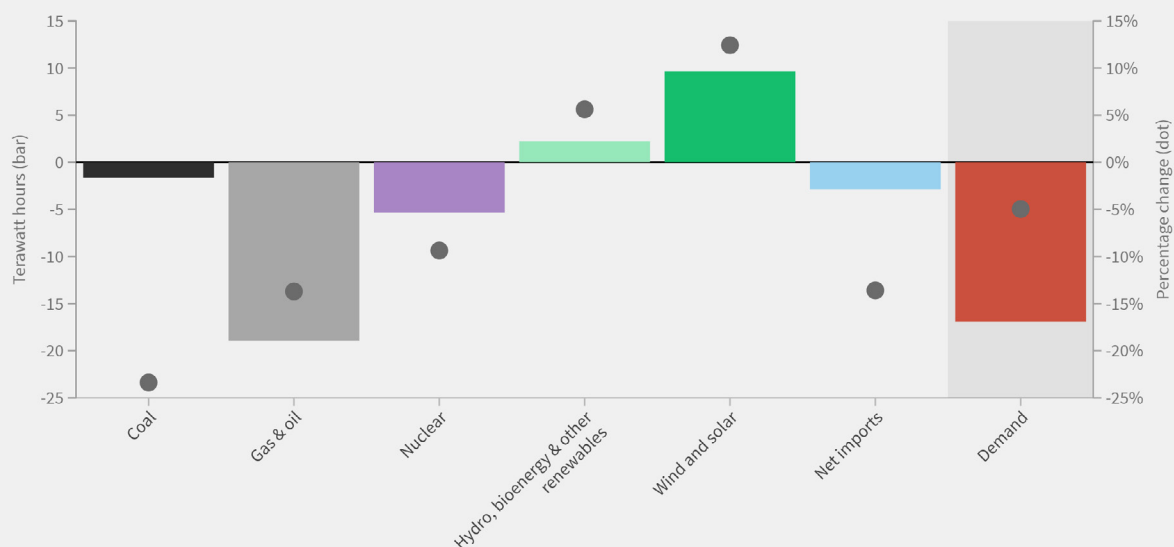
Fossil fuels still provided 41% of power generation in 2020. However, fossil gas has fallen since 2015 and substantially dropped in 2020 by 15% (-20 TWh). This fall was partly down to the Covid-19 related reduction in demand but, thanks to the continued growth of wind and solar, is now a structural decline. The UK's [Energy White Paper](#) commits to an "overwhelmingly decarbonised power system in the 2030s" and, in the UK's Climate and Change Committee's [Sixth Carbon Budget](#), a 2035 fossil gas phase-out is recommended.

The UK's electricity demand has been dropping every year since 2010. It has declined by 15% from 382 TWh in 2010 to 324 TWh in 2020. The UK's demand per capita remains almost 1.5 times the global average (4.8 versus 3.3 MWh/capita) but this has fallen by a fifth in the last decade. This is the largest percentage drop of any G20 country and brings the UK's per capita demand below Italy's.

What happened in 2020?

United Kingdom - Electricity changes in 2020 by source

Year-on-year change



Wind and solar electricity generation increased by 12% (+10 TWh) in 2020. Wind made the greatest gains at 14%, solar grew 3%. As a result, a quarter of the UK's electricity was generated by wind turbines (74 TWh). This significantly ate into fossil fuels' share of production and enabled the UK to achieve a milestone of [renewables overtaking fossil fuels](#) for the first time.

Coal continued its decline in 2020, with generation falling a further 23% to only deliver 1.7% of the UK's electricity. Rising wind and solar and falling electricity demand (-17 TWh) due to Covid-19 caused fossil gas generation to fall by a considerable 20 TWh (-15%). This was the highest percentage decline in the G20 by a significant margin; the next was

France with 9%. It was also a five-year low for UK fossil gas generation at 112 TWh. Despite this, fossil gas remains the UK's single largest power source, generating 37% of UK electricity in 2020.

The UK experienced the second largest percentage drop in demand of any G20 country at 5.5%. Only Italy's was higher at 6.3%. It was also the biggest annual fall the UK has seen during its decade-long decline in electricity demand.

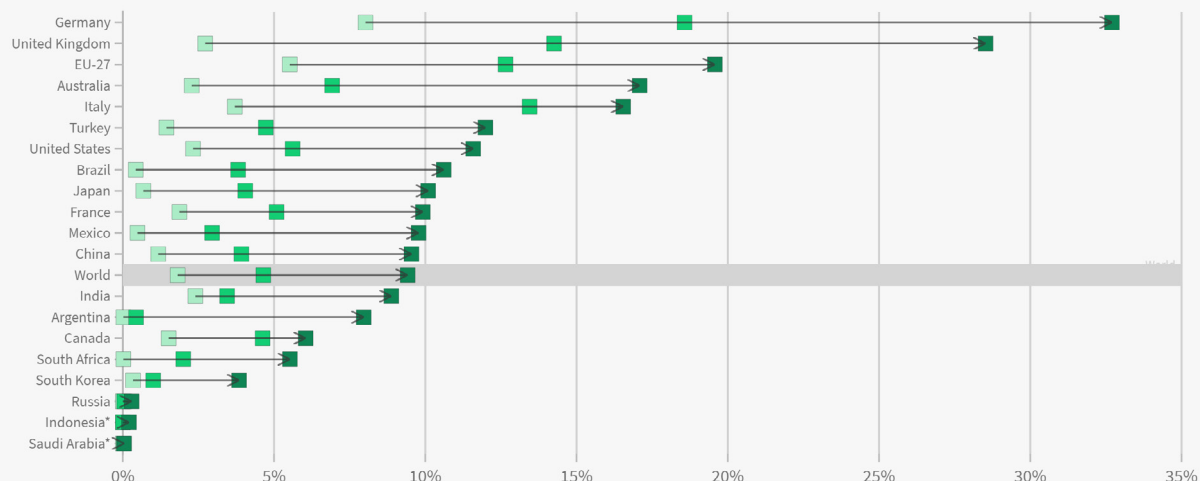
Nuclear generation also fell by 9% to 52 TWh. Bioenergy production hardly changed year-on-year, accounting for 12% of production.

The UK's transition in comparison with G20 countries

The UK is ranked second in the G20 for wind and solar's share of electricity

Wind and solar as % share of electricity production for G20 countries

Year 2010 2015 2020



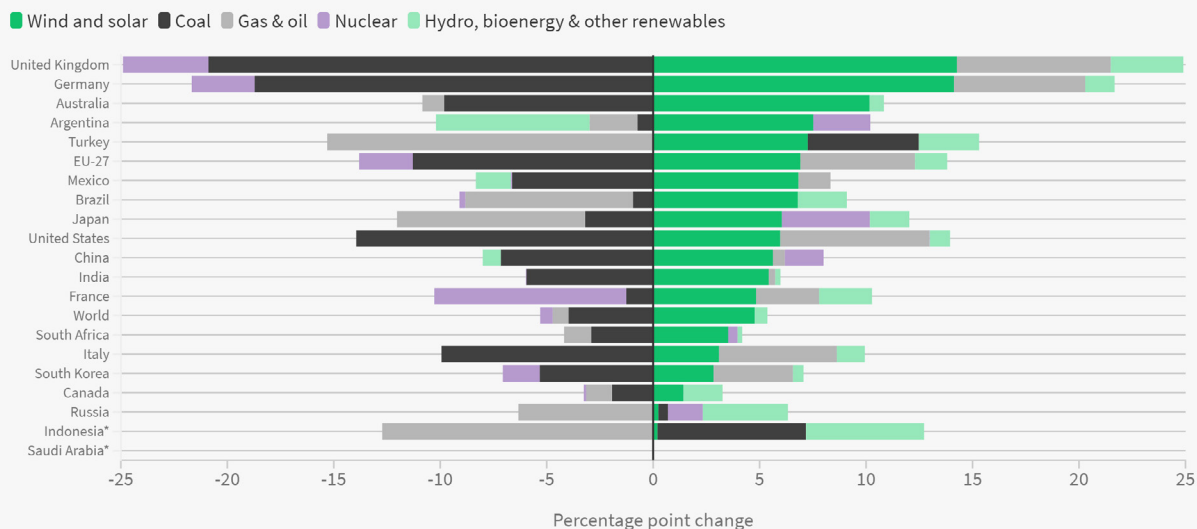
*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists
Ember's Global Electricity Review, March 2021.

Wind and solar account for 29% of the UK's electricity production. This is over three times the global average (9.4%) and places the UK in second place in the G20 just behind Germany with 33%. The proportion of wind and solar in the UK's electricity mix has doubled since 2015.

Wind has made the most progress, delivering a quarter of the UK's electricity for the first time in 2020. This is over four times the global average and the highest in the G20, above Germany. However, year-on-year, UK wind and solar generation only increased 12% compared to a world average of 15%.

The UK leads the G20 for wind and solar pushing out coal

Change in electricity market share between 2015 and 2020, for G20 countries

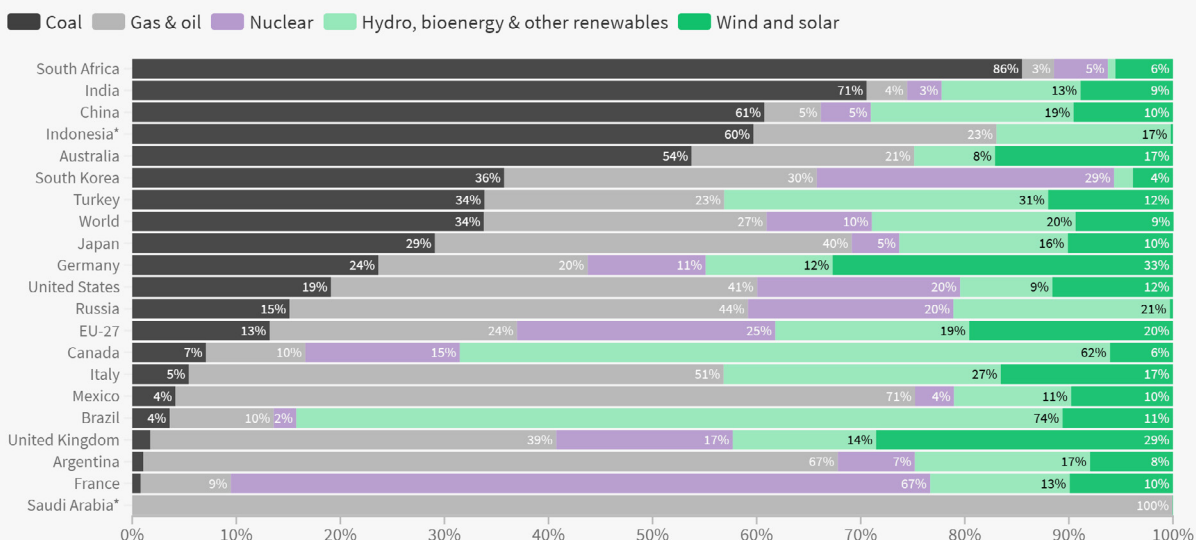


*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists.
Ember's Global Electricity Review, March 2021.

In 2015, the UK announced its intention to stop all unabated coal generation by 2025. Coal then accounted for 22.6% of the electricity mix. By 2020, that had reduced to a mere 1.7%; a considerable decline of 70%. Simultaneously, wind and solar have doubled their share of electricity production over the same period. This has enabled the UK to lead the world in transitioning from coal-fired power generation.

The UK has the fourth lowest percentage of coal in its electricity mix in the G20

Electricity production mix in 2020, for G20 countries



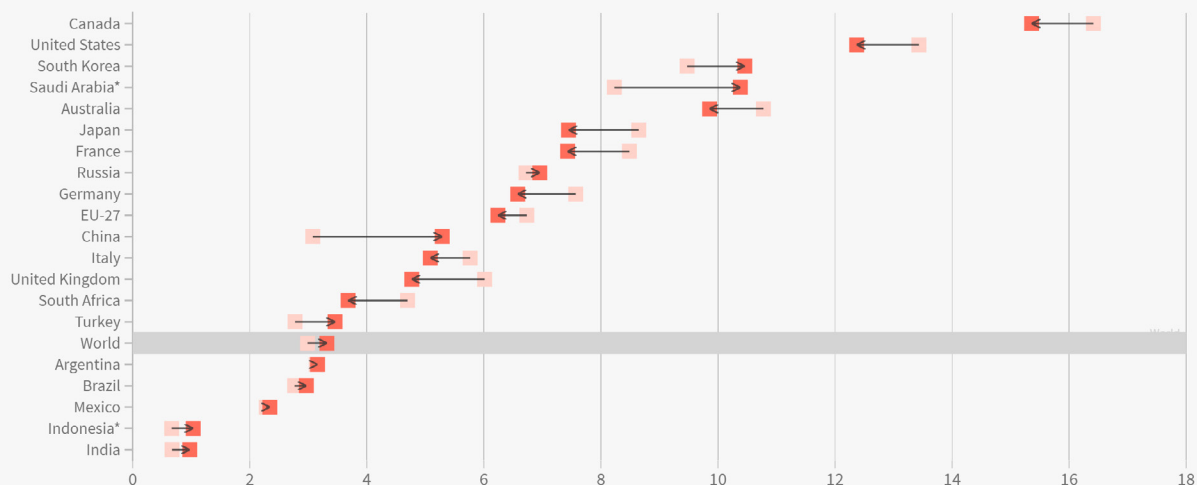
*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists.
Ember's Global Electricity Review, March 2021.

Only France, Argentina and Saudi Arabia produce a smaller share of electricity from coal than the UK. The global average is 33.8% so at 1.7% the UK's reliance on coal is minuscule in comparison. However, the UK is ranked seventh in the G20 for fossil gas generation at 37%, materially above the global average of 23% and just behind the US and Russia. Fossil fuels still provide 41% of the UK's electricity.

The UK has the largest percentage fall in per capita demand in the G20 since 2010

Electricity demand per capita (Megawatt hours), for G20 countries

Year 2010 2020

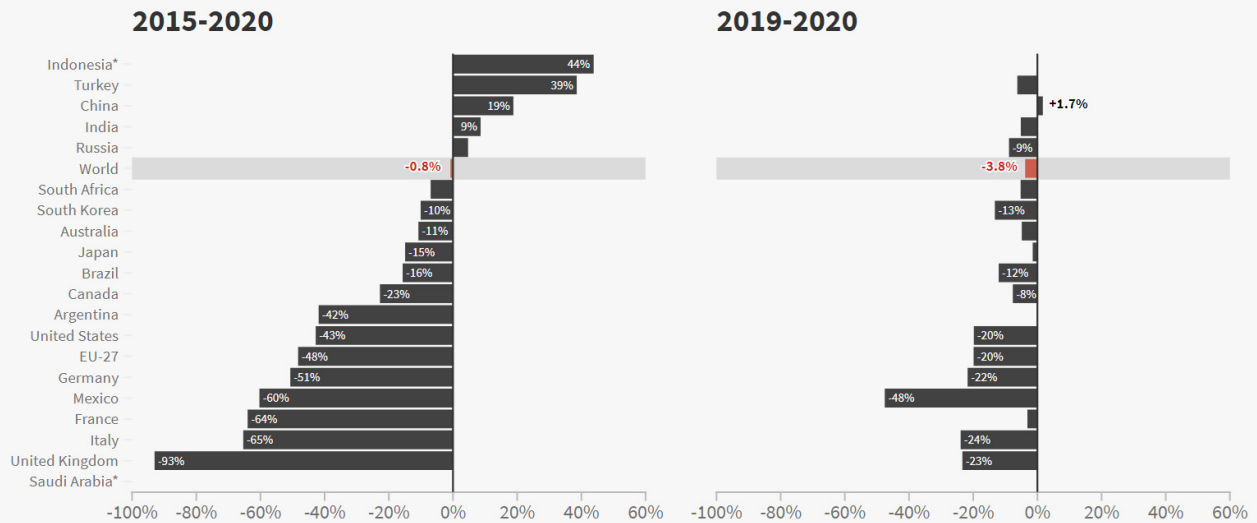


For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists. • Population sourced from United Nations. Ember's Global Electricity Review, March 2021.

The UK's demand per capita remains almost 1.5 times the global average at 4.8 versus 3.3 MWh/capita, but it has fallen by a fifth in the last decade. This is the largest percentage drop of any G20 country and brings the UK's per capita demand below Italy and China. From an absolute perspective, the UK's electricity demand has fallen by 58 TWh (-15%) since 2010. 2020 saw the largest annual fall of 17 TWh (-5.5%) due to Covid-19.

Coal is declining faster in the UK than any other G20 country

Change in coal generation, for G20 countries



*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists.
Ember's Global Electricity Review, March 2021.

The UK has reduced its coal generation by an impressive 93% (-71 TWh) since 2015. This is almost a third more in percentage terms than any other country in the G20. The global decline was a meagre 0.8%. Coal's demise in the UK continued in 2020, falling a further 23%. This was the third highest drop of any G20 country.

Concluding remarks

The UK has a coal phase-out date of October 2024 and a target of net zero emissions by 2050. The UK Climate Change Committee has also recently recommended a plan to make the entire power sector zero-carbon by 2035.

The UK government's [Ten-Point Plan](#) for a Green Industrial Revolution includes an ambitious target of 40 GW of offshore wind generation by 2030. Installed off-shore wind capacity is currently 10 GW, the highest in the world.

With coal generation declining faster than in any other country and the substantial growth in renewable electricity, most notably wind, the UK is on track to hit its coal phase-out target of 2024. Though 37% of generation still comes from fossil gas, the decline has already begun, and an entirely clean power sector by 2035 is now possible.

More information about the Global Electricity Review 2021

Global Electricity Review 2021

www.ember-climate.org/global-electricity-review-2021

Main Report	Global Trends	English	Español 中文
G20 Profiles	Argentina	English	Español
	Australia	English	
	Brazil	English	Português
	Canada	English	
	China	English	中文
	European Union	English	
	France	English	Français
	Germany	English	Deutsch
	India	English	
	Indonesia	English	Bahasa Indonesia
	Italy	English	Italiano
	Japan	English	にほんご
	Mexico	English	Español
	Russia	English	русский
	Saudi Arabia	English	يبرع
	South Africa	English	
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