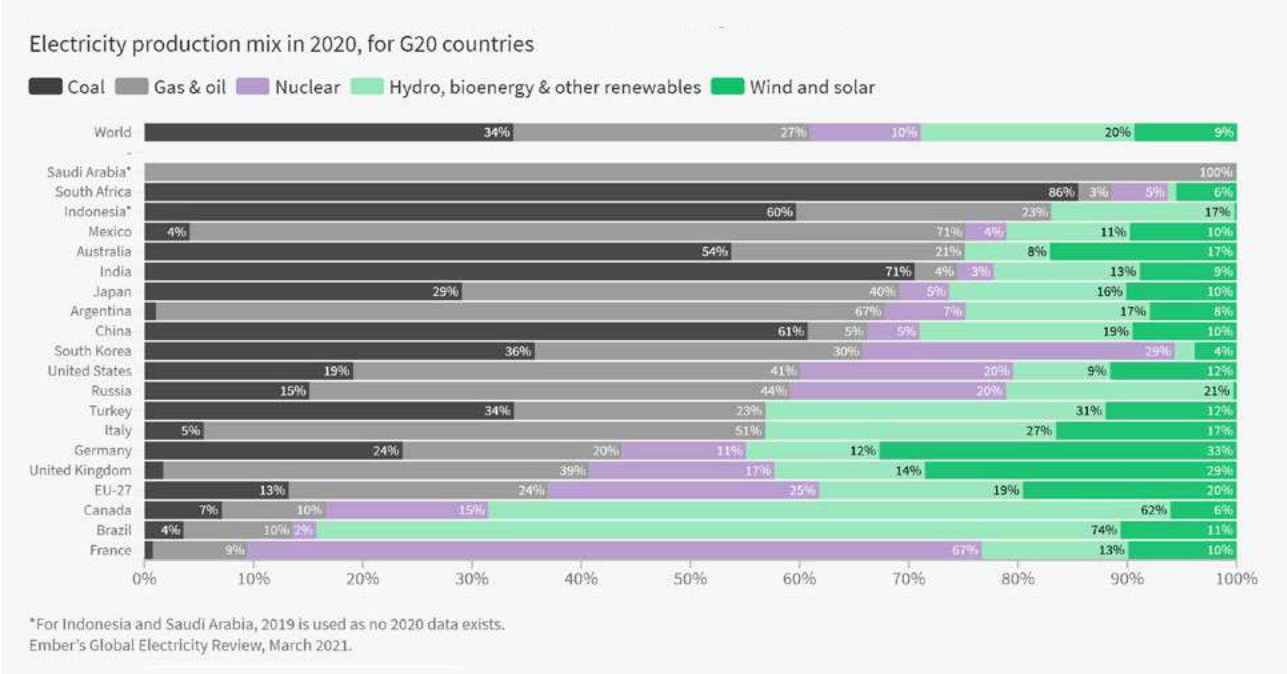
The world still has a long way to go to stop burning fossil fuels for electricity



61% of the world's electricity still came from fossil fuels in 2020. While the global focus needs to be on quickly phasing out coal generation, gas and oil generation also need to decline rapidly. In 2020, 23% of the world's electricity still came from gas. A further 4% was from other fossil fuels, such as oil.

There are five G20 countries that had over three-quarters of their electricity supplied from fossil fuels in 2020: Saudi Arabia (100%), South Africa (89%), Indonesia (83%), Mexico (75%) and Australia (75%).

Fossil use in the UK and EU-27 electricity has fallen, but fossil fuels still contribute 41% and 37% respectively. Even the historically cleaner electricity systems of France, Brazil and Canada still have some electricity from fossil fuels.

Conclusion

The global electricity transition is on a crash course with climate targets. Clean electricity is not yet being built quickly enough to keep pace with rising electricity demand. Wind and solar have provided the majority of the growth in clean electricity, with hydro and nuclear generation barely increasing. But even as wind and solar have risen to nearly a tenth of world electricity, their growth has slowed in recent years. This slow pace and lack of ambition is locking in reliance on fossil fuels.

2019 and 2020 bucked the trend as electricity demand temporarily slowed, which led to two record drops in coal generation. But even that wasn't enough to put the world on target. Electricity demand will undoubtedly pick up again soon, especially as the world looks to electrify all the sectors still relying on fossil fuels.

We can't let "mid-century net-zero targets" distract from the immediate need to focus on a quick transition out of burning coal for electricity.

Methodology

Summary

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. A detailed methodology can be accessed here.

Disclaimer

The data used in this report is provided on an 'as is' basis, and was assembled using the best available data at the time of publication. We take no responsibility for errors. Please do contact us if you spot any errors or have suggestions at info@ember-climate.org

Methodology

Definitions

Generation data is mapped into nine generation types. More information on mapping for different sources and countries can be accessed here. For the purpose of analysis these generation types are aggregated into different groupings as follows

<table>
<tr><td colspan="10">Demand</td></tr>
<tr><td colspan="9">Production</td><td></td></tr>
<tr><td colspan="5">Renewables</td><td colspan="4">Fossils</td><td></td><td></td></tr>
<tr><td colspan="2">Wind & Solar</td><td colspan="3">Hydro, Bioenergy & Other Renewables</td><td></td><td colspan="3">Gas & Oil</td><td></td><td></td></tr>
<tr><td>Wind</td><td>Solar[1]</td><td>Hydro[2]</td><td>Bio energy[3]</td><td>Other Renewables[4]</td><td>Coal</td><td>Gas</td><td>Other Fossils[5]</td><td>Nuclear</td><td>Net Imports</td></tr>
</table>

[1] Solar includes both solar thermal and solar photovoltaic generation, and where possible distributed solar generation is included.
[2] Where possible, hydro generation excludes any contribution from pumped hydro generation.
[3] Bioenergy generation includes generation from combustible renewables. For certain historical data sources all waste generation (renewable and non-renewable) is not disaggregated from other combustible renewables generation - this has all been mapped to bioenergy.
[4] Other renewables generation includes geothermal, tidal and wave generation.
[5] Other fossil generation includes generation from oil and petroleum products, as well as manufactured gases.

For the purposes of this report, renewables are classified in line with the IPCC and include bioenergy. However, the climate impact of bioenergy is highly dependent on the feedstock, how it was sourced and what would have happened had the feedstock not been burnt for energy. The current EU bioenergy sustainability criteria do not sufficiently regulate out high-risk feedstocks and therefore electricity generation from bioenergy cannot be automatically assumed to deliver similar climate benefits to other renewables sources (such as wind and solar) over timescales relevant to meeting the commitments of the Paris Agreement. For more information please see Ember's reports: The Burning Issue (June 2020) and Playing with Fire (December 2019).

Methodology

Historical data

Data from the United States Energy Information Administration's (EIA) international data browser forms the backbone of this report. With the exception of China, India, EU-27 and the United States, all data from 2000-2019 is taken from this source. For some generation types in non-OECD countries, 2019 data had not yet been published by the EIA. Where available, we used national data to estimate these values, otherwise, the average change for that generation type seen over 2015-2018 was added onto the 2018 generation value.

Thermal disaggregation

EIA international data does not disaggregate generation from fossil fuels. This was performed by Ember using two methods. If possible, the split between fossil fuels was estimated using the ratios of fossil generation types in BP's statistical review of world energy. Fossil generation was disaggregated for any remaining countries by using the capacity split by fossil fuel type, taken from the WRI's global power plant database.

2020 data

Data for 2020 is estimated using national sources. The year-on-year changes in generation for each fuel type from these sources are added onto the historical 2019 data to obtain a value for 2020. Data sources for Argentina, Canada, Ecuador, Kazakhstan and Russia provide no disaggregation of thermal generation - for these countries, estimates of the split between different generation types were made using the IEA's monthly electricity generation statistics and BP's statistical review of world energy.

World estimate

World data for 2000-2019 is the sum of all country data. World data for 2020 is estimated by summing generation for all countries where we have 2019 and 2020 data. Together this comprises 90% of global generation. The percentage changes in each fuel type from 2019 to 2020 are then applied to the world generation data for 2019, to create an estimate of global generation in 2020.

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

The information in this report is complete and correct to the best of our knowledge, but if you spot an error, please email info@ember-climate.org

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