



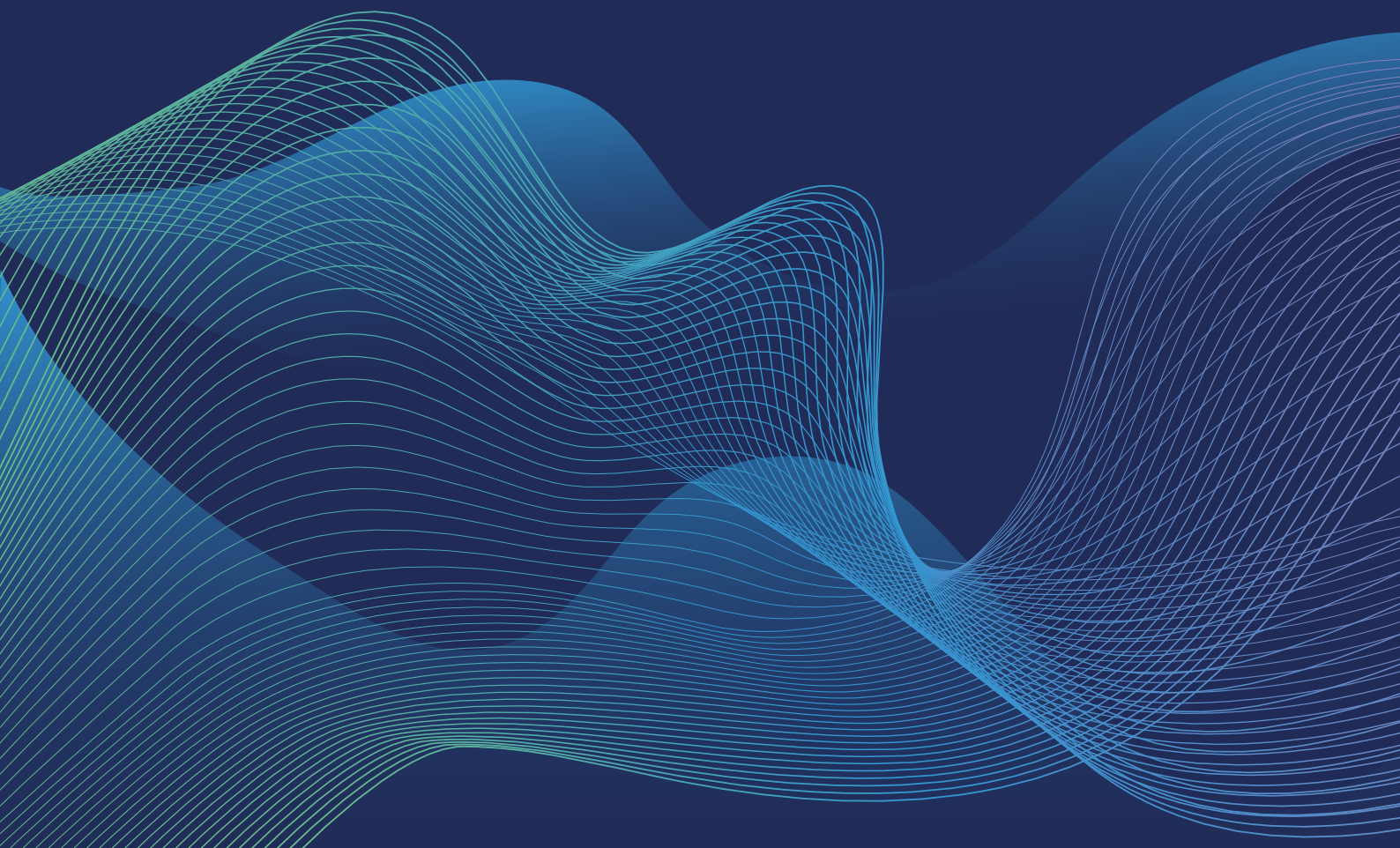
**Global Electricity
Review 2021**
G20 Profile

EMBER
COAL TO CLEAN ENERGY POLICY

EUROPEAN UNION

EU leads on wind and solar electricity
with double the world average share

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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ENERGY POLICY

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EUROPEAN UNION

**EU leads on wind and solar electricity
with double the world average share**

**The EU's electricity transition is giving valuable insights into
how quickly the world can transition to clean electricity**

"Rapid growth in wind and solar has forced coal into decline but this is just the beginning. Europe is relying on wind and solar to ensure not only coal is phased out by 2030, but also to replace closing nuclear power plants, and to meet rising electricity demand from electric cars, heat pumps and electrolyzers. Europe is a hot-bed of innovation in building and integrating huge amounts of intermittent renewable electricity into the electricity grid, which is giving confidence on how the world can transition more rapidly to clean electricity."

Dave Jones

Global Programme Lead, Ember

Key findings

1

Wind and solar grew to generate almost a fifth of the EU's electricity, twice the global average

Wind and solar generation rose robustly in 2020 by 14% in the EU. This meant that wind and solar produced almost a fifth (19.6%) of the EU's electricity last year, up from 13% in 2015. That's twice the world average of 9.4%, and leads amongst all G20 countries: India (9%), China (9.5%), Japan (10%), Brazil (11%), the US (12%) and Turkey (12%). Only the United Kingdom was higher, at 29%. It was as high as 62% in Denmark and 33% in Germany. 2021 is expected to see record amounts of both wind and solar installed in the EU.

2

Europe's coal phase-out steps up

Coal fell by 20% in 2020, and is now almost half (-48%) the level of 2015; one of the fastest falls of any G20 member. Over five years, the fall has helped to reduce the EU's total greenhouse gas emissions by about 7%. However, the impact has been muted, as some of the coal fall has been caused by a rise in gas generation.

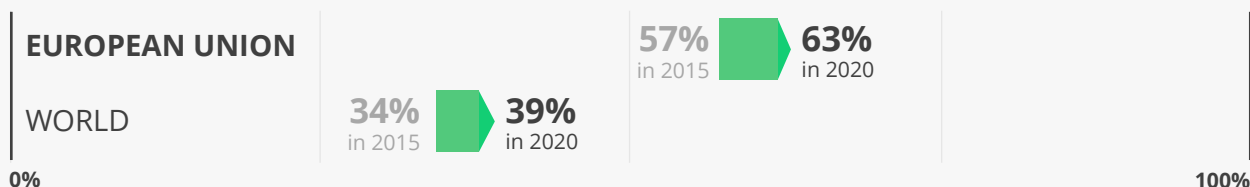
3

Landmark moment as renewables overtakes fossils

Renewables rose to generate 38% of Europe's electricity in 2020 (compared to 35% in 2019), overtaking fossil-fired generation for the first time. Of the G20, only hydro-dependent Brazil and Canada previously had more generation from renewables than from fossil fuels. The rise in renewables was driven by wind and solar, and the fall in fossil fuels was driven by the fall in coal. Gas generation fell by 5% in 2020, but was still 37% higher than in 2015. With that increased level of gas, 37% of Europe's electricity still came from fossil fuels in 2020.

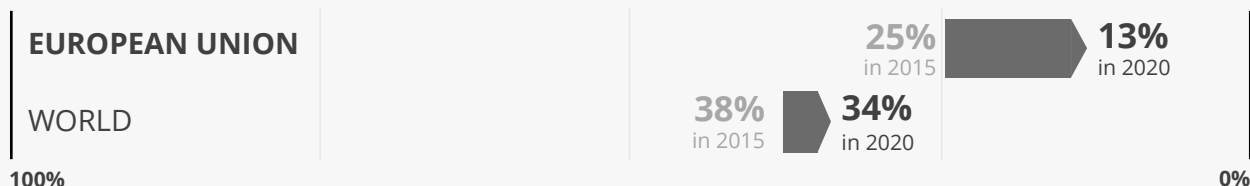
Progress to 100% clean electricity

Percentage of all renewables & nuclear in total generation



Progress on phasing out coal

Percentage of coal in total generation

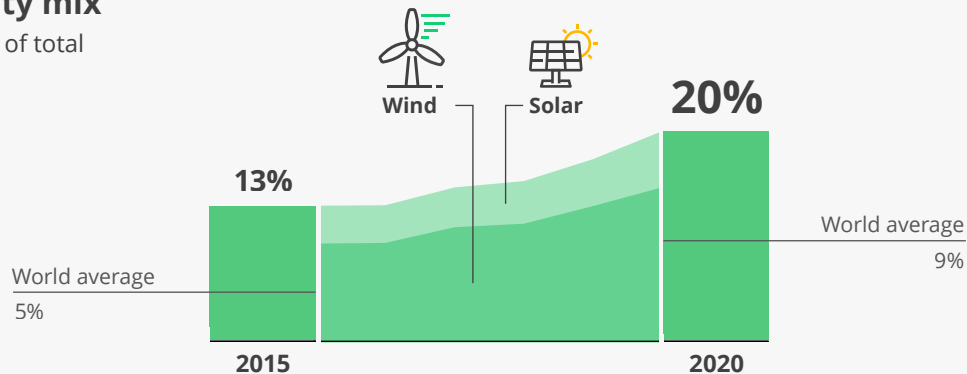


EU's electricity transition in the spotlight: 2015-2020

EU lead the world with double the rate of wind and solar

Wind & solar in electricity mix

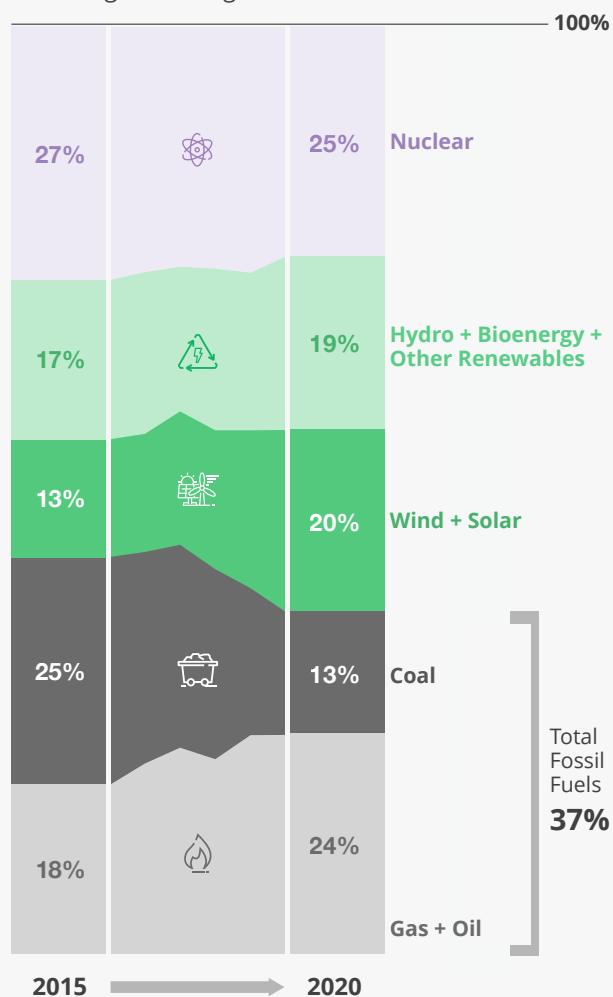
Percentage of total generation



Wind and solar, but also gas, took market share from coal

Electricity mix

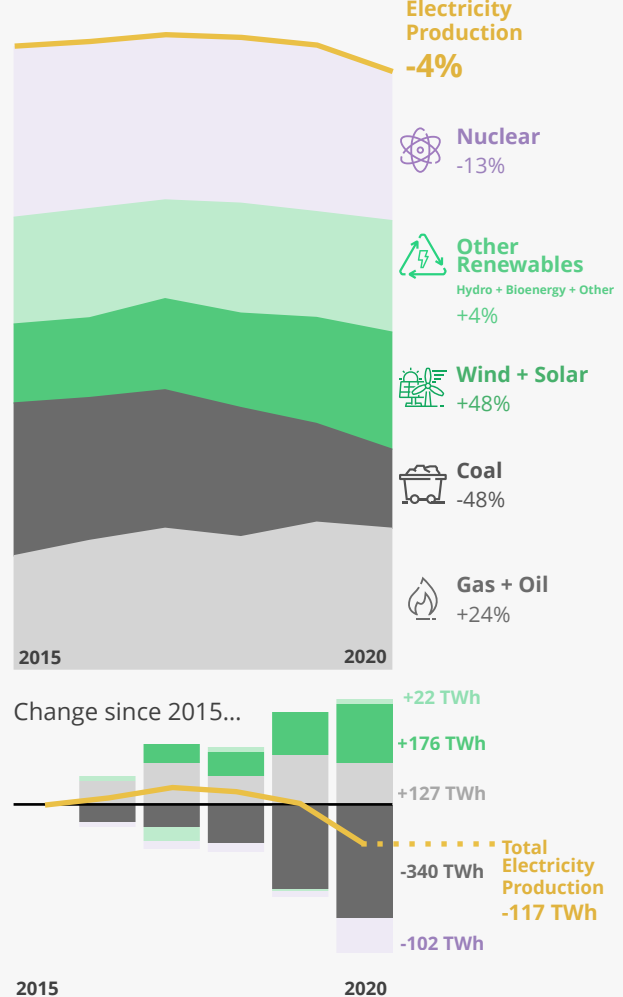
Percentage of total generation



Coal generation almost halved in five years

Electricity generation

Terawatt hours



2020 was a landmark moment, where renewable electricity overtook fossil electricity for the first time in Europe.

Coal has halved in just five years, and around half of that fall was as wind and solar increased. However, coal only fell that fast because gas generation also picked up across the last five years. A country-based analysis of Europe's transition is explained in more detail in Ember's [report](#) "The EU Power Sector in 2020" published in January 2021.

Wind and solar produced a fifth (19.6%) of Europe's electricity in 2020; that's double the global average (9.7%).

Wind and solar have been driving the growth in renewables as other sources stay static: bioenergy growth has slowed to near-zero in the last five years, and there is near-zero new hydro-electricity capacity added. Although wind and solar deployment saw no records in 2020, it's possible that this will change in 2021 as build rate steps up.

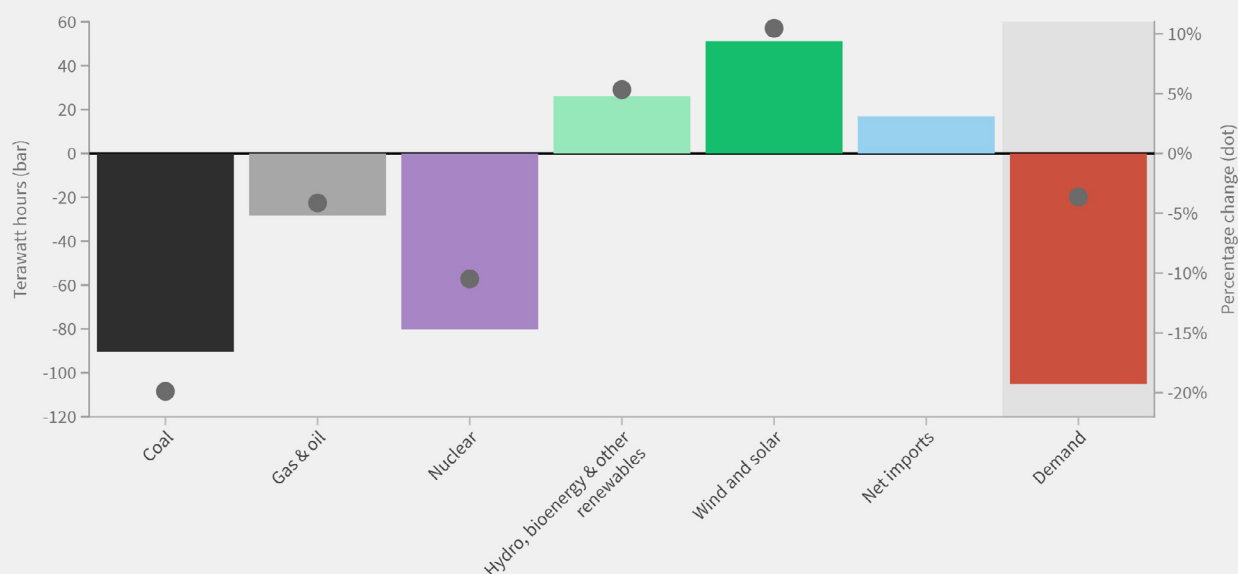
Coal generation is almost half (-48%) the level that it was five years ago.

Coal supplied 13% of Europe's electricity in 2020, down from 25% in 2015. Almost half of Europe's coal plants operational in 2010 have either closed or are due to close. However, 37% of Europe's electricity was still from fossil fuels in 2020. Although gas generation fell slightly in 2020, it is still a large part of the mix. Suppressed electricity demand may have enabled the extent of coal's fall - electricity demand has been mostly flat throughout the last decade.

What happened in 2020?

EU-27 - Electricity changes in 2020 by source

Year-on-year change



Coal fell 20% due to increasing wind and solar and a collapse in electricity demand. In 2020, electricity demand fell by 4% due to the pandemic. Although some countries fell by over 20% at the height of lockdown, by the end of the year electricity demand had broadly recovered to pre-Covid levels. The demand fall was largely offset by the biggest fall in nuclear output in the EU this century, bigger than even the year of Fukushima. In part this was due to permanent plant closures in France, Sweden and Germany, as well as Covid-related problems in France.

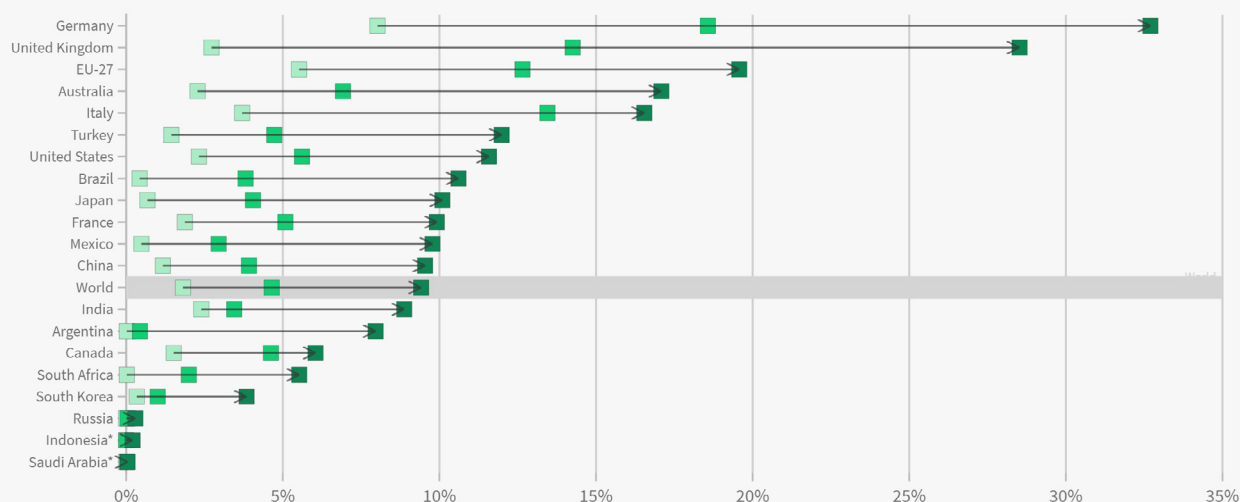
Wind and solar increased by a healthy but unremarkable 14%. Hydro generation also rose on good precipitation; bioenergy was unchanged. All of this culminated in a large fall of 20% in coal generation and a much smaller fall of 5% in gas generation.

EU's transition in comparison with G20 countries

EU leads the G20 on wind and solar

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

Year 2010 2015 2020

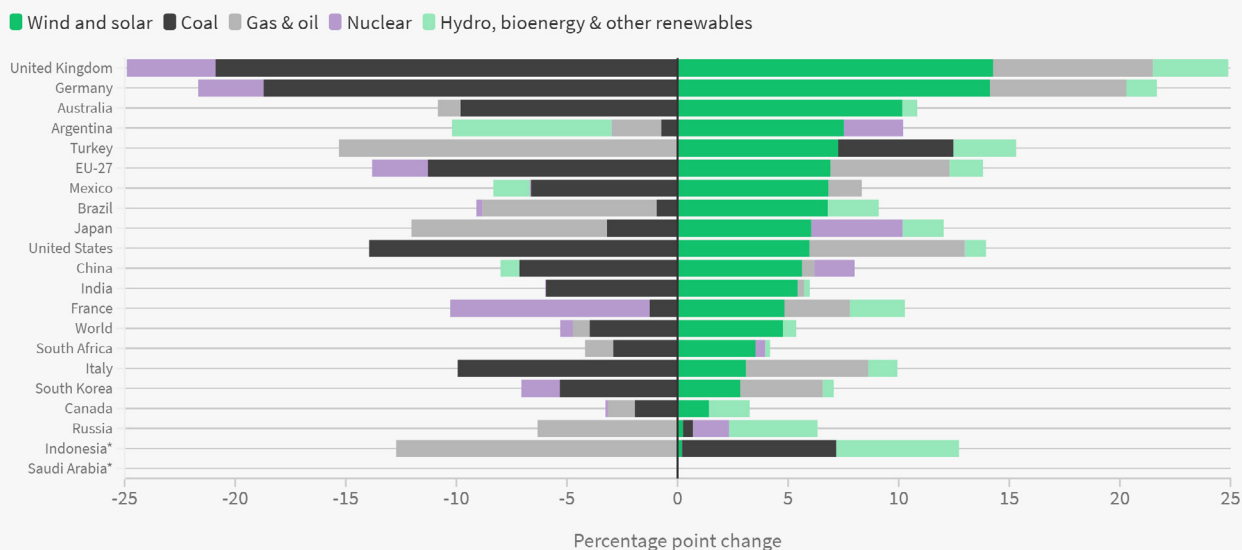


*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists
Ember's Global Electricity Review, March 2021.

The EU is leading the world in building up wind and solar, with twice the world average. As the world reaches almost a tenth of its electricity from wind and solar, the EU is almost at 20%. Germany is head and shoulders above the rest of the G20 with 33%. Current targets in the EU mean tripling the rate of wind and solar growth in the 2020's, which means that the EU is likely to keep its top spot even as countries step up in the coming years.

Wind and solar, but also gas, is replacing coal in the EU

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

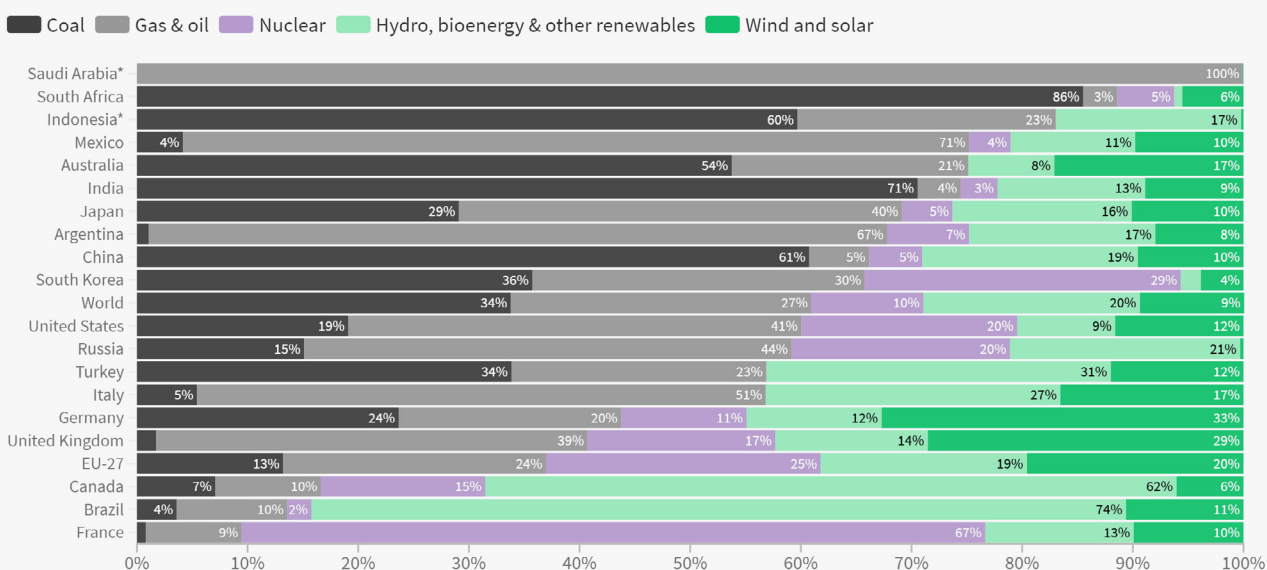


*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists.
Ember's Global Electricity Review, March 2021.

Since 2015, the market share of wind and solar has risen by 7 percentage points from 13% to 20% of electricity supply. That has led to a collapse in coal by 11 percentage points, as gas generation also contributed to some of the fall in coal. Wind and solar taking market share from coal is happening across the G20, but in most cases it's not leading to an increase in market share of gas.

EU renewables beats fossil, but still has a way to 100% clean electricity

Electricity production mix in 2020, for G20 countries



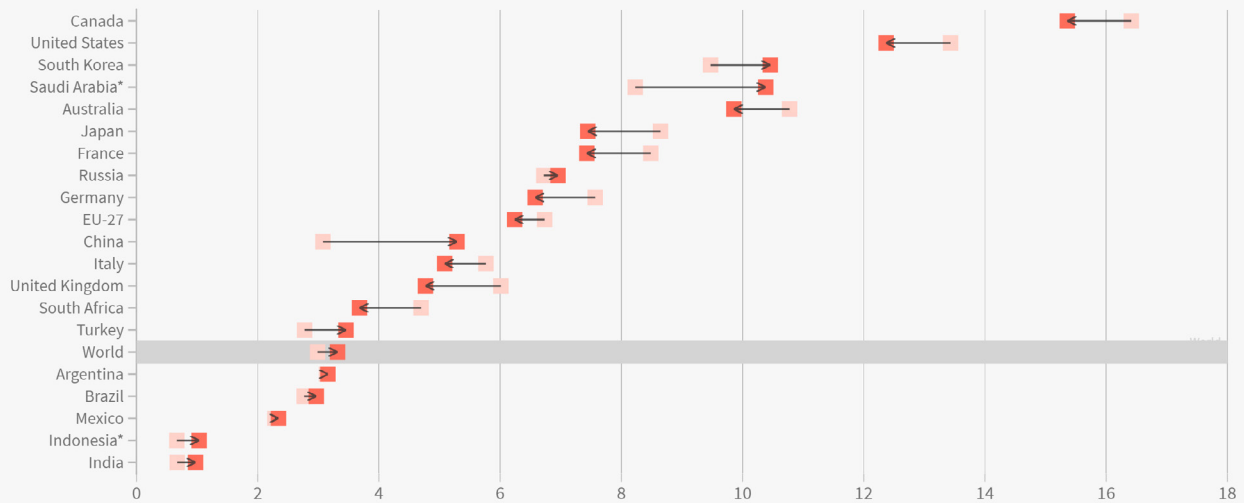
*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists.
Ember's Global Electricity Review, March 2021.

Total renewables generation (38%) surpassed fossil generation (37%) for the first time in 2020.

EU's electricity demand is lower than a decade ago

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

Year 2010 2020

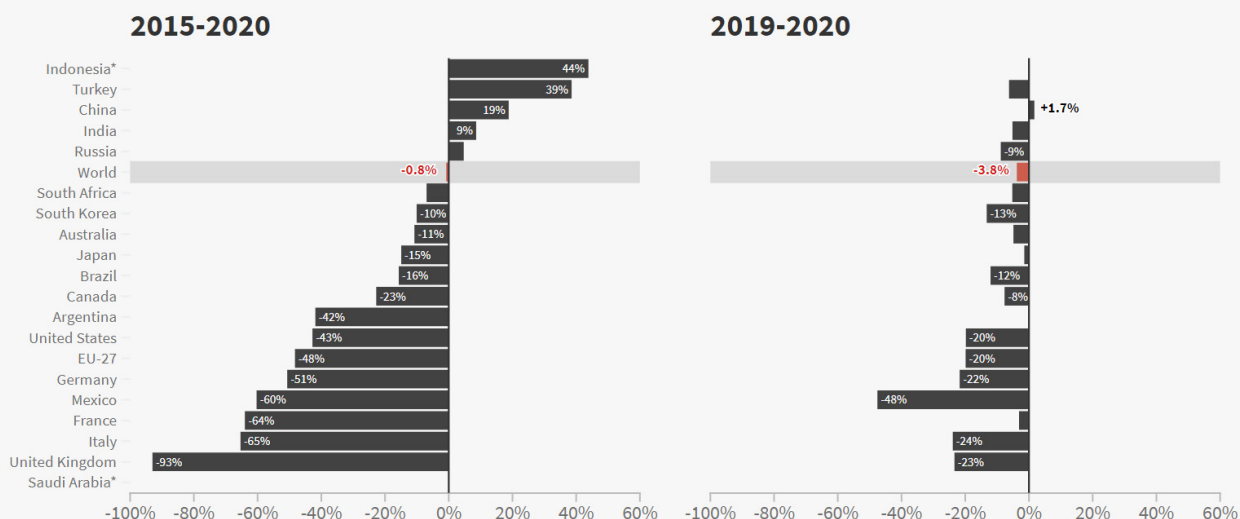


For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists. • Population sourced from United Nations. Ember's Global Electricity Review, March 2021.

EU electricity demand was 4% lower in 2020 than in 2010. The US, Canada and Australia all saw falls, whilst other parts of the world, especially in Asia, rose substantially. The EU's demand per capita at 6.2 MWh is still above China's (5.3 MWh), although China's has been rising at a very fast rate, now overtaking Italy and the UK.

The EU halved coal generation in the last 5 years

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.

In 2020, coal fell by 20% in the EU. This was driven by growth in wind and solar alongside falling electricity demand due to the pandemic—a pattern mirrored elsewhere. But looking back to 2015, coal generation in the EU has fallen a lot more than other countries. The EU's coal generation was 48% lower in 2020 than in 2015, exceeding even the US's 43% fall.

Concluding remarks

The EU's electricity transition is world-leading. A substantial pick-up in wind and solar electricity has helped, in part, to collapse coal generation in half. Europe's innovations in building and integrating huge amounts of intermittent renewable electricity into the electricity grid can give lessons and confidence to other countries on how to transition more rapidly to clean electricity.

But the journey has just begun. Wind and solar are a fifth of electricity supplied in Europe, but this will need to approximately triple in the next decade.

That level of growth is needed to meet new electricity demand and help complete the phase-out of coal. However, even if the EU hits renewables targets, gas generation is unlikely to shrink much as long as the EU still lacks a phase-out plan.

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	
	South Korea	English	한국어
	Turkey	English	Türk
	United Kingdom	English	
	United States	English	

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