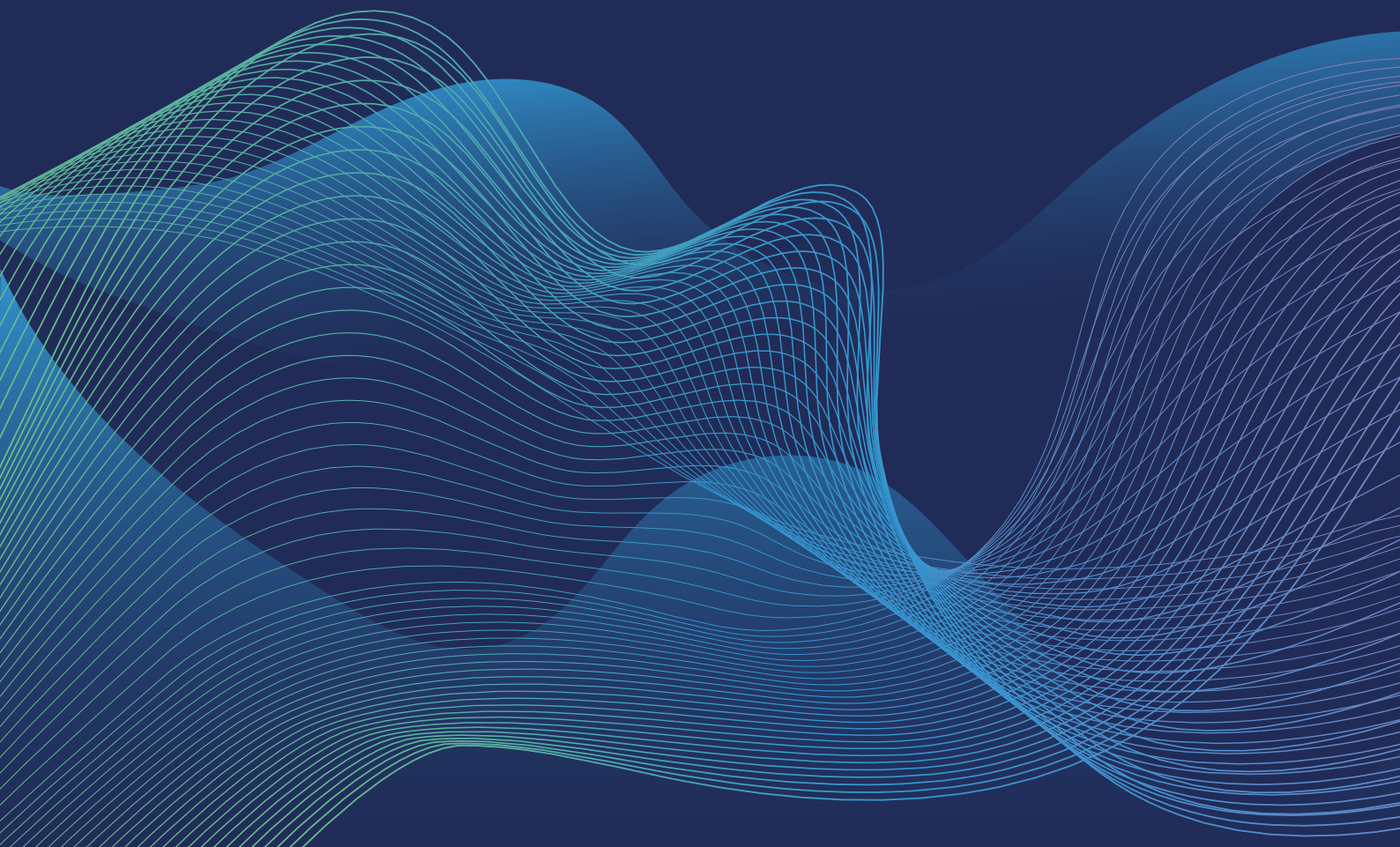
Global Electricity Review 2021
G20 Profile

EMBER
COAL TO CLEAN ENERGY POLICY

INDONESIA

Indonesia defies global trend with more coal in the generation-mix

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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Slow growth in clean electricity means Indonesia has increased its reliance on coal as electricity demand rises

"Indonesia's fast-growing electricity demand means that the country needs a massive step-up in clean electricity even to prevent CO_2 emissions from further increasing. Indonesia's rising reliance on coal for electricity is also at odd with the global trend towards a low-carbon electricity future. It needs to take urgent action to halt its plan for coal capacity expansion and to phase out existing coal capacity."

Muyi Yang
Senior Electricity Policy Analyst - Asia, Ember

Key findings

1 Recent years have seen Indonesia becoming even more reliant on coal generation - a trend contrasting with most other G20 countries

Indonesia's share of coal generation increased from 53% in 2015 to 60% in 2019, whereas the share of coal generation has been falling in most other G20 countries, including China and India. Only Turkey and Russia have seen small rises in coal's market share.

2 As 2020 saw a record fall in coal generation, Indonesia's coal generation was roughly unchanged

In September 2020, Indonesia's national electric utility PLN expected coal intake for electricity generation to decrease slightly (-1.4%) for the year, making the country's coal generation largely unchanged from 2019.

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

In 2019, just 0.2% of Indonesia's electricity came from wind and solar in Indonesia, compared to almost a tenth of electricity globally. Peer G20 countries already have a substantial amount of their electricity from wind and solar: 8.9% for India, 9.5% for China, 10.1% for Japan, 10.6% for Brazil, 11.6% for the United States, and 12.0% for Turkey.

4 Indonesia's fast-growing demand for electricity is not yet being matched by an increase in clean electricity

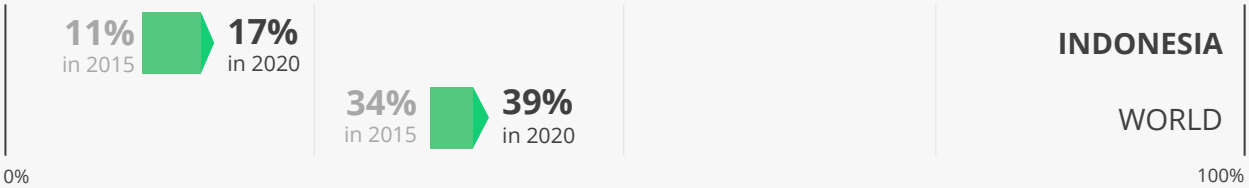
Indonesia's electricity demand grew by an average of 7% per year, from 221 TWh in 2015, to 283 TWh in 2019. This increase (62 TWh) necessitated 51 TWh more coal generation, because the increase in clean electricity (23 TWh) is nothing close to matching rising electricity demand. Further, it is expected that electricity demand will continue to grow rapidly in Indonesia, given that its per capita electricity demand is still one of the lowest among G20 countries and is much less (-230%) than the world average.

5 The electricity regulator of Indonesia should further improve the data quality of the industry

Timely and reliable data is essential to track the progress of low-carbon electricity transition and to inform policy making. In Indonesia, there appears to be very limited electricity data for 2020 in the public domain.

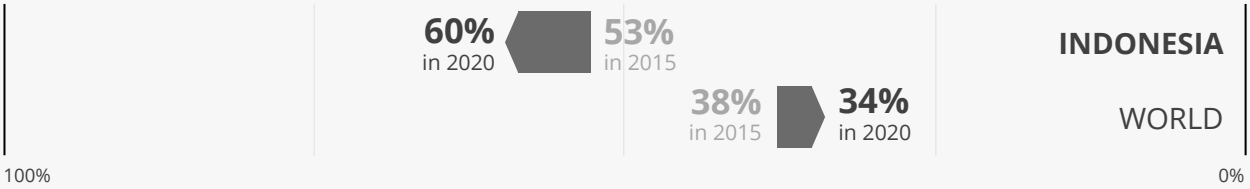
Progress to 100% clean electricity

Percentage of all renewables & nuclear in total generation



Progress on phasing out coal

Percentage of coal in total generation

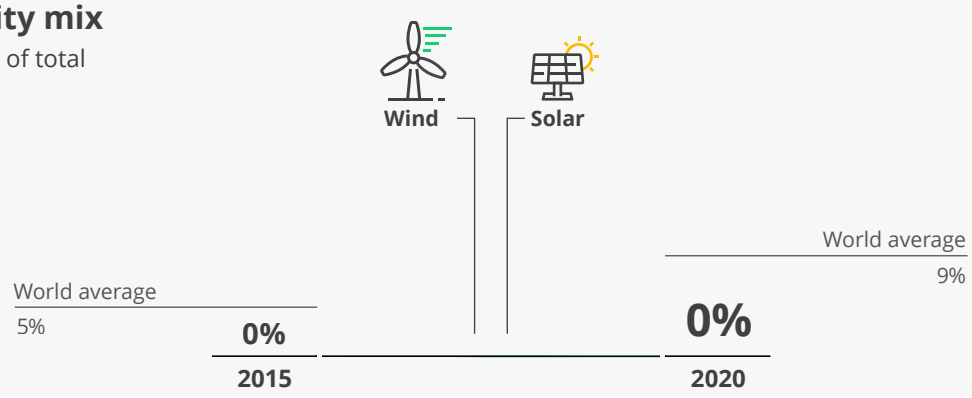


Indonesia's electricity transition in the spotlight: 2015-2020

Indonesia left out of global move to wind and solar

Wind & solar in electricity mix

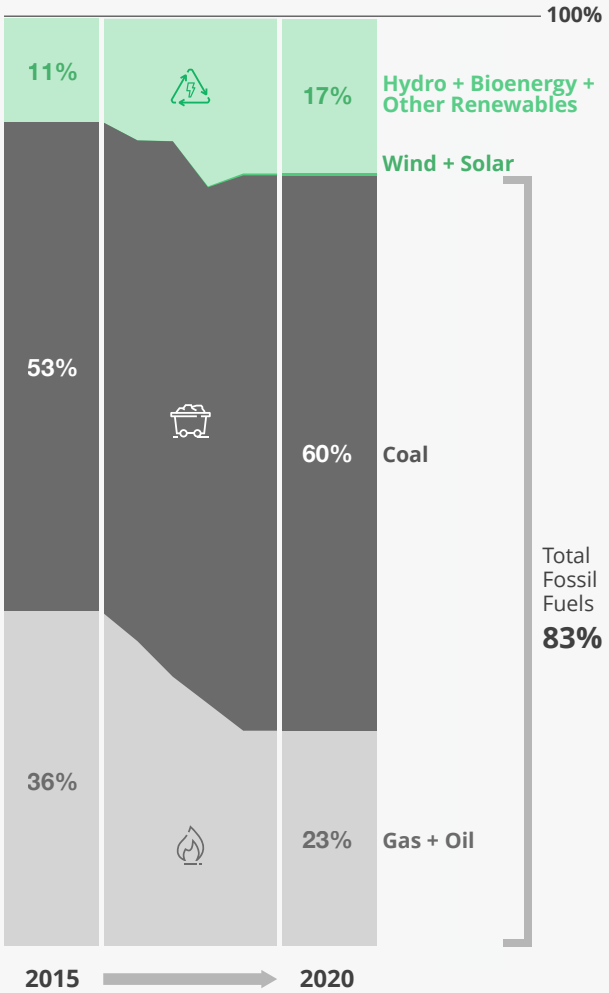
Percentage of total generation



Coal's electricity share has risen

Electricity mix

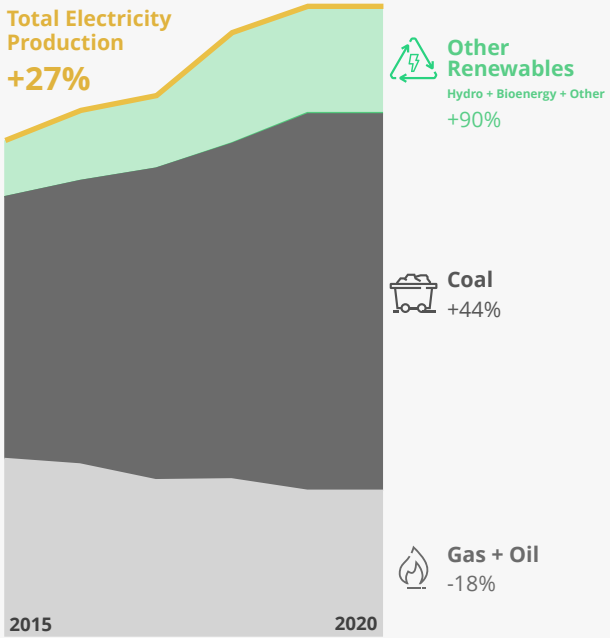
Percentage of total generation



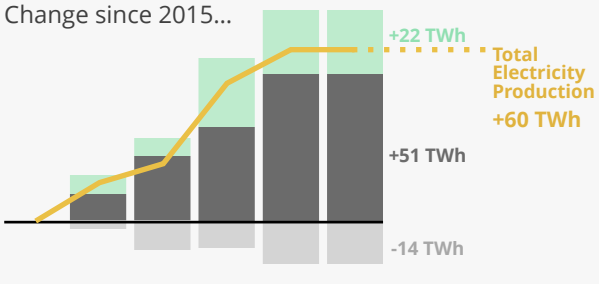
Coal has increased by +44% since 2015

Electricity generation

Terawatt hours



Change since 2015...



The dominance of coal in Indonesia's generation-mix has become further entrenched in recent years. Coal generation had grown steadily in Indonesia from 117 TWh in 2015 to 168 TWh in 2019, and this growth brought coal's market share to 60% in 2019, up from 53% in 2015. Coal intake for electricity generation is expected to only fall slightly (-1.4%) in 2020, even with Covid-19 and stagnant growth of electricity demand, according to PLN (Indonesia's national electric utility). It is also expected that coal generation will resume expansion in Indonesia once the growth of electricity demand rebounds to the pre-pandemic level, given its appeal to the government as a cheap and reliable source of electricity, although wind and solar may soon become cheaper than coal-fired power plants, making much of the coal capacity currently under construction and planned economically unviable, as suggested by Carbon Tracker.

Recent years have also witnessed a surge in hydro, bioenergy and geothermal in Indonesia. Indonesia's renewable generation almost doubled over the period 2015-2019; from 25 TWh in 2015 to 48 TWh in 2019. Of this, more than 30% (7 TWh) is from hydro, and 43% (10 TWh), from bioenergy. Other renewables (mostly geothermal) also made a noticeable contribution of 5 TWh (22%) to this growth. The contribution of wind and solar generation, however, is marginal (4%). The expansion of renewable generation has not affected coal's dominant position in Indonesia's generation-mix. The expansion of renewable generation, as discussed above, brought its market share to 17% in 2019, up from 11% in 2015. Unlike almost everywhere else, renewables did not take any market share from coal in Indonesia. Rather, they replaced gas and oil in the generation-mix.

Indonesia's fast-growing electricity demand makes its transition away from coal even more challenging. Indonesia's electricity demand grew by an average of 7% per year over the period 2015-2019. Although the growth of electricity demand has slowed significantly in the first half of 2020, it started to show some signs of recovery in the third quarter. The rebound of electricity demand growth to its pre-pandemic level will make Indonesia's transition away from coal for electricity even more challenging to attain, because more renewable capacities would need to be built to meet the rising new demand for electricity, as well as replacing coal to meet the existing demand.

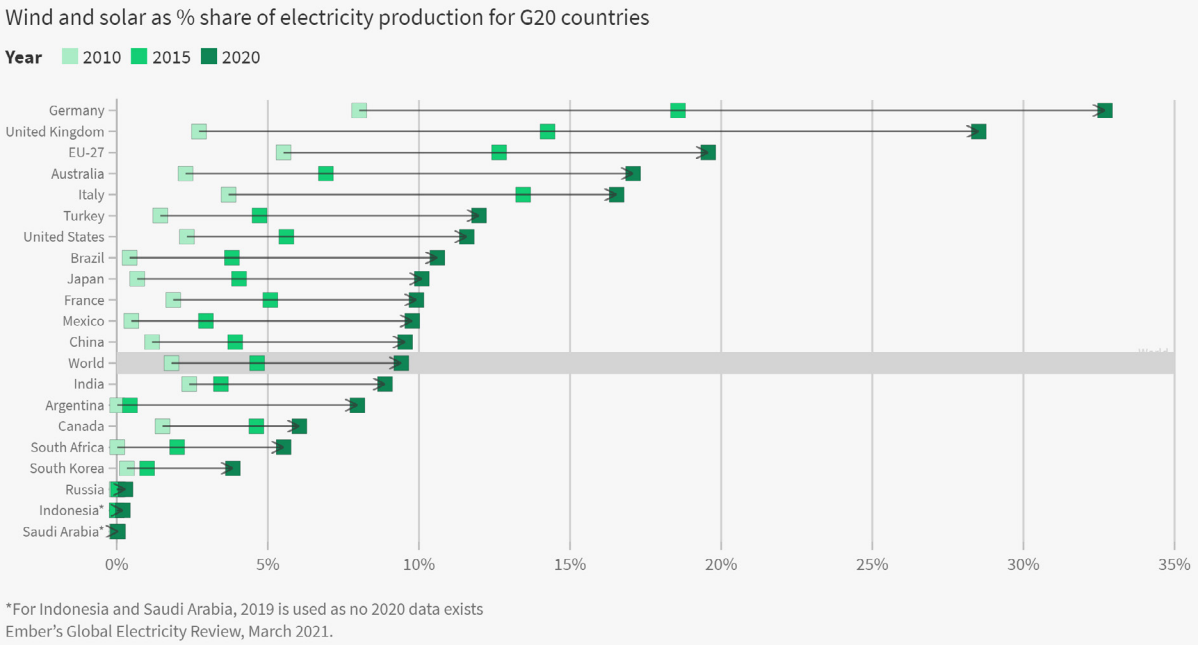
What happened in 2020?

The growth of electricity demand stalled in Indonesia in 2020, especially after March, when local governments enacted large-scale social restrictions to halt the spread of the Covd-19 pandemic. Earlier in the year, the national electric utility PLN expected electricity demand to decline by 9.7% from the initial target. However, the actual impact seems to be less-than-expected, as the electrification director general of the Energy and Mineral Resources Ministry said later in July that Indonesia's electricity demand may fall by 6.25% year-on-year in 2020. In fact, the growth of electricity demand seemed to have resumed in the third quarter of last year with the ease of restriction measures, and by September, PLN sold 0.6% more electricity than 2019.

Policy response to Covid-19 seems to have caused a limited impact on coal generation in Indonesia, as coal intake for electricity generation is only expected to have decreased slightly (1.4%) in 2020, according to PLN. This means that the country's share of coal generation is very likely to remain at around 60% last year, making its electricity supply one of the world's most coal-intensive. Indonesia's coal-fired generating capacity also expanded in 2020 with 520 MW of new capacity added in the first half of the year, bringing the country's total coal-fired generating capacity to 35.2 GW - Asia's fifth largest coal fleet after China, India, Japan and South Korea. Indonesia's growth of renewable capacity, however, appeared to be slow in 2020 when compared with that for coal. By the fourth quarter of 2020, only 187.5 MW of new renewable capacity was added, much less than the new coal capacity of 520 MW added in the first half of the year.

Indonesia’s transition in comparison with G20 countries

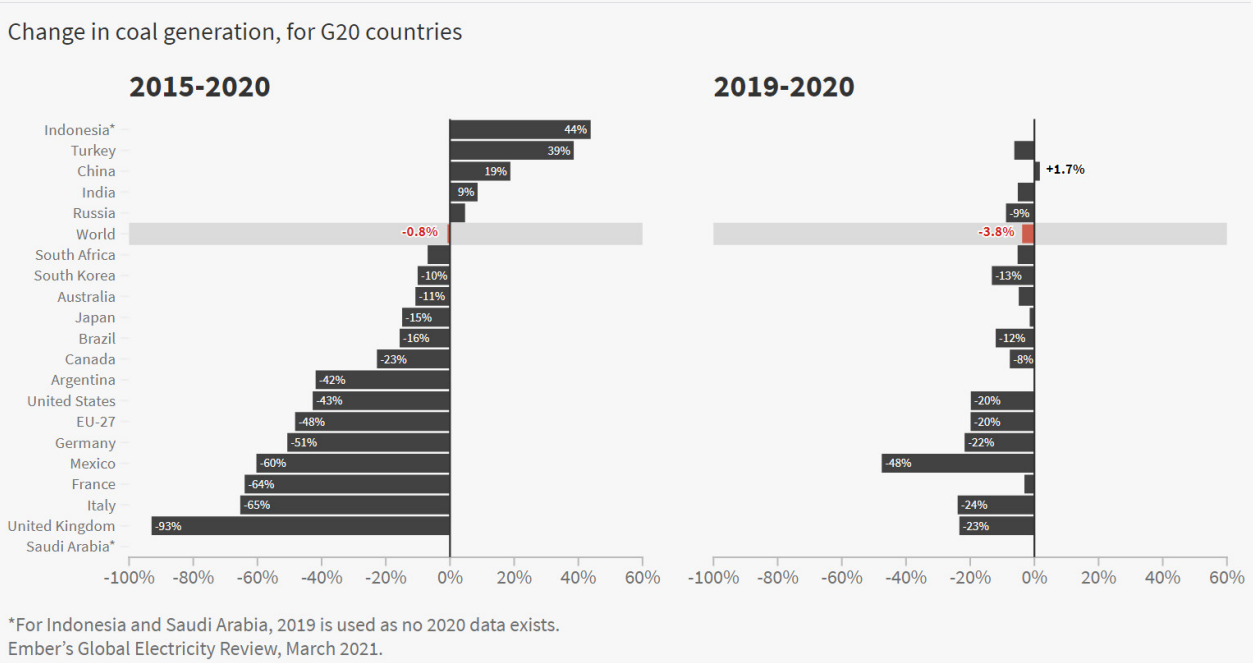
Indonesia’s wind and solar generation is far less than the world average



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

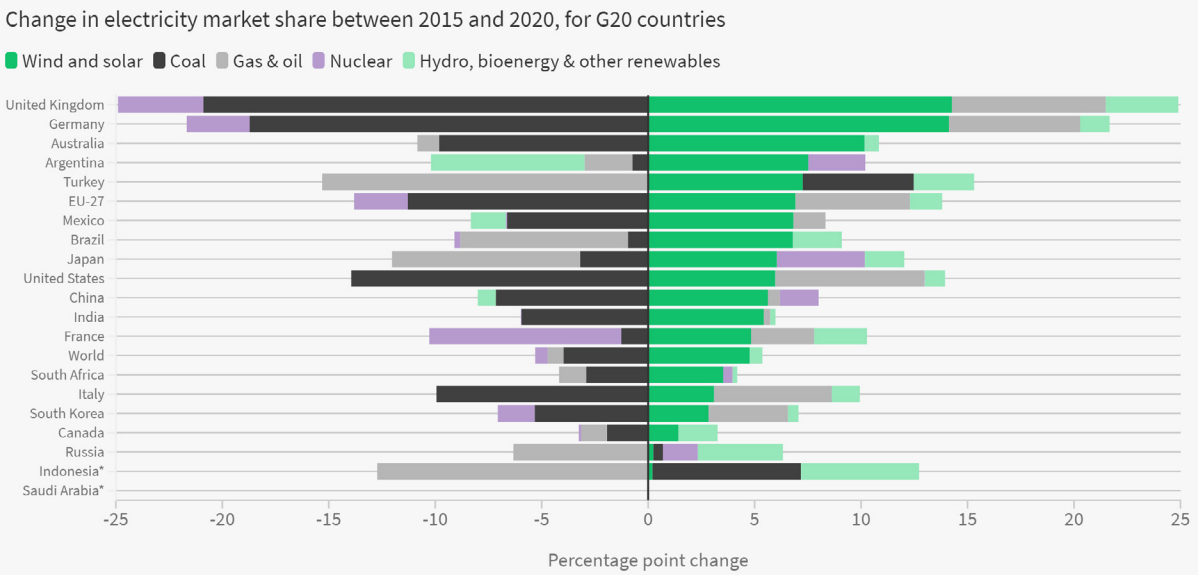
Indonesia has made very limited progress in promoting wind and solar generation. In 2019, wind and solar generation only accounted for 0.2% of total electricity generated in the country. Given the significant delays in renewable project execution and the government’s continued support for coal generation last year, it is very unlikely that Indonesia has increased the market share of wind and solar generation to anywhere close to the world average (9.4%) in 2020, from such a low starting point.

Indonesia sees the largest increase in coal generation among G20 countries



In Indonesia, coal generation increased significantly from 117 TWh in 2015 to 168 TWh in 2019, and it is very likely to remain roughly at that level in 2020, as coal intake for electricity generation is only expected to reduce slightly in 2020. This suggests a more than 40% increase in coal generation in Indonesia between 2015 and 2020 - the largest among G20 countries. Other G20 countries where coal generation also increased in that period are: Turkey (39%), China (19%), India (9%), and Russia (5%). Even in these countries, however, coal has shown some signs of retreat from the generation-mix in more recent years, as indicated by falling coal generation in either relative (China and India) or absolute (Turkey and Russia) terms. In contrast, coal generation has continued to expand in Indonesia in both relative and absolute terms.

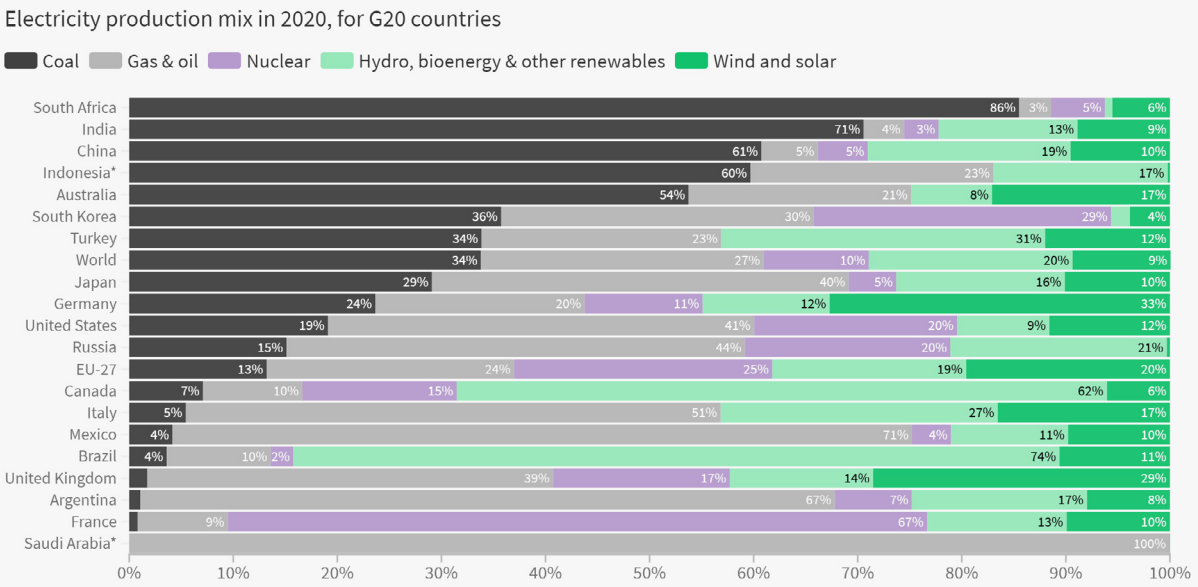
Indonesia defies global trend with more coal in the generation-mix since 2015



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

Indonesia is one of the three outliers among G20 countries where coal has gained 7% of market share since 2015. The other two countries are Russia and Turkey. In these two countries, coal generation has started to fall since 2018: from 179 TWh in 2018 to 155 TWh in 2020 for Russia, and from 106 TWh in 2018 to 99 TWh in 2020 for Turkey. In contrast, coal generation has continued to expand in Indonesia, with continued government support for coal capacity expansion.

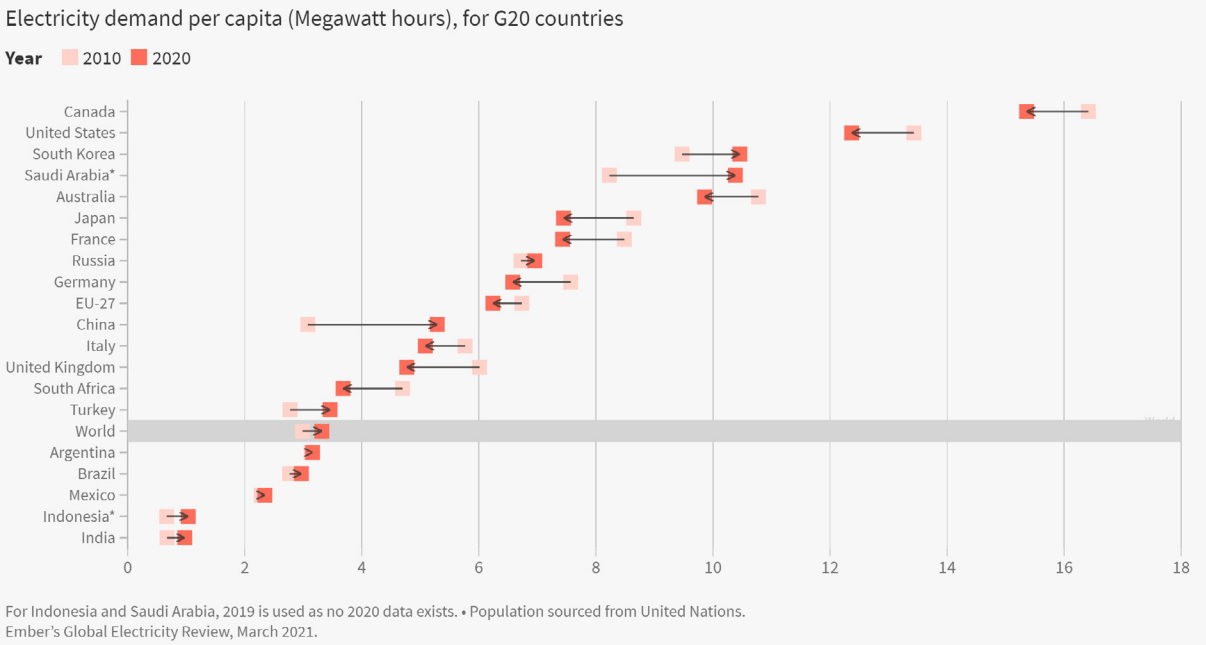
Coal continues to dominate Indonesia’s generation-mix



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

Indonesia’s generation-mix is still dominated by coal, which accounts for about 60% of the electricity generated in 2019. It is very unlikely that Indonesia’s electricity generation-mix has changed drastically in 2020. This means that Indonesia has one of the most coal-intensive power sectors among G20 countries. Other G20 countries with a similar dependence on coal generation in 2020 include South Africa (86%), India (71%), China (61%) and Australia (54%).

Indonesia’s per capita electricity demand far less than the world average



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.

Indonesia’s per capita electricity demand increased by over 40% since 2015. Despite this, it is still one of the lowest among G20 countries, and much less (-230%) than the world average. The increase of Indonesia’s per capita electricity demand to the world average would see a substantial growth of electricity demand, making its transition away from coal for electricity even more difficult to attain.

Concluding remarks

Indonesia is a laggard in terms of the transition away from coal for electricity. Here, coal generation has continued to expand, reaching 168 TWh in 2019. Coal accounted for 60% of the electricity generated in the year, up from 53% in 2015. In contrast, coal generation has been falling in most other G20 countries since 2015, except for Turkey, China, India, and Russia. Even in these countries, however, coal has shown some signs of retreat from the generation-mix in more recent years, with falling coal generation in either relative (China and India) or absolute (Turkey and Russia) terms.

Further, Indonesia's expansion of coal generation is likely to continue, if not accelerate, in the coming years, especially if one notes its large plan for coal capacity additions. If fully implemented, this plan will bring the country's coal capacity to 57 GW by 2028, up from 35.2 GW in 2020 - a more than 60% increase within 8 years. This places Indonesia in stark contrast with the need to halt the development of new coal capacity and phase out existing coal capacity, in order to put the world on track for 1.5 degrees. This also suggests that Indonesia must take urgent action to embark on its transition toward a low-carbon electricity future. The key question now is whether Indonesia can commit itself to such a journey, to give the world a better chance of avoiding the catastrophic consequences of climate change.

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
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	Germany	English	Deutsch
	India	English	
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	Italy	English	Italiano
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	Mexico	English	Español
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	Saudi Arabia	English	عربي
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	South Korea	English	한국어
	Turkey	English	Türk
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	United States	English	

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