



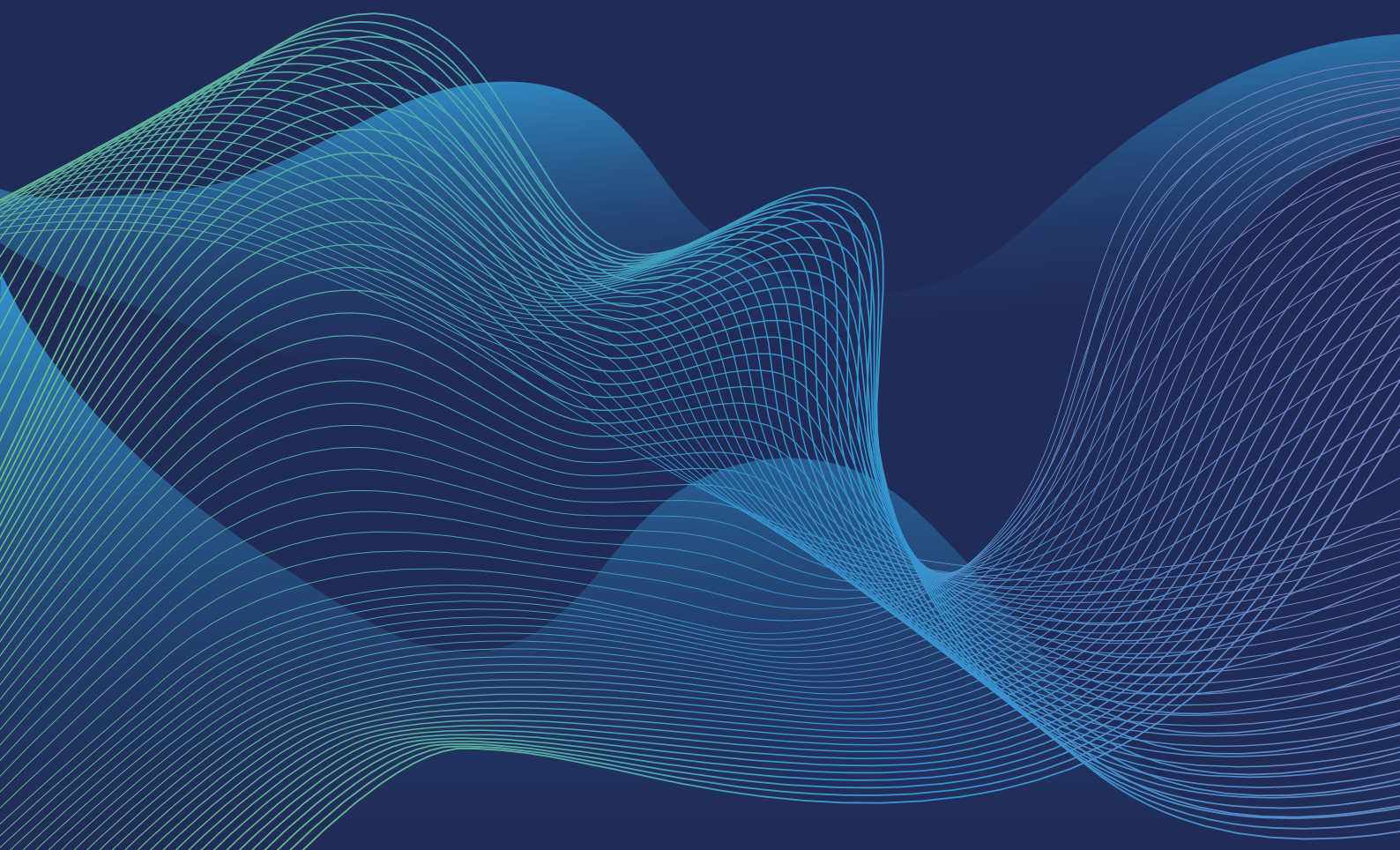
**Global Electricity
Review 2021**
G20 Profile

EMBER
COAL TO CLEAN ENERGY POLICY

RUSSIA

Russia sticks with fossil fuels, as G20
switches to clean power

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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RUSSIA

Russia sticks with fossil fuels, as G20 switches to clean power

A step change in renewable capacity growth is needed to drive coal and gas out of the electricity mix

"While other G20 members are in a race to decarbonise their electricity grids with wind and solar, Russia has yet to begin. Large hydro and nuclear capacity put it at a favourable starting point, and although small increases in these have kept pace with the growth in electricity demand so far this century, Russia has made no signal yet that it will rapidly increase clean electricity investment to cut its fossil reliance. Long-term commitments to phase out coal and close inefficient gas plants are needed."

Euan Graham

Electricity Tracking Analyst, Ember

Key findings

1 In 2020, fossil generation fell by 9% due to two temporary factors

First, a 2.4% decrease in electricity demand due to Covid-19; second, a large increase in hydro generation due to record meltwater.

2 Russia's share of fossil generation remains high at 59%

It is just below the world average of 61%, with sizable hydro and nuclear capacity meeting the remaining share of electricity production.

3 Wind and solar generate almost none of Russia's electricity

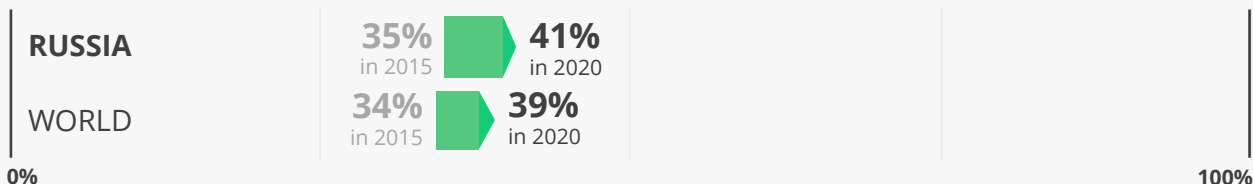
In 2020, just 0.3% of Russia's electricity came from wind and solar, far below the world average of 9.4%.

4 There has been very little structural change to Russia's electricity system over the last five years

Growth in wind and solar capacity has been extremely limited; most changes to Russia's electricity mix have been driven by weather-related factors.

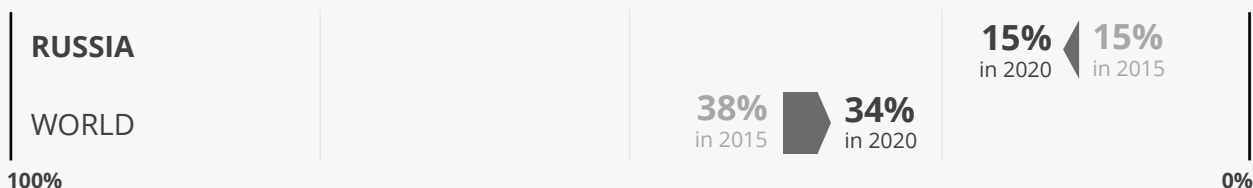
Progress to 100% clean electricity

Percentage of all renewables & nuclear in total generation



Progress on phasing out coal

Percentage of coal in total generation

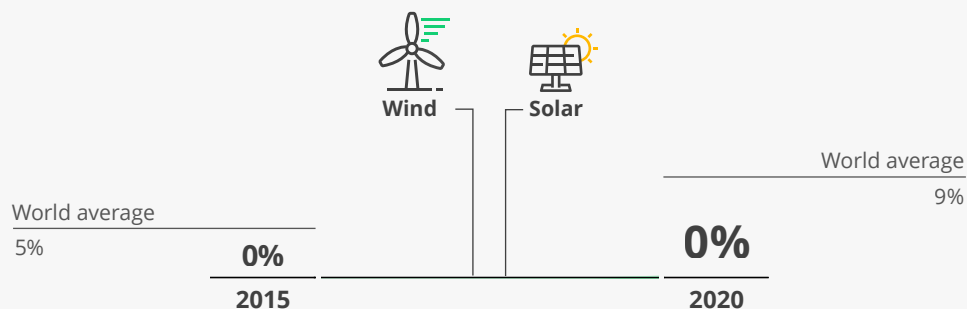


Russia's electricity transition in the spotlight: 2015-2020

Wind and solar generate almost none of Russia's electricity

Wind & solar in electricity mix

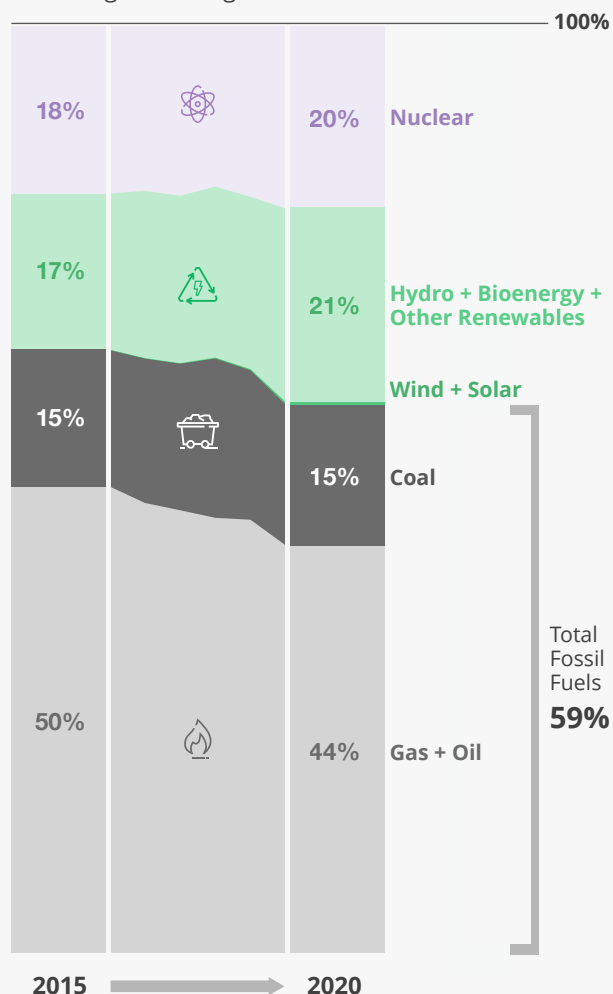
Percentage of total generation



Fossil fuels are still 59% of Russia's electricity

Electricity mix

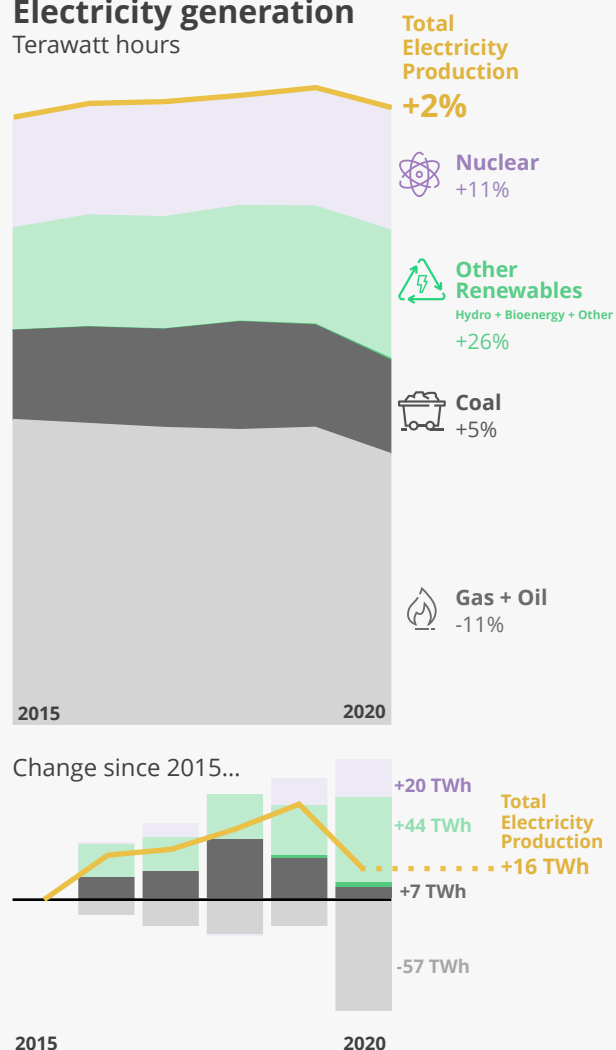
Percentage of total generation



Rising electricity demand means coal generation has increased since 2015

Electricity generation

Terawatt hours



Russia's share of fossil generation remains high at 59%. This marks a 6% fall in market share since 2015. However, this fall in fossil generation does not indicate that a clean energy transition is underway: favourable weather conditions over the last two years led to large increases in hydro generation.

Russia's share of renewable electricity stands at 21%—consisting almost entirely of hydro generation (20%).

Wind and solar barely feature in Russia's electricity system, making up just 0.3% of electricity production in 2020, compared with the world average of 9.4%. While hydro is responsible for the 4 percentage point increase in Russia's renewables share since 2015, this has been driven by anomalous weather conditions rather than any significant increase in capacity. Last year showed some small promising signs of an uptick in wind and solar, with record capacity additions for both technologies. However, this growth is from a low starting point, and consistent acceleration is needed to catch up with the global renewables expansion.

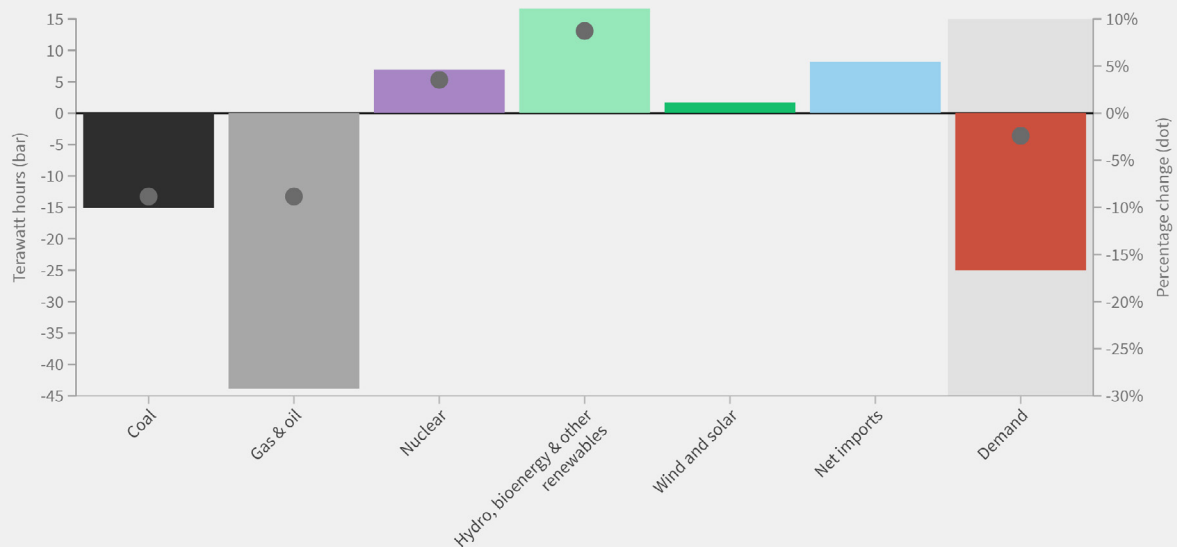
Fossil generation in Russia is dominated by gas, making up 43% of total electricity production, while 15% comes from coal.

Russia's gas is more polluting than most: [Karryos](#) estimate that fugitive methane emissions—caused in part by extracting gas to power Russia's gas power plants—increased by 32% in the last year alone. Until 2020, the share of Russia's electricity coming from fossil fuels had remained largely constant over the last decade, as gas generation fell slightly while coal increased. In fact, in 2019 fossil generation made up 63% of Russia's electricity, down only two percentage points from 65% in 2015. But by 2020 fossil generation was squeezed down to 59% of electricity generation as demand fell and hydro and nuclear generation increased. Electricity demand has grown slowly over the last few years, met by about 10 GW of new fossil capacity, and 10 GW of hydro and nuclear.

What happened in 2020?

Russia - Electricity changes in 2020 by source

Year-on-year change



Fossil generation decreased by 8.8% (-59 TWh) in 2020, driven by two main factors: a Covid-induced fall in electricity demand, and a record year for hydro generation. Electricity demand fell 2.4% (-25 TWh), by far the largest fall seen since the recession of 2009. Meanwhile hydro generation increased by 9% (+17 TWh), [driven by weather-related factors](#).

In January and February, temperatures were around 5 degrees above the historical average, leading to increased meltwater and large hydro output throughout the first half of 2020. Wind and solar generation showed small increases as new capacity was brought online (0.8 GW and 0.4 GW respectively), while nuclear generation also saw an increase of 3.5% (7 TWh).*

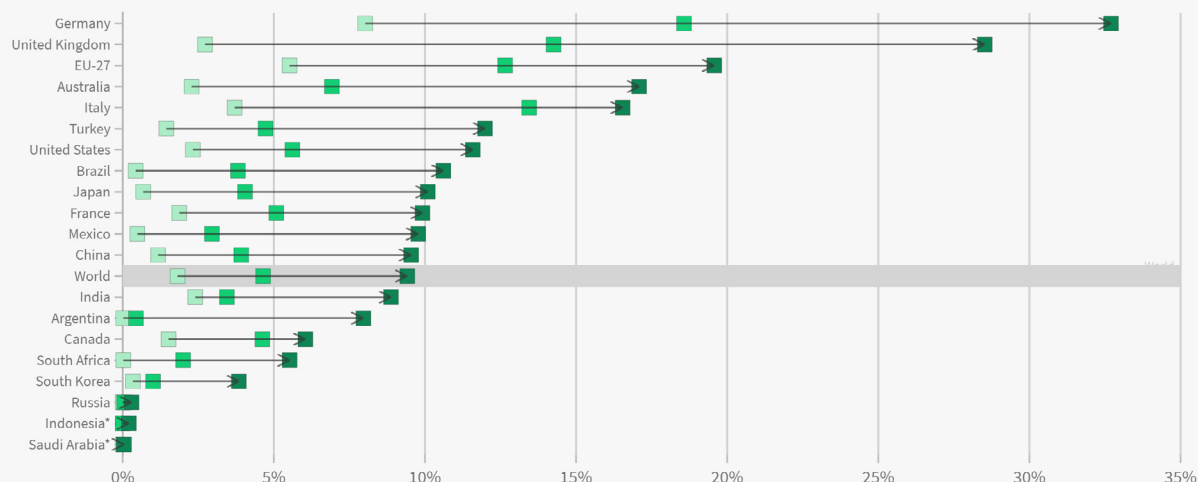
* Fossil generation for Russia in 2020 is not broken down by fuel type, so it is assumed that the same percentage fall is seen across all fossil fuel types.

Russia's transition in comparison with G20 countries

Russia has barely increased its share of wind and solar power

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

Year 2010 2015 2020

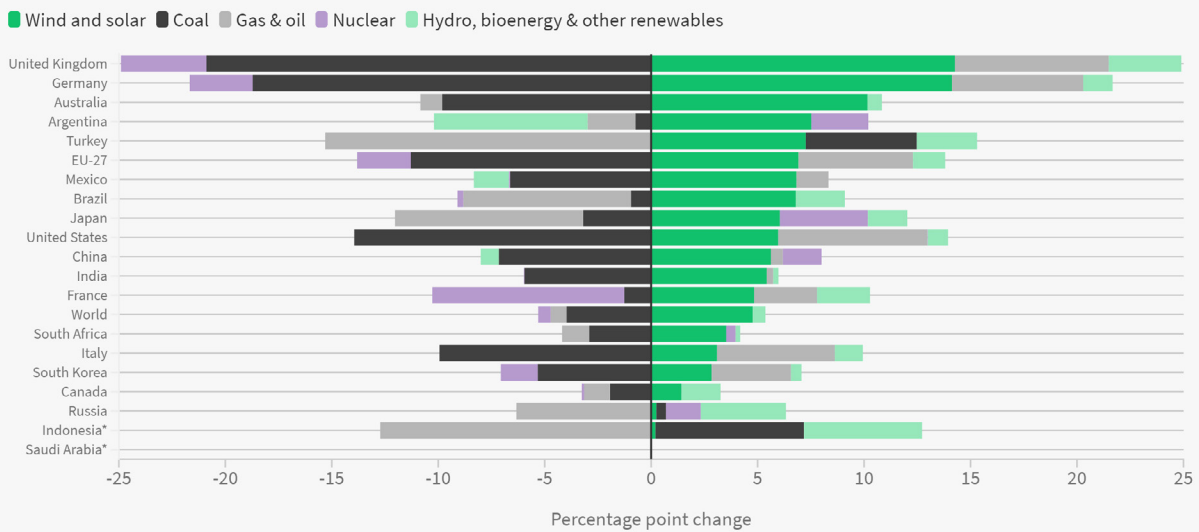


*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists
Ember's Global Electricity Review, March 2021.

Whilst other G20 countries are radically transforming their electricity system with wind and solar, Russia stands out as one of three G20 members who have made little to no progress in the last decade. In fact, most G20 members generated more electricity using wind and solar in 2010 than Russia did in 2020. And while almost a tenth of global electricity came from wind and solar in 2020, just 0.3% of Russia's electricity came from these cheap and renewable sources. Argentina is an example of what's possible in a short space of time, increasing its share of renewables from 0.4% to 8% in the last five years alone. This highlights both the potential for Russia to transform its electricity mix with wind and solar, and the risk of the Russian power sector being left behind as other G20 members decarbonise their grids with cheap new technologies.

One-off hydro conditions allowed gas to fall in 2020, while coal has risen since 2015

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

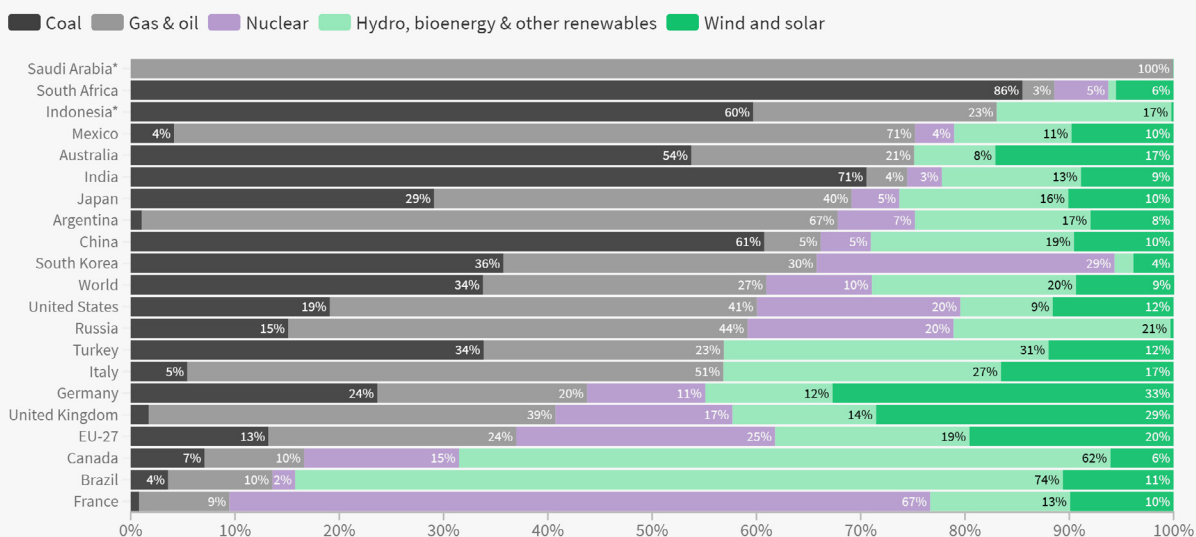


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Ember's Global Electricity Review, March 2021.

Limited growth in wind and solar generation has muted potential declines in fossil generation, allowing coal's share of production to slightly rise in the last five years, while other G20 members have seen large falls. And while gas generation has fallen in Russia's electricity mix, the main driver of this has been weather-related increases in hydro generation. This means that structural changes in Russia's electricity mix are small when compared to other G20 members. For example, the United Kingdom has added more than 10 GW of new wind power since 2015, which increased total wind capacity by 70%, and helped to knock coal out of the electricity mix in the process. In contrast, Russia's hydro capacity increased by just 0.3 GW from 2015 to 2019, an increase of less than 1%.

Russia's electricity has a similar fossil dependency as in the United States

Electricity production mix in 2020, for G20 countries



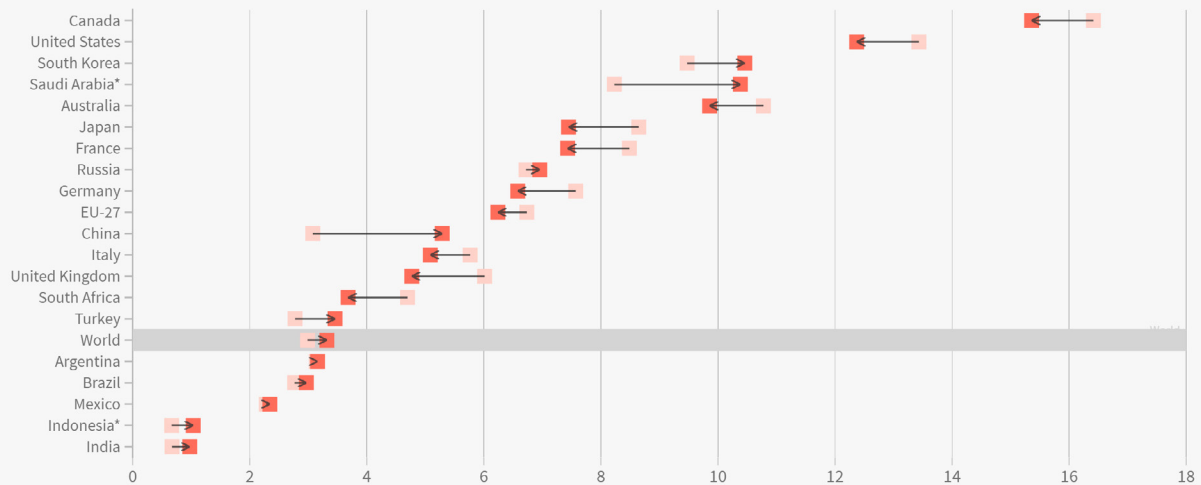
*For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists.
Ember's Global Electricity Review, March 2021.

Russia has historically had large hydro and nuclear capacity meaning that less of its electricity comes from fossil fuels than other G20 members. Notably, Russia produced a similar amount of its electricity from fossil fuels in 2020 as the United States, and sits just below the world average of 61%. President Biden's administration is pushing for a commitment for the United States to switch its electricity system to 100% clean electricity, in just 14 years from now.

Russia's electricity demand per capita overtakes the EU-27

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

Year 2010 2020

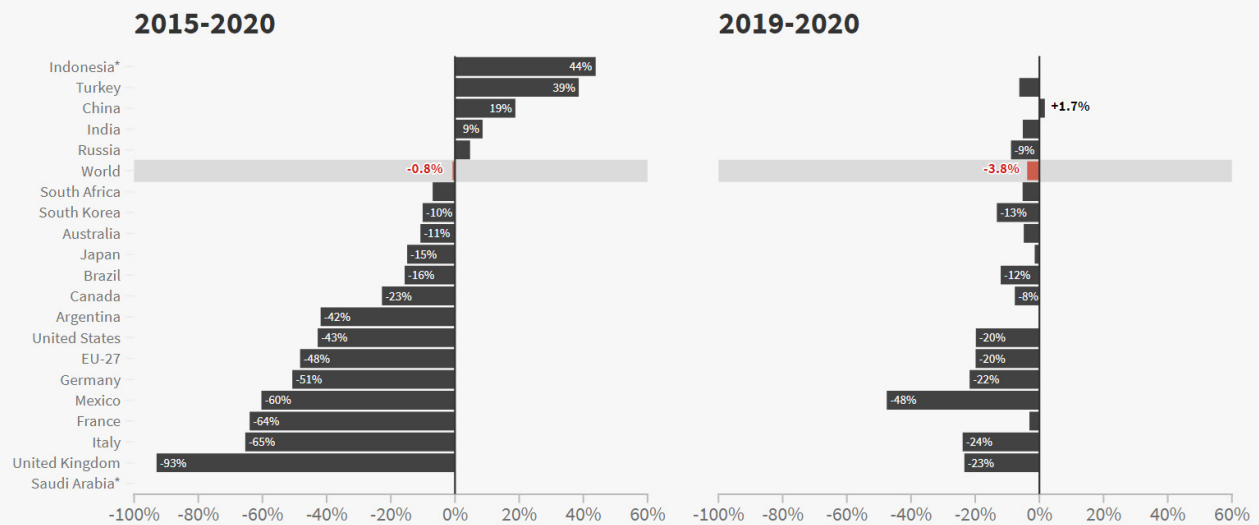


For Indonesia and Saudi Arabia, 2019 is used as no 2020 data exists. * Population sourced from United Nations. Ember's Global Electricity Review, March 2021.

Russian electricity demand per capita has slowly increased over the last decade and is now higher than that of the EU-27. While heavily subsidised gas production combined with regulated electricity prices have distorted the economic case for energy efficiency in Russia, other European neighbours have used energy efficiency to decouple economic growth from electricity demand.

Russia is one of only five G20 countries where coal generation has increased 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.

This increasing electricity demand and a lack of build-up in renewables has meant that Russia is one of only five G20 members to increase its share of coal generation in the last five years.

Concluding remarks

Russia's updated NDC outlines a target of at least a 30% reduction in emissions from 1990 levels by 2030. But Russia had already met this target by 1993 as industrial production and electricity consumption fell drastically following the break-up of the Soviet Union. In fact, the country's emissions could increase significantly over the next decade whilst still meeting the target.

To kick-start an electricity transition, Russia must start seeing wind and solar as contributors towards maintaining their energy security in an increasingly decarbonised world. The government must set out genuinely ambitious long-term goals, accompanied by a step change in the building of clean technologies. Until then, the electricity transition cannot begin, and Russia risks being left behind as other G20 members decarbonise their electricity grids.

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
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	United Kingdom	English	
	United States	English	

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