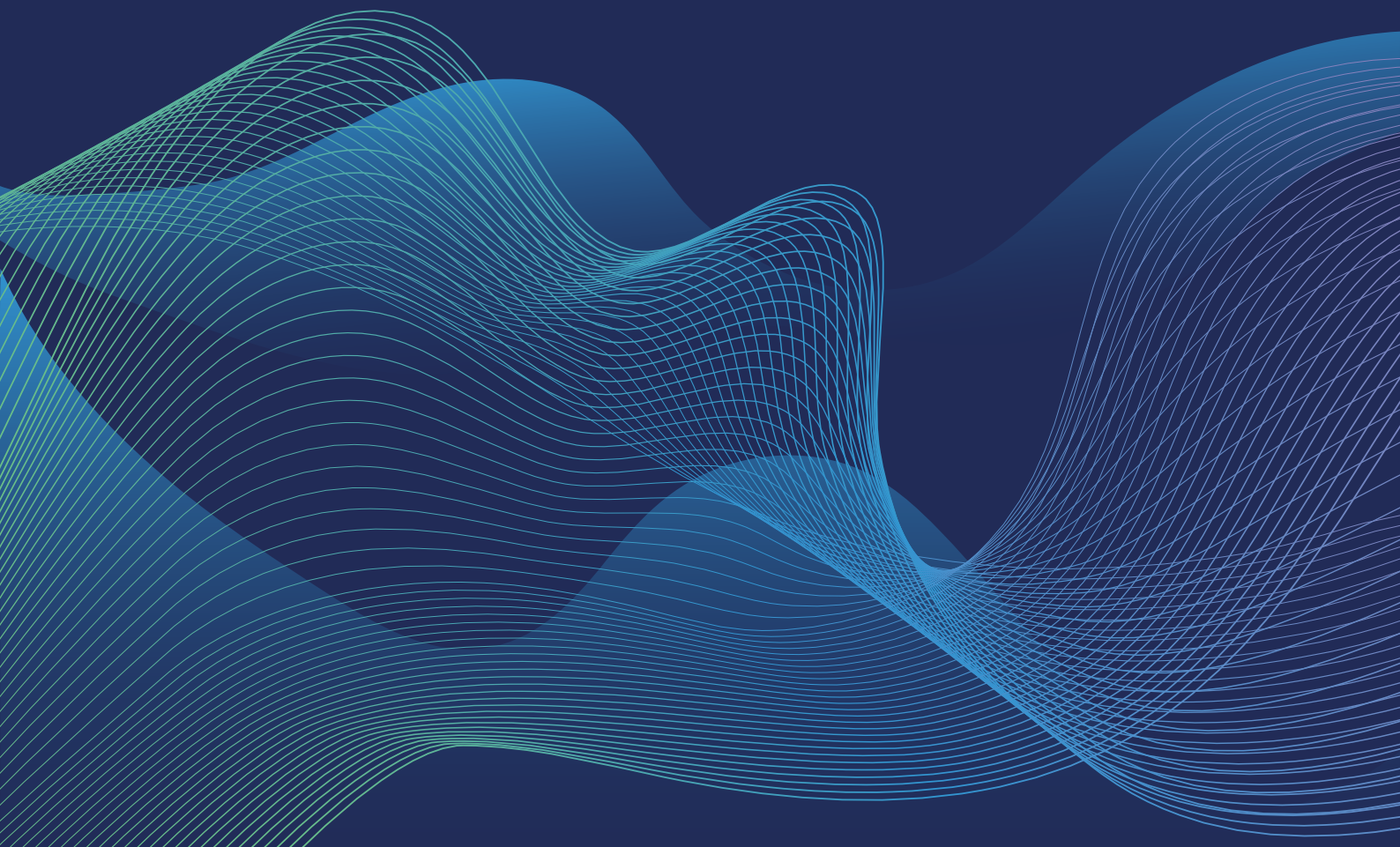
Global Electricity Review 2021
G20 Profile

EMBER
COAL TO CLEAN ENERGY POLICY

FRANCE

France's fossil fuel use is the lowest in the G20

March 2021



Authors Sarah Brown

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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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France’s fossil fuel use is the lowest in the G20

Coal generation has declined by 64% since 2015, but fossil use has actually risen due to an increase in fossil gas.

“Wind and solar beat fossil fuels in France for the first time in 2020, helping France to generate the least amount of electricity from fossil fuels in the G20. France is in an enviable position to potentially have the first fossil-free electricity grid. Demonstrating how to achieve this, through the escalation of wind and solar generation, would create confidence as other larger polluters assess how to go fossil-free.”

Sarah Brown

Senior Electricity Analyst - Europe, Ember

Key findings

1 France generates less electricity from fossil fuels than any other G20 country

Fossil fuels account for 9.5% of production versus the global average of 61%. The UK and Germany have over four times France's levels. However, the proportion of fossil fuels has actually increased from 7.8% of electricity production in 2015 due to fossil gas generation jumping by 62% (+13 TWh).

2 France's drop in coal generation since 2015 is the third largest in the G20

Coal generation in France has declined by 64% since 2015. This places it third in the G20 behind the UK and Italy. However, in absolute terms, it is only a fall of 8 TWh compared to 71 TWh for the UK and 28 TWh for Italy. This is due to France's historic reliance on nuclear rather than coal generation. Coal currently only accounts for 0.8% (4 TWh) of France's electricity production.

3 Wind and solar accounted for 9.9% of France's electricity production in 2020

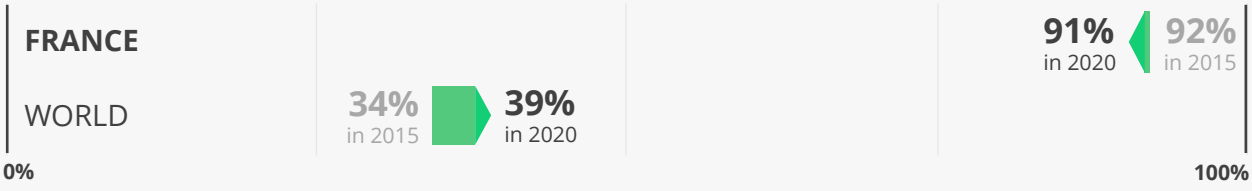
This has doubled since 2015, due to wind generation increasing by 83% (+18 TWh) and solar by 70% (+ 5 TWh) in that period. Despite this significant growth, France has only just edged above the global average of 9.4%.

4 Nuclear generation fell by a staggering 44 TWh (-11%) in 2020

There was a substantial fall in demand of 23 TWh (-4.5%) due to Covid-19. The pandemic also contributed to outages and cancelled maintenance at several nuclear plants. France still has the most nuclear in its electricity mix by some margin at 67% (355 TWh) ahead of South Korea with 29% (153 TWh), but this has decreased from 76% (437 TWh) in 2015.

Progress to 100% clean electricity

Percentage of all renewables & nuclear in total generation



Progress on phasing out coal

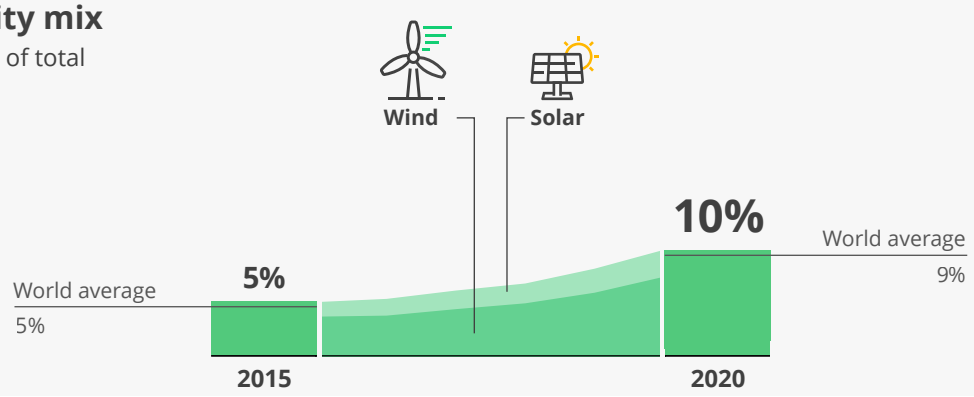
Percentage of coal in total generation

France’s electricity transition in the spotlight: 2015-2020

Share of electricity from wind and solar no better than global average

Wind & solar in electricity mix

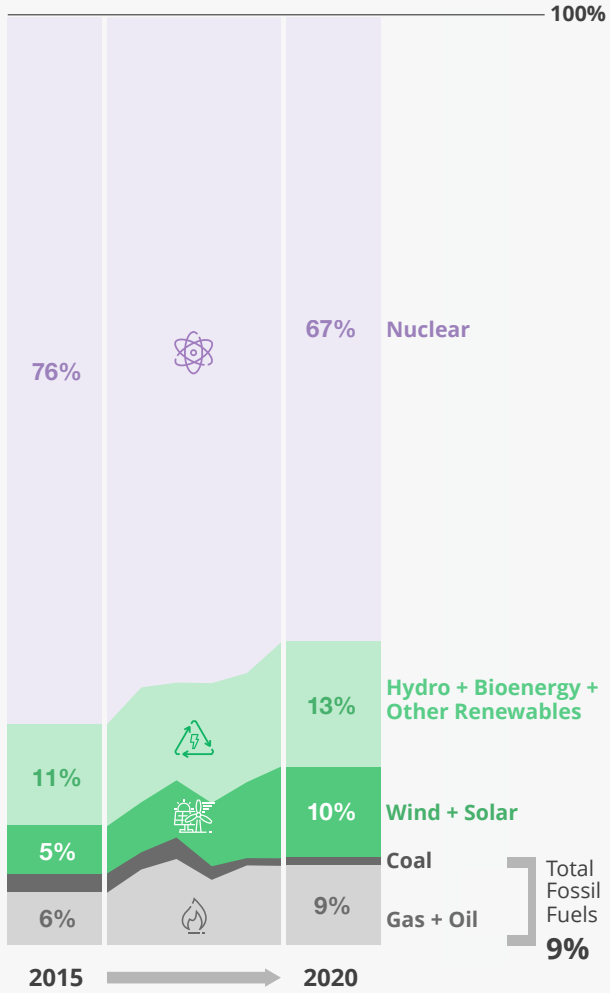
Percentage of total generation



France's electricity mix dominated by nuclear

Electricity mix

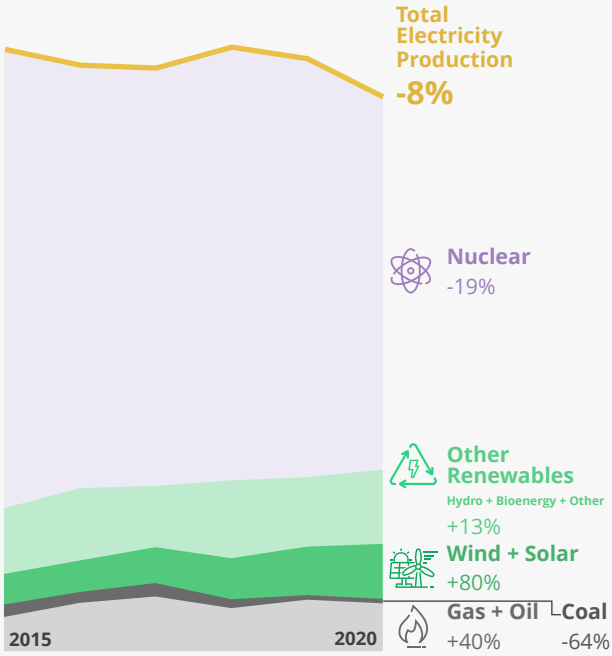
Percentage of total generation



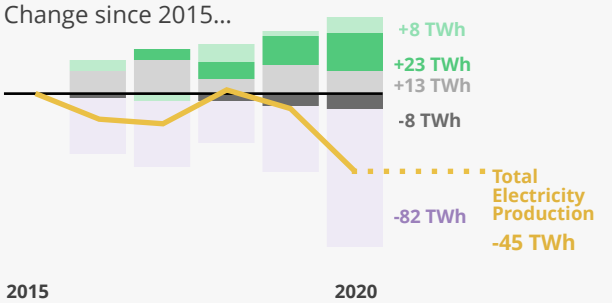
Electricity demand hit hard on pandemic in 2020

Electricity generation

Terawatt hours



Change since 2015...



Wind and solar accounted for 9.9% of production in 2020 and all renewables together accounted for 23% (123 TWh) up from 16% (92 TWh) in 2015. In comparison, fossil fuels had a 9.5% share—the lowest of all G20 countries. Renewable sources have been replacing both coal and nuclear generation between 2015 and 2020, increasing their share by seven percentage points. However, fossil gas has also been on the rise.

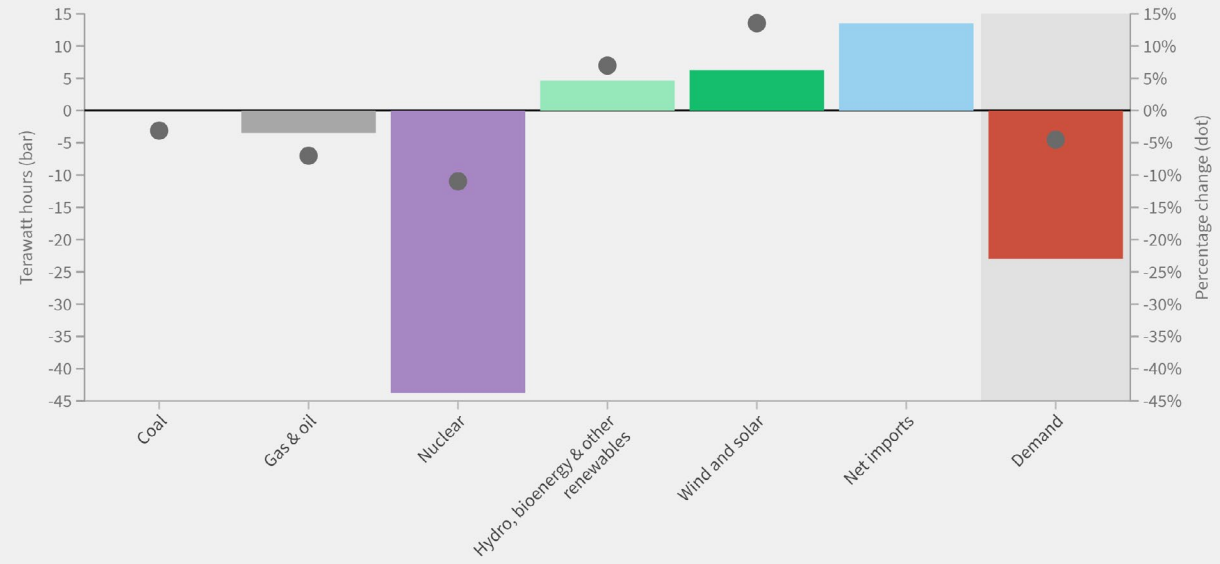
It is wind and solar driving this growth in renewable generation. Specifically wind, with a substantial increase in generation of 83% (+17 TWh) since 2015. Solar has seen a 70% (+5 TWh) gain. Installed wind capacity almost doubled from 10 GW to 18 GW between 2015 and 2020 and solar capacity increased from 7 GW to 11.5 GW over the same period. Hydro electricity gained 12% (+7 TWh). Bioenergy has also gained 25%, but this only represents 2 TWh in absolute terms.

Coal currently accounts for less than 1% (4 TWh) of France's electricity mix, compared to a global average of 34%, and France intends to phase coal out altogether by 2022. Even in 2015, coal's share of production was only 2%. However, fossil fuel generation has increased between 2015 and 2020 despite demand falling (-25 TWh) due to fossil gas production climbing by 62% (+13 TWh).

Nuclear remains the main fuel source with a 67% share (355 TWh), but this has decreased from 76% (437 TWh) since 2015. This drop (-82 TWh) is much greater than the fall in demand of 25 TWh and the deficit has been filled by 31 TWh of renewables, 13 TWh of gas and a decrease in electricity exports of 20 TWh.

France's per capita demand is around double that of the global average and is the seventh highest of all G20 countries. It has fallen 11% since 2010 but still remains above China, Germany and the UK.

What happened in 2020?



France reached a green power milestone in 2020 as wind and solar generation overtook production from fossil fuels for the first time ever. This was predominantly due to an increase in wind generation of 17% (6 TWh) year-on-year, the fifth highest in the G20. Solar and hydro also rose by 5% and 8% respectively. However, only 2.2 GW of new wind and solar capacity was installed in 2020, slightly less than in each of the previous three years.

Renewables were the only fuel source to increase both in relation to share of production and in absolute terms (11 TWh) despite electricity demand falling by 23 TWh (-4.5%). This 4.5% fall in demand was due to Covid-19 and was the third largest in the G20 behind Italy (-6.3%) and the UK (-5%).

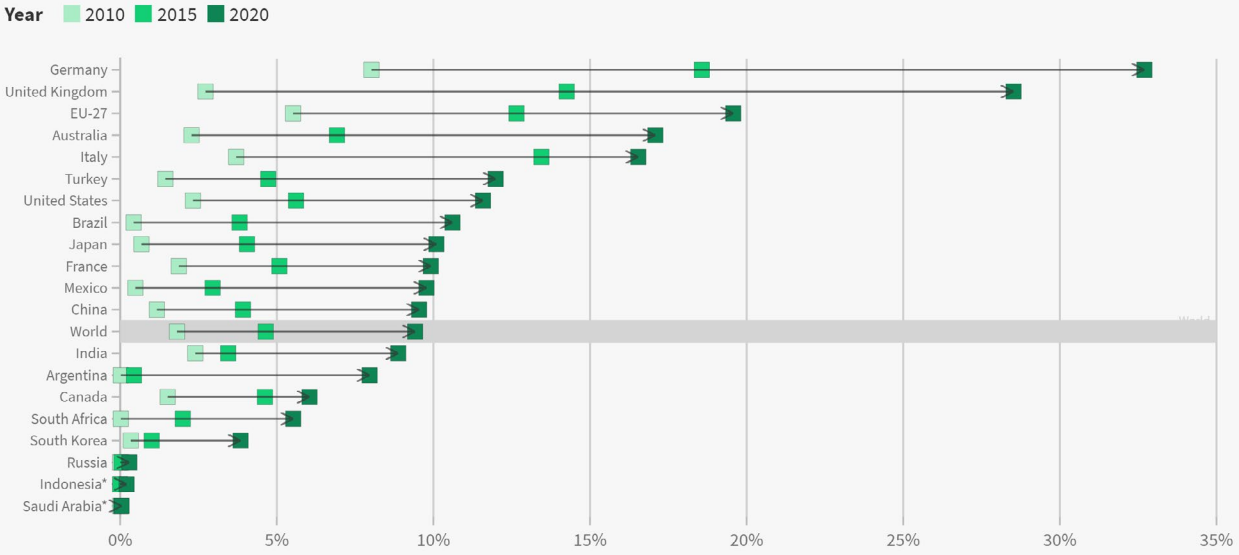
Nuclear generation dropped by 11% (-44 TWh). This was only partially as a result of Covid-19 reducing electricity demand. There were also significant nuclear plant outages. Six plants had 10-year overhauls that were scheduled for 2020. Covid-19 restrictions also caused delays to planned maintenance. In July, EDF updated its output forecast for 2020 to 320 TWh. Historically, annual output has been around 395 TWh. Consequently, France curtailed its electricity exports to Germany, Belgium, Spain and the UK by 14 TWh year-on-year. In September, France actually became a net importer for the first time since 2017.

The Covid-19 related drop in demand did not only affect nuclear but also decreased fossil gas production by 9% (-3 TWh).

France’s transition in comparison with G20 countries

Wind and solar now produce a tenth of France’s electricity

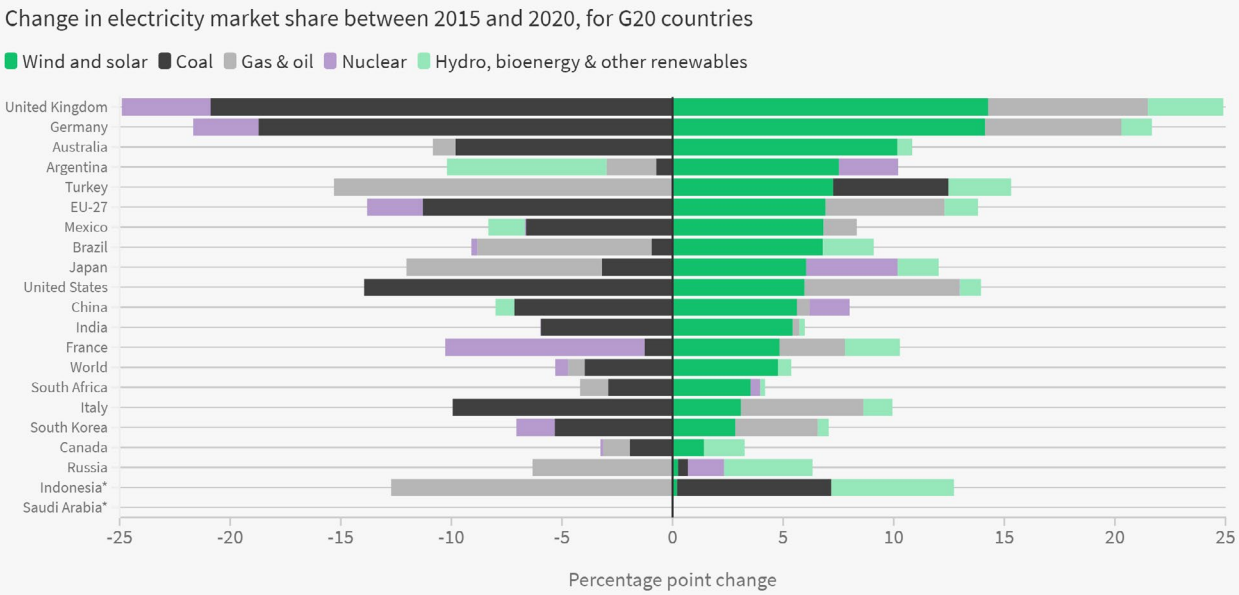
Wind and solar as % share of electricity production for G20 countries



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

Wind and solar have doubled their share of France’s electricity production since 2015 to 9.9%, bringing it just above the global average (9.4%). France had the G20’s fifth highest percentage increase in wind generation in 2020, ahead of the UK, Germany and Italy. However, it is still lagging behind these countries in terms of share of wind and solar in its electricity mix.

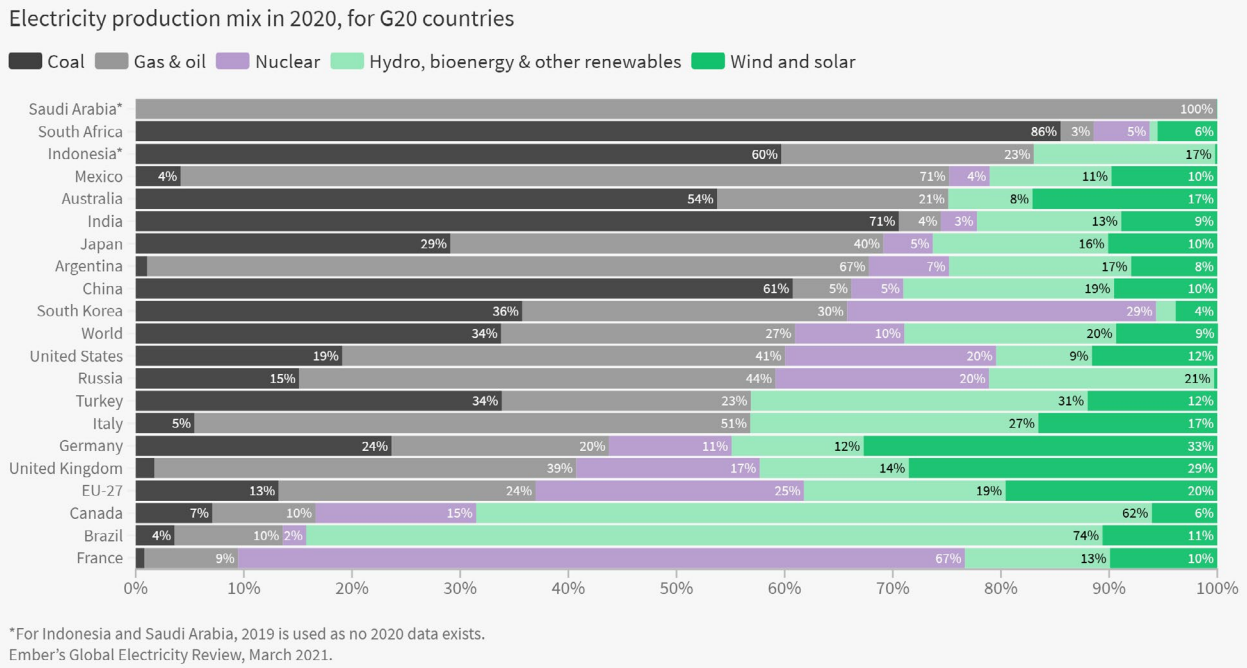
Wind and solar are replacing coal in France



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

In line with the global trend, wind and solar increased their share of electricity generation in France from 2015 to 2020. In fact, it doubled from 5% to 9.9%. However, fossil gas has made similar gains to wind and solar, increasing its share from 4% to 7%.

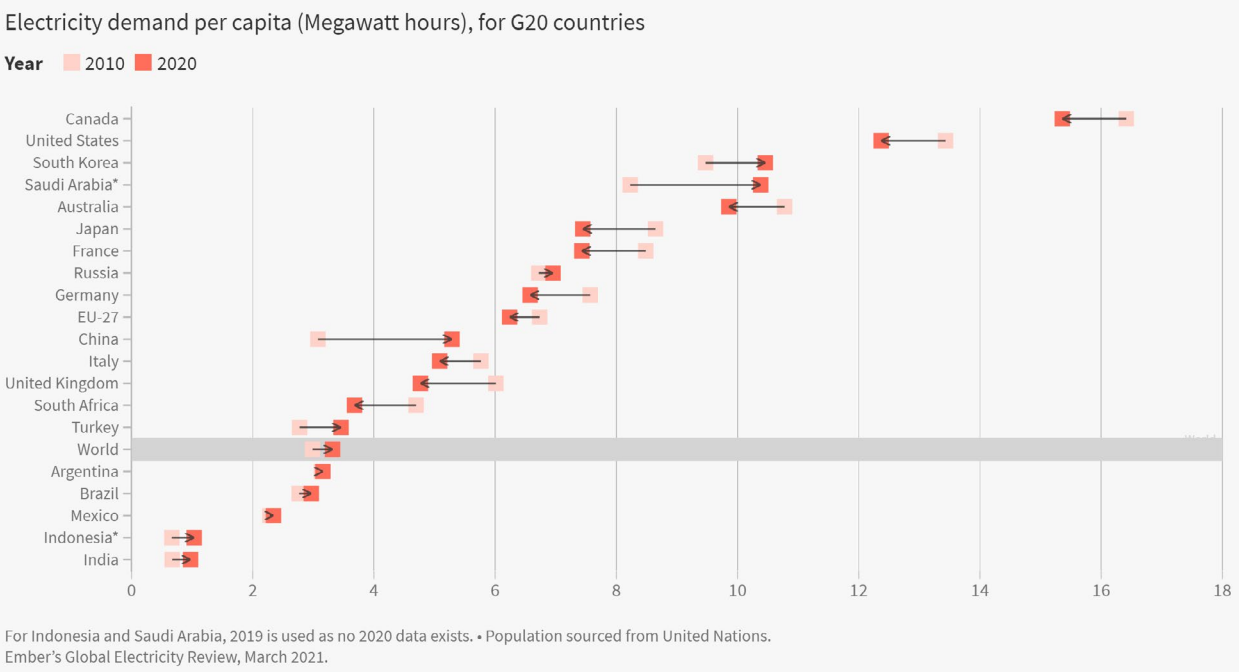
France has the lowest share of fossil fuels in the G20



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

At 10%, France's fossil fuel generation is well below the global average of 61%. This is mostly due to it having the highest nuclear share at 67%. The second highest is South Korea at only 29%. Coal accounts for less than 1% of electricity produced, the lowest in the G20 apart from Saudia Arabia, which has 100% fossil gas and oil. However, France's fossil fuel generation has actually increased from 2015 levels whereas it has fallen in Germany, the UK and the US.

France has the seventh highest electricity demand per capita in the G20, but it is falling

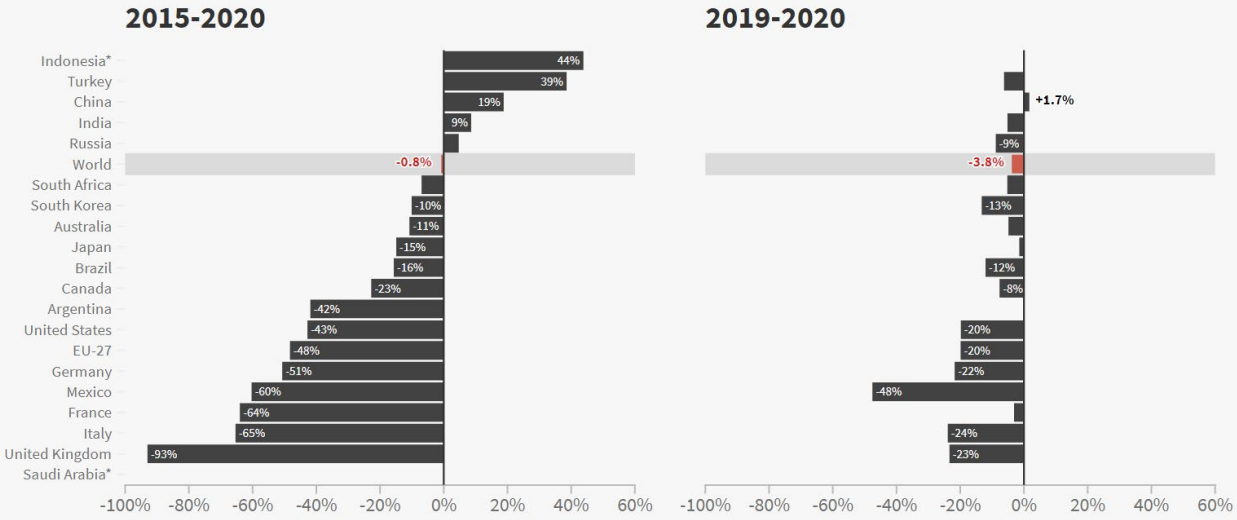


For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists. • Population sourced from United Nations.
Ember's Global Electricity Review, March 2021.

France's electricity demand is more than double the global average at 7.4 MWh/capita and above Italy, Germany and the UK. However, it has fallen (-13%) from 2010 levels at a similar rate to Germany and the UK. In contrast, China and Saudia Arabia have seen rates of demand growth that are more than twice France's rate of decline.

France has the third largest fall in coal generation since 2015

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.

France's coal generation may have decreased by 64% since 2015, but this only equates to 8 TWh due to the minimal role that coal has played in the electricity mix. To put this in context, the 51% drop in Germany is 128 TWh in absolute terms. However, it is still encouraging to see France following the global trend of reducing coal production.

Concluding remarks

France has a coal phase-out date of 2022, one of the most ambitious in the world, which is entirely feasible as less than 3 GW of coal-fired capacity remains operational. France also has a target to reduce greenhouse gas emissions by 40% in 2030 versus 1990 levels. This is below the EU target of a 55% reduction in emissions by 2030 but France currently accounts for less than 1% of global greenhouse gas emissions.

France's National Energy and Climate Plan states that it also intends to cover 40% of its electricity demand from renewables by 2030, with wind energy accounting for half of this. This includes the installation of 35 GW of onshore wind and up to 6 GW of offshore wind.

As nuclear production recovers, hopefully it will replace fossil gas. However, the recovery outlook may not be that bright. EDF has highlighted ongoing nuclear fleet availability issues until at least 2023. It announced an output guidance of 330-360 TWh per annum for the next three years – around 13% below average. Furthermore, France is aiming for a maximum of 50% of nuclear power by 2050 as existing plants are aging and the intention is to not replace them all.

If France does not rapidly escalate investment in wind and solar, this sustained decline in nuclear generation will result in increased fossil gas consumption as electricity demand grows. Consequently, France will not be on track to meet its 2030 renewable energy targets or greenhouse gas emissions reduction targets.

More information about the Global Electricity Review 2021

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G20 Profiles	Argentina	English	Español
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	Saudi Arabia	English	عربي
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