Key findings

Wind and solar drive a record fall in coal in 2020 - but only because the pandemic paused rising electricity demand

1 Pandemic paused electricity demand growth.

Global electricity demand fell slightly (-0.1%) in 2020, the first fall since 2009. But this pause has already ended: by December 2020, electricity demand was already higher than in December 2019 (India +5%, EU +2%, Japan +3%, South Korea +2%, Turkey +3%, US +2%).

2 Wind and solar showed resilient growth, rising to supply almost a tenth of global electricity.

Wind and solar generation rose robustly in 2020 by 15% (+314 TWh). This meant that wind and solar produced almost a tenth (9.4%) of the world's electricity last year, doubling from 4.6% in 2015. Many G20 countries now get around a tenth of their electricity from wind and solar: India (9%), China (9.5%), Japan (10%), Brazil (11%), the US (12%) and Turkey (12%). Europe is leading the way, with Germany at 33% and the United Kingdom at 29%. Indonesia, Russia and Saudi Arabia still have near-zero.

3 Wind and solar helped push coal power to a record fall.

Coal fell a record 4% (-346 TWh). This was similar to the rise in wind and solar power of 314 TWh, more than the UK's entire electricity production. This dwarfed the aggregate changes across global electricity: demand fell 23 TWh, gas and oil fell 12 TWh. A rise in hydro of 94 TWh was mostly countered by a fall of 104 TWh of nuclear. In comparison, coal collapsed almost everywhere, with large falls in the US (-20%), EU (-20%) and even India (-5%).

4 China was the only G20 country with a large increase in coal generation.

China's coal generation rose by 2% in 2020. That was because electricity demand growth continued to outstrip new clean electricity. China's electricity demand was 33% higher in 2020 than in 2015, rising by more than all electricity demand in India in 2020. Across those five years, China's fossil-free generation met only 54% of the rise in electricity demand, so 46% was met from fossil generation. That pushed China's coal generation 19% higher in five years. China is now responsible for more than half (53%) of the world's coal-fired electricity, up from 44% in 2015.

5 Global power sector emissions were still higher than in 2015, when the Paris climate agreement was signed.

Electricity demand rose 11% (+2536 TWh) since 2015, but the increase in clean electricity generation (+2107 TWh) didn't keep up. That led to an increase in overall fossil generation: gas-fired electricity rose 11% (+562 TWh) and coal fell only 0.8% (-71 TWh) . As a result, power sector CO2 emissions were around 2% higher in 2020 than in 2015.

Fossil-free electricity met only 54% of the rise in electricity demand in China, 57% in India and 37% in Indonesia. Meanwhile in Europe, and especially the US, coal's fall was caused not only by a rise in clean electricity, but also a rise in gas generation. Of the 10% rise in global gas generation since 2015, half of that was in the United States.

Contents

"Progress is nowhere near fast enough. Despite coal's record drop during the pandemic, it still fell short of what is needed. Coal power needs to collapse by 80% by 2030 to avoid dangerous levels of warming above 1.5 degrees. We need to build enough clean electricity to simultaneously replace coal and electrify the global economy. World leaders have yet to wake up to the enormity of the challenge."

Dave Jones

Global Programme Lead, Ember

"Despite some progress, China is still struggling to curb its coal generation growth. Fast-rising demand for electricity is driving up coal power and emissions. More sustainable demand growth will enable China to phase out its large coal fleet, especially the least efficient sub-critical coal units, and provide greater opportunity for the country to attain its climate aspirations."

Muyi Yang

Senior Electricity Policy Analyst - Asia, Ember

"India has started its clean electricity transition. India now needs to ramp up wind and solar considerably in the next decade to both replace coal and meet rising electricity demand. India has the opportunity to ensure that coal generation doesn't see a resurgence after the last two years of coal falling."

Aditya Lolla

Senior Electricity Policy Analyst - Asia, Ember