

The rise and fall of coal: 2020 transition trends

Chris Littlecott and Leo Roberts, 2 March 2021

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- The Covid-19 pandemic heavily impacted on coal power generation during 2020, particularly during H1. Steep declines in demand for electricity resulted in even larger falls in coal generation. <u>IEA figures released today</u> report that coal power generation fell to 35% of global electricity production, down from 37% in 2019. This contributed to a 4% decline in CO2 emissions from coal across 2020. Power plant load factors fell further and the viability of both operating coal power plants and new project proposals continued to decline. The growth in renewables saw coal challenged economically and operationally in multiple markets.
- During 2020, the global capacity of coal power plants saw a small net increase, due to increased construction in China.
- Our analysis highlights that there are three very different trends present across three categories of countries:
 - Falling capacity: In the OECD and EU, retirements are accelerating and the last remnants of the new project pipeline continue to shrink. The only way is down, with coal phase out by 2030 now a plausible outcome.
 - ➤ **Rising risks**: Only China saw its capacity and project pipeline grow in 2020, resulting in a net increase in operating capacity, despite 11GW of retirements. The pursuit of new coal by Provinces puts at risk China's commitment to net zero by 2060.
 - **Pivoting from coal to clean**: The non-OECD (excluding China) saw a continued reduction in the project pipeline, as governments start to take proactive action to restrict further coal plants being permitted and / or constructed.

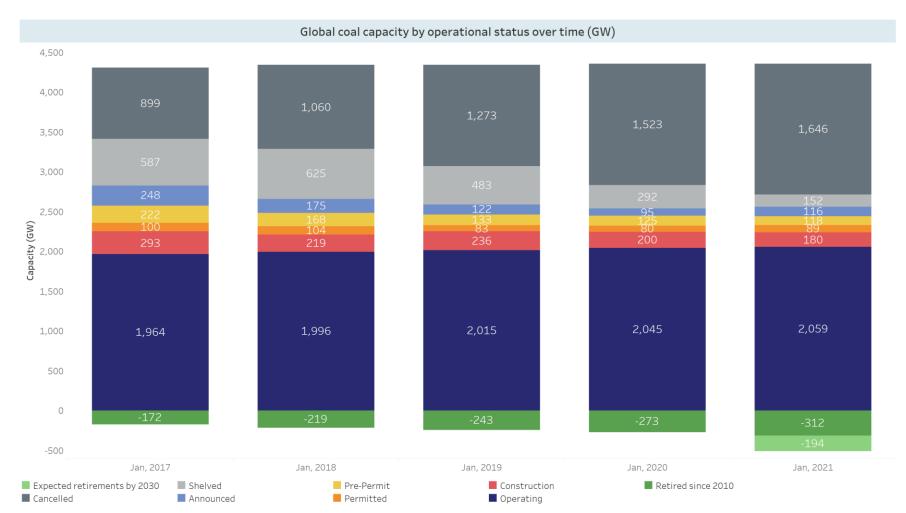
OECD and EU progress led by members of the Powering Past Coal Alliance:

- 56% of OECD & EU countries are now <u>members of the Powering Past Coal Alliance</u> (23 countries).
- 411GW (56%) of operating coal from the OECD and EU28 has either retired since 2010 (217GW), or is scheduled to retire by 2030 (194GW). Of this, PPCA members are home to 147GW (36%) of coal capacity that has either closed since 2010 or will close by 2030.

Five Years: Increasing Retirements and Cancellations



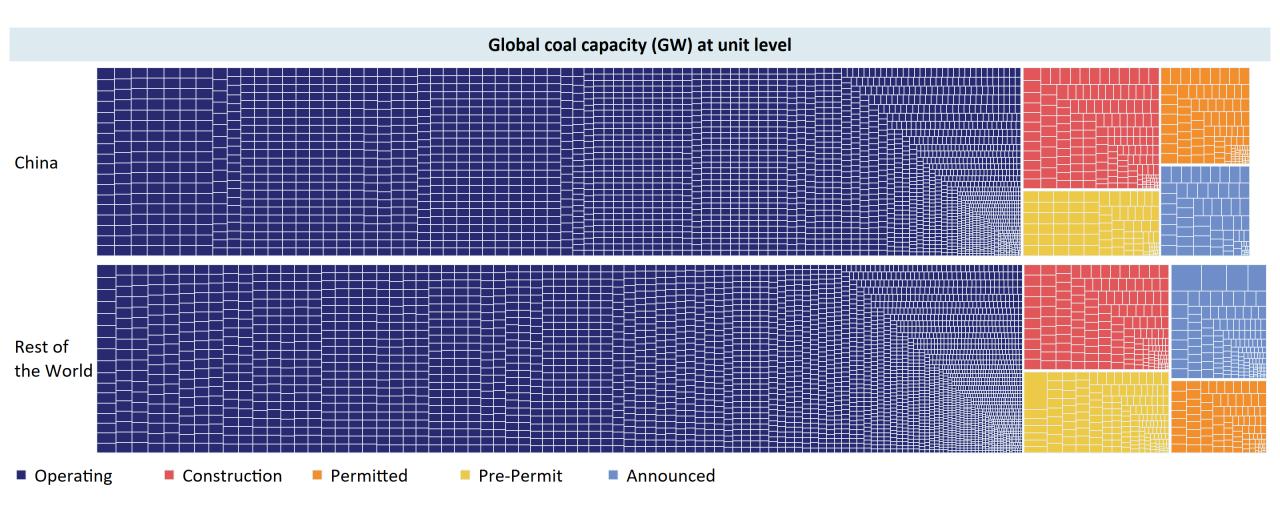
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- The global coal fleet grew slightly across 2020, as H2 growth offset H1 closures and cancellations. The pipeline of new projects also grew overall, but only as a result of new projects being proposed in China.
- As of January 2021 the OECD and EU28 accounted for 25% of the global operating coal fleet (down 2% on the previous year). Retirements are increasing, with governments making commitments to phase out coal power generation, in almost all cases by 2030 (or earlier).
- While total global coal power generation capacity has only grown slightly since 2015, the past five years has seen a **sharp increase in the number of coal plants cancelled each year**, as the economic case for new coal capacity declines and public and private sources of finance grow scarcer.

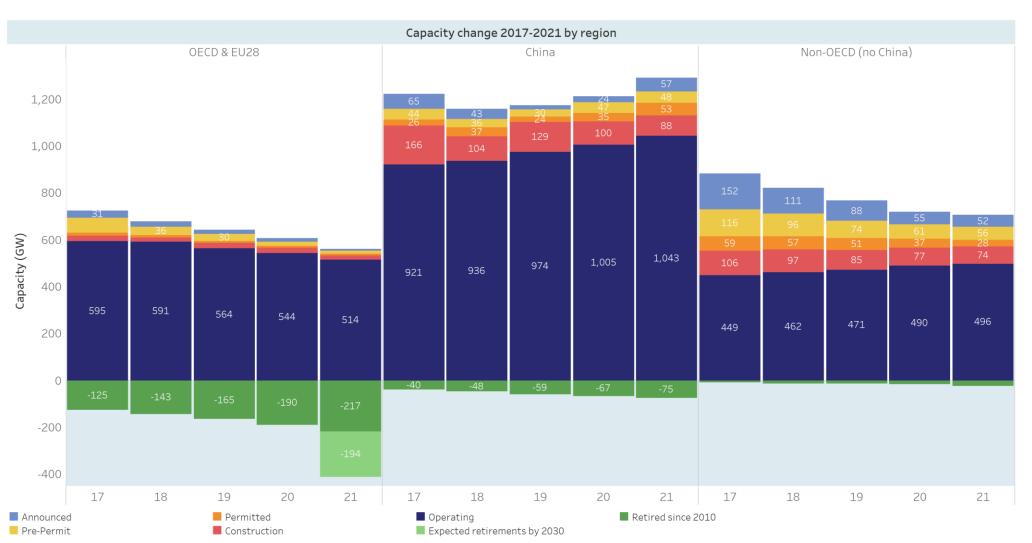
China accounts for over half the world's operating coal capacity, and almost half the project pipeline





Three categories, three trends





- In the OECD and EU, retirements are accelerating and the last remnants of the new project pipeline continue to shrink.
- Only China saw the project pipeline grow in 2020, resulting in a net increase in operating capacity, despite 11GW of retirements of older power plants.
- The non-OECD (excluding China) saw a continued reduction in the project pipeline, as governments start to take proactive action to restrict further coal plants being permitted and / or constructed.

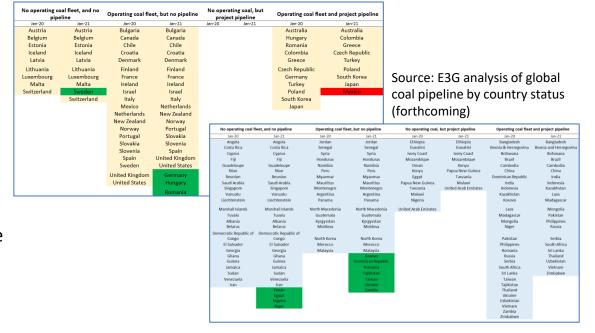
Changes: country status and project pipelines



- The OECD saw a net reduction in capacity of 23GW during 2020, following continued retirements in EU, UK, and USA.
 - ➤ The final coal plant in Germany entered into operation after a decade of disputes and delays.
 - Only Japan, South Korea, Turkey and Poland have coal plants under construction. The pipeline of new projects under development shrank elsewhere.
 - Mexico dropped down the OECD scorecard ranking as government policies promote fossil fuels over renewables. Mexico was alone among the OECD in seeing a proposal made for a new (uneconomic) coal power plant.
- Non-OECD countries beyond China saw a reduction in the size of the new project pipeline, with governments starting to take proactive action to restrict further coal plants being permitted and / or constructed. See slide 11 below for further details.
- 5 countries, became coal free during the course of 2020 by closing their last power plant (Sweden), or seeing projects cancelled (Oman, Nigeria, Niger and Egypt).
- 9 additional countries no longer have a pipeline of proposed new coal projects, including Germany, Hungary, and Romania. Beyond the OECD, Kosovo, Dominican Republic, Tajikistan, Taiwan, Ukraine and Zambia all saw the cancellation of their project pipelines.
- China alone saw growth in capacity and the new project development pipeline in 2020. The addition of 39GW of new capacity was three times larger than the rest of the world combined. This resulted in a net increase in operating capacity of 30GW, despite 9GW of retirements of older power plant. See slide 9 below for further details.

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	2020 Additions	2020 Retirements	Net change		
OECD & EU	4.6GW	27GW	-23GW		
China	39GW	9GW	30GW		
Non-OECD	7GW	2GW	5GW		



Coal Transition Progress Ranking: OECD & EU28 Countries

Sources: Global Energy Monitor, Ember, E3G Analysis. Capacity data to end of 2020, generation data to July 2020.



Country & PP Membershi		Coal phase-out date	Coal % in electricity generation & 5 year trend (个)	Retirements (since 2010)	Operating	Construction	Permitted	Pre- Permit	Announced	Shelved (since 2010)	Cancelled (since 2010)
Latvia	~	Coal Free									
Lithuania		Coal Free									
Estonia	×	Coal Free									
Iceland	×	Coal Free - 1951									
Switzerland	×	Coal Free - <1965									
Malta	×	Coal Free - 1996									
Luxembourg	~	Coal Free - 1998		2							1
Belgium	~	Coal Free - 2016		<1							
Sweden	-	Coal Free - 2020		2							1
Austria	*	Coal Free - 2020	420/		2						
Portugal	*	2023	12% 1% 2% 6%	5	3						
France	*	2022	1%	30	6						10
UK	*	2024 2025	2% 6%	2	8						7
Italy Ireland	Ž	2025	7%		1						
Finland	Ž	2029	7%	2	2						<1
Netherlands	Ž	2029	14%	4	4						1
New Zealand	Ž	2030	7%	1	1						
Slovakia	Ž	2030	8%	<1	1						1
Canada	Ž	2030	9%	10	8						2
Denmark	V	2030	15%	4	1						
Israel	V	2030	32%		5						1
Hungary	V	2030	14%	1	1						4
Greece	V	2030	24%	2	3	1					1
Germany	V	2038	7% 7% 7% 14% 7% 8% 9% 15% 32% 14% 24% 28% 23% 5% 11%	18	43						20
Chile		2040	23%	<1	5					1	10
Norway	×××××××	No Date	•		<1						
Spain	X	No Date	5%	8	5						1
Croatia	×	No Date	11%		<1						1
USA	×	No Date	23% 28% 42%	119	234						28
Slovenia	×	No Date	28%	1	1						
Bulgaria	×	No Date	42%	1	5						3
Romania		No Date	22%	2	5						6
Mexico	~	No Date	7%		5				1		2
Czechia	X	No Date	43%	2	8						1
Australia	X	No Date	57%	6	25			1	2	1	9
Colombia	X	No Date	6%		2		1			<1	1
Poland	X	No Date	74%	5	30	<1		1		3	22
Turkey	X	No Date	36%		18	2	5	11		7	76
South Korea	×××××	No Date	22% 7% 43% 57% 6% 74% 36% 42% 30%	2	36	7					8
Japan	X	No Date	30% €	3	48	7	1	1		<1	10

56% of OECD & EU capacity has either closed already or is committed to retire by 2030



- 56% of OECD & EU countries are <u>members of the Powering Past</u> <u>Coal Alliance</u> (23 countries).
- **411GW (56%)** of operating coal from the OECD and EU28 has either retired since 2010 **(217GW)**, or is scheduled to retire by 2030 **(194GW)**.
 - ➤ Of this, PPCA members are home **to 147GW (36%)** of coal capacity that has either closed since 2010 or will close by 2030.
 - ➤ Coal retirements accelerated over the past four years in the USA, despite the pro-coal actions of the Trump Administration.
- A further 29GW (4%) of OECD & EU coal capacity is scheduled to close, but not until after 2030 (and thus not yet aligned to a Pariscompatible phase-out pathway). This includes capacity in Germany, South Korea, Chile, Mexico.
- The remaining 291GW (40%) of operating coal in the OECD & EU28 currently does not yet have a planned closure date. This includes 165GW in the USA, 26-28GW each in Japan, Poland and South Korea, 19GW in Australia, 18GW Turkey, and 7GW in Czechia.

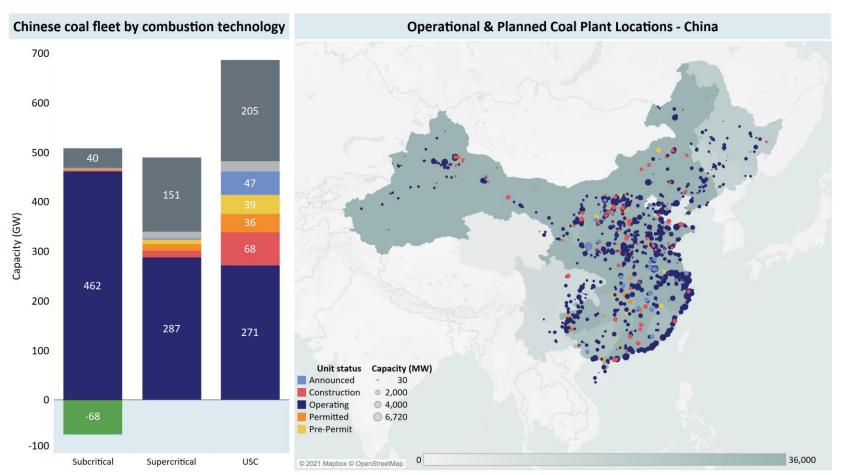
OECD & EU28 phase-out status

No retirement commitment (291GW)	Committed to retire by 2030 (194GW)
Retired since 2010 (217GW)	Committed to retire post-2030 (29GW)

Under Pressure: China coal use in the spotlight



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China saw increased construction and proposed projects in 2020, driven by Provincial responses to the economic downturn, despite overcapacity. See GEM & CREA, February 2021.

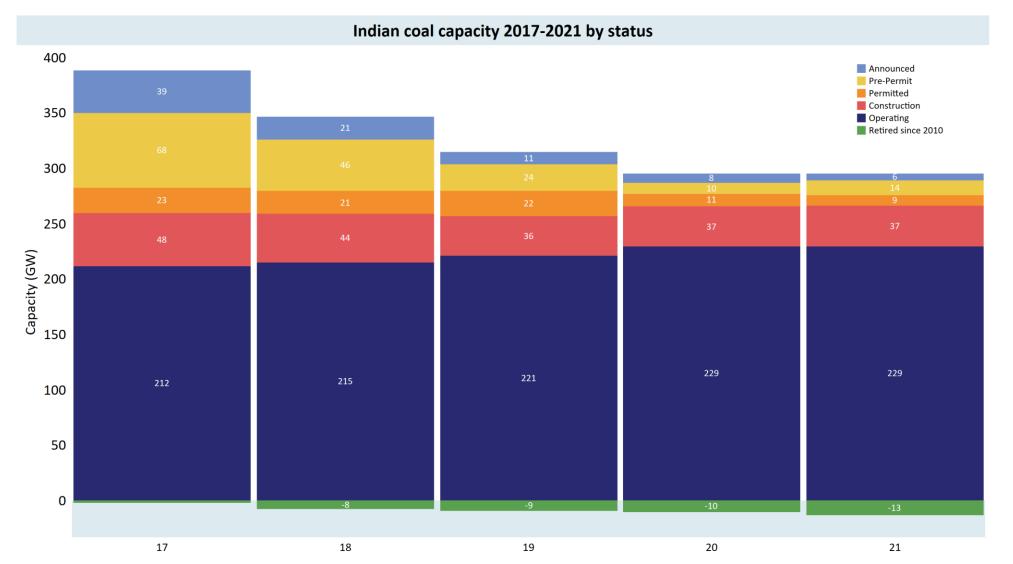
China's construction of new coal meant that the global capacity of coal power plants saw a net increase, despite retirements in the OECD and EU. The EU and Biden Administration have openly criticised China's support for coal at home and abroad.

The impending 14th 5 Year Plan will be crucial for signalling whether the government will act to restrict coal capacity and encourage retirements to put it on a pathway to net zero by 2060. China has a track record of retiring subcritical coal power plants – already 68GW since 2010. It will need to develop an accelerated retirement plan for these less efficient units over the coming decade.

A further 7GW of coal has been retired, however the combustion technology for these units is unknown and not included in this graphic.

2020 saw India's pipeline stagnate, with no new coal plants expected to initiate construction

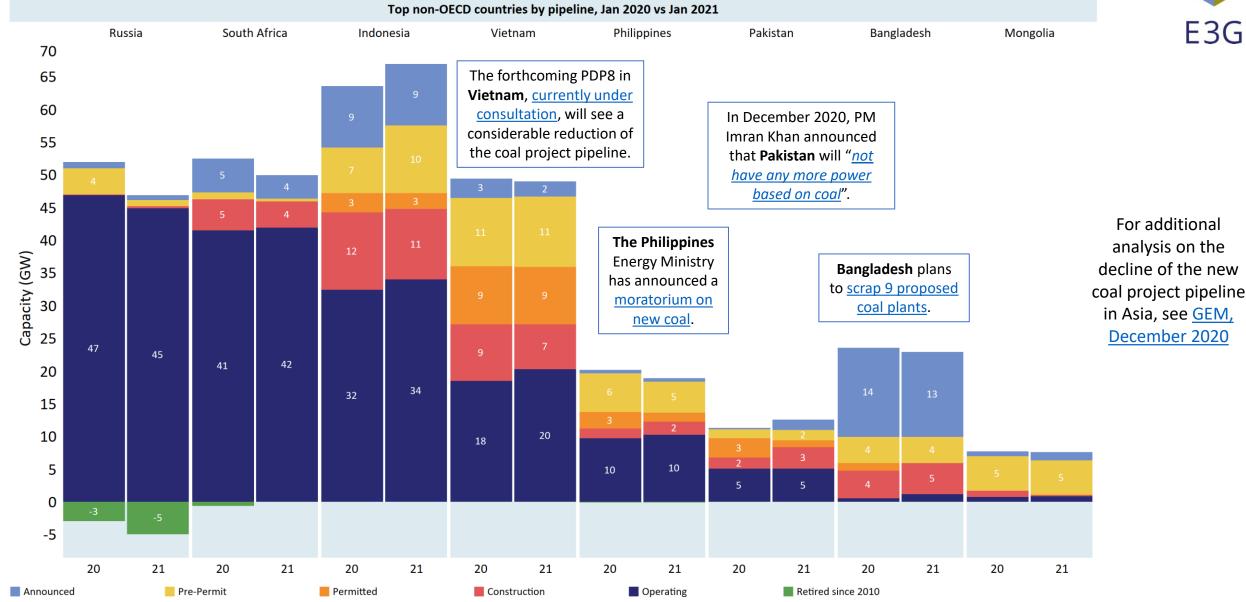




- India's coal power declined for second consecutive year in 2020.
- Tata Power says that <u>60 GW of coal</u> <u>plants can be shut</u> <u>down</u>.
- A number of major Indian states <u>could</u> <u>soon declare 'no</u> new coal'.

Non-OECD governments are restricting new coal





Methodology, data sources, future updates



- Our analysis is based on a combination of publicly available data of operating and proposed coal power plants from <u>Global Energy Monitor</u> (aggregated from plant- to country-level); electricity generation data provided by <u>Ember</u>; and E3G analysis of political commitments and policy developments.
- Aggregating this data to the country level allows us to build a comparative picture of progress among economic peers and regional groupings.
- Unless otherwise stated, all data relates to the January 2021 release of Global Energy Monitor's Global Coal Plant Tracker and the Ember Electricity Review 2020, released in March 2020.
- This report is part of a bi-annual series of analysis of the global coal power landscape, prior versions of which are available here. Interactive online visualisations of the data within this report will also be available soon at www.e3g.org.



About E3G

E3G is an independent climate change think tank accelerating the transition to a climate safe world.

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