

# Boom and Bust 2018

## TRACKING THE GLOBAL COAL PLANT PIPELINE

Christine Shearer, Neha Mathew-Shah, Lauri Myllyvirta, Aiqun Yu, and Ted Nace



## ABOUT THE COVER

The cover shows the demolition of the cooling towers of High Marnham power station in Nottinghamshire, England. Photo copyright © by Richard Croft and licensed under this Creative Commons License: <http://bit.ly/2CQKoGw>



## ABOUT COALSWARM

CoalSwarm is a global network of researchers developing collaborative informational resources on fossil fuels and alternatives.

Current projects include the Global Coal Plant Tracker, the Global Fossil Projects Tracker (coal, oil, and gas infrastructure), the CoalWire newsletter, and the CoalSwarm and FrackSwarm wiki portals.



## ABOUT THE SIERRA CLUB

The Sierra Club is America's largest and most influential grassroots environmental organization, with more than three million members and supporters. In addition to helping people from all backgrounds explore nature and our

outdoor heritage, the Sierra Club works to promote clean energy, safeguard the health of our communities, protect wildlife, and preserve our remaining wild places through grassroots activism, public education, lobbying, and legal action.

## GREENPEACE ABOUT GREENPEACE

Greenpeace uses peaceful protest and creative communication to expose global environmental problems and to promote solutions that are essential to a green and peaceful future. With over 40 associated offices located throughout the world, Greenpeace works to protect our oceans and ancient forests, and to end toxic pollution, global warming, nuclear threats, and genetic engineering. Since 1971, Greenpeace has been the leading voice of the environmental movement by taking a stand against powerful political and corporate interests whose policies put the planet at risk. Greenpeace furthers its mission through research, advocacy, public education, lobbying, and litigation with a staff that includes scientists, lawyers, campaigners, policy experts, and communications specialists.

## ABOUT THE GLOBAL COAL PLANT TRACKER

The Global Coal Plant Tracker is an online database that identifies, maps, describes, and categorizes every known coal-fired generating unit and every new unit proposed since January 1, 2010 (30 MW and larger). Developed by CoalSwarm, the tracker uses footnoted wiki pages to document each plant and is updated biannually. For further details, see [Tracker Methodology](#) at EndCoal.org.

## AUTHORS

Christine Shearer is Senior Researcher for CoalSwarm. Neha Mathew-Shah is Campaign Representative for Sierra Club's International Climate Program. Lauri Myllyvirta is energy analyst at Greenpeace East Asia. Aiqun Yu is China Researcher for CoalSwarm. Ted Nace is Director of CoalSwarm.

## PRODUCTION

Design by Charlene Will. Additional design and page layout by David Van Ness.

## PERMISSIONS/COPYRIGHT

This publication may be reproduced in whole or in part and in any form for educational or nonprofit purposes without special permission from the copyright holders, provided that acknowledgement of the source is made. No use of this publication may be made for resale or other commercial purpose without the written permission of the copyright holders.

Copyright © March 2018  
by CoalSwarm, Greenpeace USA, and Sierra Club

## FURTHER RESOURCES

For additional data on proposed and existing coal plants, see [Summary Statistics](#) at EndCoal.org, which provides over 20 tables providing results from the Global Coal Plant Tracker (GPCT), broken down by province, nation, and region. For links to reports based on GPCT data, see [Reports](#) at EndCoal.org. To obtain primary data from the GPCT, contact Ted Nace ([ted@tednace.com](mailto:ted@tednace.com)).



GREENPEACE

# Boom and Bust 2018

TRACKING THE GLOBAL COAL PLANT PIPELINE

Christine Shearer, Neha Mathew-Shah, Lauri Myllyvirta, Aiqun Yu, and Ted Nace

---

## EXECUTIVE SUMMARY

For the second year in a row, all leading indicators of coal power capacity growth dropped steeply in 2017, including pre-construction planning, construction starts, and project completions, according to the Global Coal Plant Tracker. The decline was due primarily to central government restrictions in China and declining financial and policy support in India, although capacity under development in the rest of the world also declined.

Continuing the record pace of the past three years, global retirements during the year exceeded 25,000 megawatts (MW).

Key developments in 2017 included:

- A 28% year-on-year drop in newly completed coal plants; a 41% drop in the past two years.
- A 29% year-on-year drop in construction starts; a 73% drop in the past two years.
- A 22% year-on-year drop in pre-construction activity; a 59% drop in the past two years.

- A 23% drop in construction activity; a 38% drop in the past two years.
- A geographic narrowing of plant construction: only seven countries initiated construction at more than one location.
- A growing phase-out movement, supported by 34 countries and subnational entities

With declining deployment and high levels of retirement, coal power capacity is now caught in a squeeze: if current trends continue, by 2022 yearly retirements will exceed new capacity and the global coal fleet will begin to shrink.

While the prospect of an end to coal power expansion is a welcome development for climate and health, it is arriving late in the game relative to the stark imperatives of what is needed. In order to meet the goals of the 2015 Paris climate agreement, the current pace of progress must be accelerated, including canceling coal power projects under development and hastening retirement of aging coal fleets in Europe and the United States.

## SQUEEZE: FALLING CONSTRUCTION, RISING RETIREMENTS

For the global coal fleet to grow, annual building of new plants must exceed annual retirements, as has occurred over the past decade. But multiple indicators, including new plants commissioned, construction starts, and implementation rates, all point to a downturn in new coal power capacity. Meanwhile, the pace of retirements of older plants is steadily rising. As a result, coal power is caught in a squeeze. If current trends continue, by 2022 yearly retirements will exceed new capacity and the global coal power fleet will begin to shrink.

As shown in Table 1, all metrics of coal plant development activity show signs of decline. As of January 2018, these include:

- A 28% year-on-year drop in newly completed coal plants; a 41% drop in the past two years.
- A 29% year-on-year drop in construction starts; a 73% drop in the past two years.
- A 22% year-on-year drop in pre-construction activity; a 59% drop in the past two years.
- A 23% drop in construction activity; a 38% drop in the past two years.

Among these indicators, the level of construction starts provides a particularly useful way of predicting future deployment of new capacity, since it is both robust (construction starts are widely reported, require final regulatory approval, and represent large commitments of funds) and forward looking (construction requires two years in China and four years elsewhere).

Although ongoing construction is currently underway at 260 locations in 35 countries, construction starts are more geographically confined. During 2017, construction started at 62 locations in twelve countries, including 45 greenfield locations and 17 locations where existing power stations were adding units. The twelve countries where construction starts took place were Bangladesh, China, India, Indonesia, Japan, Mongolia, Pakistan, the Philippines, Poland, Russia, Senegal, and South Korea. Of these, only seven countries (Bangladesh, China, India, Indonesia, Japan, Pakistan, and South Korea) started construction at more than one location.

For charting the future of the coal fleet, even more useful than construction data alone is a combination of two indicators: construction starts and trends in the retirement of coal power capacity. As shown

**Table 1. Changes in the Global Coal Plant Pipeline from January 2016 to January 2018.**

	January 2016 (MW)	January 2017 (MW)	January 2018 (MW)	Change from January 2017 to January 2018	Change from January 2016 to January 2018
Announced	487,261	247,909	174,884	-29%	-64%
Pre-permit	434,180	222,055	168,127	-24%	-61%
Permitted	168,230	99,637	103,613	4%	-38%
Announced+ Pre-permit + Permitted	1,089,671	569,601	446,624	-22%	-59%
Started Construction (Past 12 Months)	169,704	65,041	45,913	-29%	-73%
In Construction	338,458	272,940	209,566	-23%	-38%
On Hold	230,125	607,367	634,777	5%	176%
Completed (Past 12 Months)	101,624	83,785	60,195	-28%	-41%
Operating	1,914,579	1,964,460	1,995,818	2%	4%

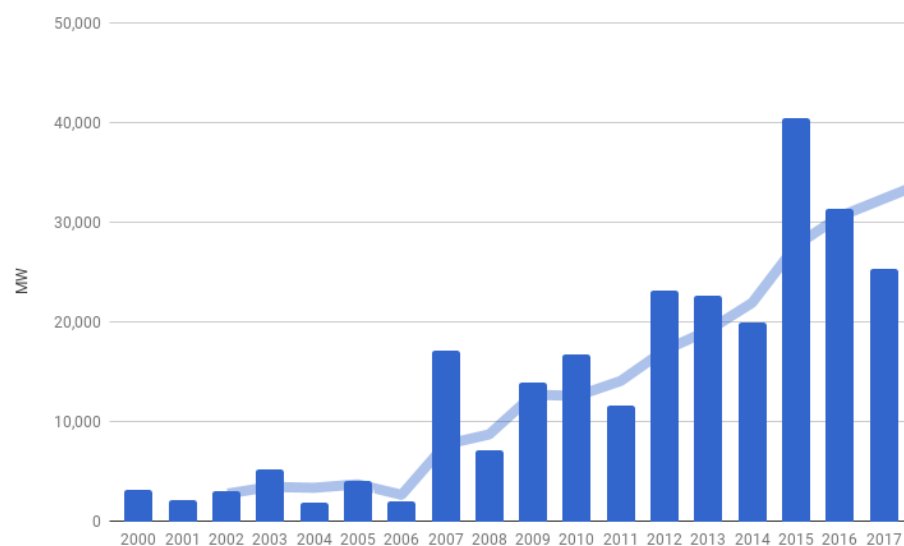
Source: CoalSwarm Global Coal Plant Tracker, January 2018. Includes units 30 MW and larger.

in Figure 1, the past two decades have seen a strong upward trend in coal plant retirements, with 97,193 MW retired over the past three years (2015–2017), 65,877 MW over the previous three years (2012–2014), and 42,334 MW in the three-year period prior to that (2009–2011).

Because the growth in coal plant retirements is fundamentally driven by the demographics of the rapidly aging coal fleets of Europe, the United States, and other long-industrialized countries (see Figure 2), it

is unlikely to be deeply affected by policies aimed at propping up coal. Already, 290,130 MW of the global coal fleet has passed the weighted mean life expectancy (39 years, according to the Global Coal Plant Tracker) and an additional 315,580 MW of currently operating coal plants will do so by 2030.<sup>1</sup> While it is not possible to predict exactly what year the level of old plant retirements will surpass the level of newly operating plants, current trends indicate that retirements will exceed additions by 2022; at that point, the global coal fleet will begin to shrink.

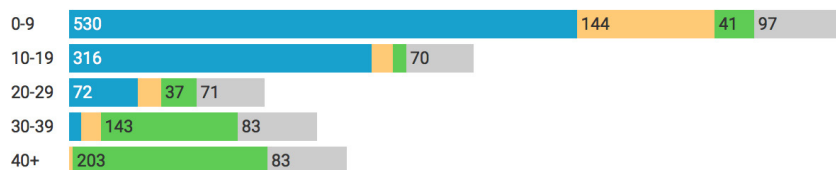
**Figure 1. Global Coal Power Retirements 2000–2017, Yearly and Three-Year Moving Average (MW)**



Sources: 2000–2010 Platts WEPP; 2011–2017 CoalSwarm Global Coal Plant Tracker. Global Coal Plant Tracker data includes units 30 MW and larger.

**Figure 2. Coal Power Capacity by Age and Region (GW)**

China = blue, India = yellow, US/EU28 = green, Rest of the World = grey



Source: CoalSwarm Global Coal Plant Tracker, January 2018. Includes units 30 MW and larger.

1. Similarly, Steven Davis and Robert Socolow reported the median retirement age of coal plants to be 37 years, based on their analysis of the Platts WEPP database. Davis and Socolow, "Commitment accounting of CO<sub>2</sub> emissions," *Environmental Research Letters* (2014)

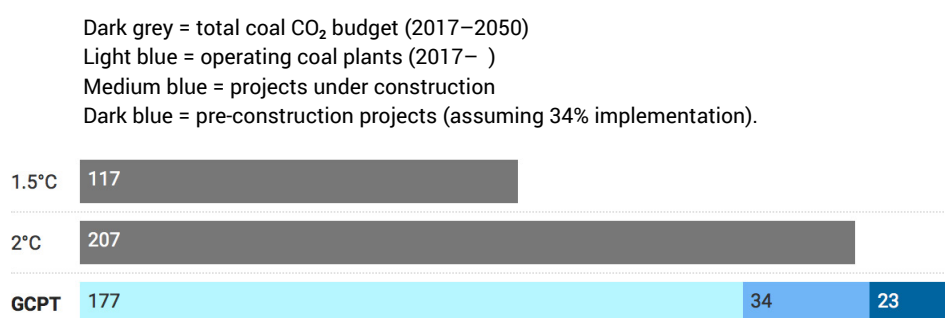
## CLIMATE IMPACT

As shown in Figure 3, lifetime carbon dioxide emissions from currently operating coal plants along with coal plants under construction and in pre-construction development far exceed the available carbon budgets for international climate goals at the current level of operating hours per year. The figure assumes that 34% of proposed coal plant projects will be

implemented, corresponding to the average rate in the 2010–2017 period (see Table 2), and that the plants will be retired at age 40 (or in five years if already 40 or older). As calculated by [Climate Analytics](#) (2016), the global coal plant budgets from 2017 to 2050 for 1.5°C and 2.0°C are 117 and 207 Gigatonnes (Gt), respectively.

**Figure 3. Global Coal Power Emissions Compared to Coal Carbon Dioxide Budgets (Gigatonnes)**

40-year lifetime for coal plants, 52.5% average capacity factor (IEA 2017)



Source: CoalSwarm Global Coal Plant Tracker, January 2018. Includes units 30 MW and larger. Coal plant emissions estimated from the Global Coal Plant Tracker (GCPT). Carbon budgets for coal plants developed by Climate Analytics (2016).

**Table 2. Coal Plant Implementation Rate by Region, 2010–2017**

	MW		%	
	Implemented (operating or in construction)	Halted (cancelled or shelved)	Implemented (operating or in construction)	Halted (cancelled or shelved)
East Asia	533,732	758,814	41%	59%
South Asia	187,443	578,957	24%	76%
SE Asia	70,107	95,902	42%	58%
non-EU Europe	9,608	64,373	13%	87%
Africa and Middle East	15,297	40,724	27%	73%
Eurasia	5,667	22,494	20%	80%
EU28	24,770	71,644	26%	74%
Latin America	9,967	23,662	30%	70%
Canada/US	16,659	29,668	36%	64%
Australia/NZ	144	8,956	2%	98%
<b>Total</b>	<b>873,394</b>	<b>1,695,194</b>	<b>34%</b>	<b>66%</b>

Source: CoalSwarm Global Coal Plant Tracker, January 2018. Includes units 30 MW and larger.

The sum of all carbon dioxide emissions from coal plants operating and under development is 233 Gt, higher than the budgets for 1.5°C and 2.0°C. In order to meet the 1.5°C budget, all current development of coal plants must be cancelled and much of the current fleet must be retired before plants reach 40 years of age. Even the less ambitious 2.0°C budget requires much higher cancellation rates for coal plants in planning and construction, and accelerated retirement of coal plants 40 years of age or older.

As shown in Figure 2, most of the 290 GW of global coal plants 40 years of age and older are located in the United States (144 GW, or 50%) and the European

Union (59 GW, or 20%). To meet international climate goals, the retirement of these aging plants must be accelerated. Toward that end, a positive development in 2017 was increasing momentum for a coal phase-out. To date, at least 34 countries and subnational entities have committed to phasing out existing coal plants and placing a moratorium on new coal plants that lack carbon capture and storage, and at least 127 businesses have made a commitment to go 100% renewable (RE100), and 24 businesses and other organizations have committed to powering their operations without coal. (Powering Past Coal Alliance 2017, RE100)

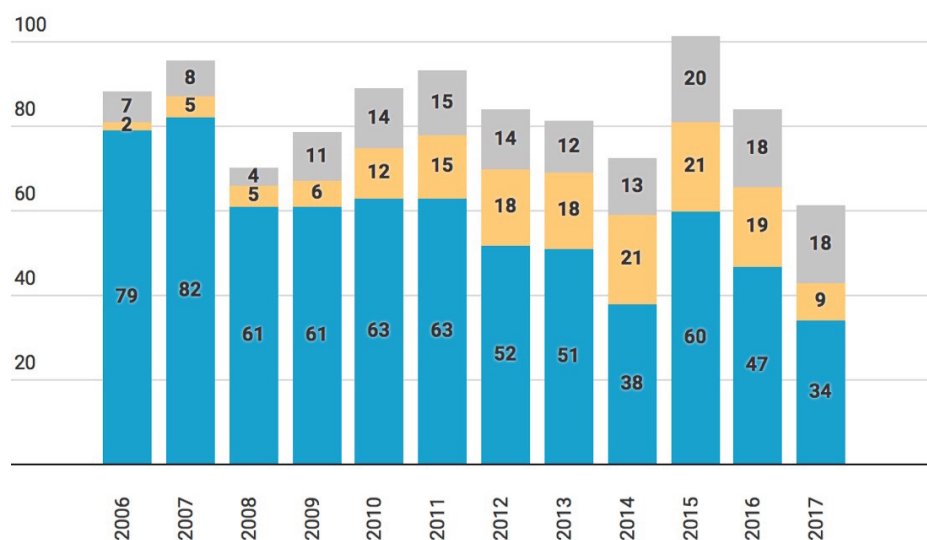
## REGIONAL AND COUNTRY NOTES

As shown in Figure 4, China and India have dominated the development of new coal power capacity over the past decade. In 2017, both China and India showed declines, leaving other countries with a larger proportional share of overall newly operating capacity.

While much of the decrease in the coal power pipeline has occurred in China and India, Figure 5 shows that the coal power pipeline is shrinking in the rest of the world as well. Outside China and India, total coal power capacity in pre-construction and construction dropped 6% in the past year and 26% in the past two years.

**Figure 4. Newly Operating Coal Power Capacity By Year (Gigawatts)**

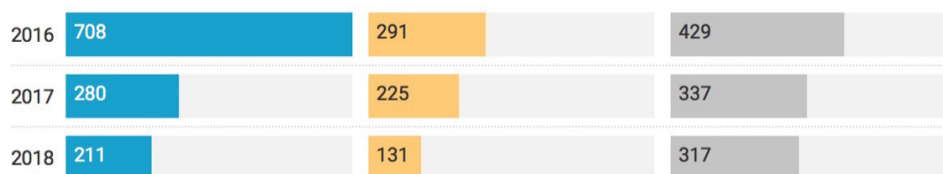
China = blue, India = yellow, Rest of the world = grey.



Source: CoalSwarm Global Coal Plant Tracker, January 2018. Includes units 30 MW and larger.

**Figure 5. Coal Power Capacity in Pre-Construction and Construction, January 2016 to January 2018 (Gigawatts)**

China = blue, India = yellow, Rest of the world = grey.



Source: CoalSwarm Global Coal Plant Tracker, January 2018. Includes units 30 MW and larger.



As shown in Table 3, coal plants are under active development (construction and pre-construction) in 60 countries. Of these, 15 countries account for 90% of active development. The following is a country-by-country analysis of a dozen hot-spot countries, as well as the United States and the European Union.

**China:** From 2006 to 2017 China commissioned 692 GW of coal-fired capacity, more than twice the amount commissioned in the rest of the world combined. The rapid expansion coupled with a 2015 to 2016 spurt in provincial coal permitting is now competing with the country's ambitious renewable goals, leading to a power overcapacity crisis.

In response, the central government began restricting new coal plants in 2016, including restricting permitting in nearly every province (with exceptions for projects located in impoverished areas and for residential heat and power projects). In 2017 the central government began suspending hundreds of coal projects by name, with 98 GW shelved in January and 93 GW in September (and 21 GW of overlap).

Altogether, the 2016–2017 restrictions have effectively led to the suspension of an estimated 444 GW of coal-fired capacity under various stages of development in China. While over 16 GW of coal projects appear to be advancing in violation of the restrictions, the measures have radically slowed China's coal plant pipeline, from 708 GW under active development (pre-construction and construction) in 2015, to 211 GW under active development in 2017. Newly commissioned coal plants have dropped from a 2006-to-2015 average of 61 GW per year to 47 GW in 2016 and 34 GW in 2017.

Despite the suspensions, China continues to lead the world in the amount of coal power capacity under development, with 116 GW of pre-construction capacity and 95 GW under construction. Additionally, 37 GW of proposals have been suspended by restrictions that end in 2017, and many of the remaining suspensions end in 2020, raising questions around whether the suspended projects will resume active development. Analyses by [Greenpeace](#) (2016a) and [Carbon Tracker](#) (2016) have found the country's existing coal plants already far exceed domestic power needs, with

additional coal plants representing potentially billions of dollars of wasted capital.

Internationally, Chinese financial institutions are the world's largest funder of overseas coal plants, investing US\$15 billion in coal projects from 2013 to 2016 through international development funds, with another US\$13 billion in proposed funding (NRDC 2017). CoalSwarm estimates Chinese firms are involved in the construction, ownership, or financing of at least 16% of all coal-fired power stations under development outside China.

**India:** Perhaps no country better exemplifies the rapidly changing energy economic landscape than India. The country added 152 GW of coal power capacity from 2006 to 2017, second only to China. Yet renewable energy costs have [fallen 50%](#) in two years (BNEF 2017), and in financial year 2016–2017, India for the first time added more renewable energy capacity than thermal power capacity. A [recent analysis](#) (Greenpeace 2017) found that 65% of the country's existing coal power capacity is not competitive compared to new tariff bids for solar and wind power.

In response, private capital is rapidly withdrawing from coal power projects. All of the 6,920 MW that entered construction in 2017 was sponsored by state-owned entities with public funding. Facing economic pressure, about [16 GW](#) of India's operating coal plants currently lack a power purchase agreement, while over [17 GW](#) are frozen in construction, primarily due to a lack of financing. Prospects for future coal power are also dimming: the country's draft 2016 National Electricity Plan calls for rising demand to be met with 275 GW total renewable energy capacity by 2027, with no coal plants needed beyond those under construction.

There is also pressure on the country's operating coal fleet to lower air pollution emissions. A recent [report](#) (Greenpeace 2016b) identified air pollution hotspots in India visibly linked to coal plant clusters. In 2017 the Ministry of Power [reported](#) that 89% of existing coal plant capacity, or 166GW, was not in compliance with the country's sulphur dioxide emission limits. More than 300 coal plants nationwide missed their

December 7, 2017 deadline to install pollution controls, leading to a [legal battle](#) over when the plants will comply with the law.

**Vietnam:** Vietnam continues to be a hotspot for coal power. Although no coal plants entered construction in 2017, large numbers of proposed projects are in active development. Guided by the country's National Power Development Plan VII, revised in 2016, the country has 12,100 MW of announced projects, 15,040 MW in pre-permit development, 8,750 MW permitted, and 10,635 MW under construction. These projects are largely driven by overseas finance from China, Japan, and South Korea, according to a [GreenID report](#) (Vietnam Investment Review 2017). Recently, the US Export-Import Bank application for the Long Phu-1 coal project was withdrawn. Although solar and wind power have lagged in Vietnam, especially in comparison to China and India, a boom in renewable power may be in the offing. Due to its extensive coastline, Vietnam enjoys a high potential for wind power, and numerous projects have been undertaken in the southern coastal provinces of Binh Thuan, Soc Trang, Bac Lieu, and Ca Mau. Solar projects are similarly concentrated in coastal areas but are also found at inland provinces such as Dong Nai.

**Turkey:** Although no coal plants entered construction in 2017, 1,300 MW of coal power capacity is currently in ongoing construction at three locations. Turkey continues to have large numbers of coal power projects in pre-construction planning, including 15,410 MW announced, 19,001 MW in pre-permit development, and 7,349 MW permitted. Most of these projects are a lingering result of the rush by numerous companies to propose coal plants under the country's shift toward privatizing its electricity markets. In the past several years, many have been abandoned, often in the face of strong opposition from local communities. Nevertheless, the government continues to press ahead with plans for a large expansion in coal power. Analysts have pointed out that rapidly falling prices of solar power, combined with Turkey's high solar potential, provide a more flexible and less risky approach to the country's energy strategy. (IEEFA 2016)

**Indonesia:** Since 2010, Indonesia has commissioned 17,673 MW of coal power capacity, and it currently has 12,015 MW under construction. Both numbers exceed the amounts in any country outside China and India. As part of its 2017–2026 energy plan, state-owned utility PLN has called for 24 GW of coal-fired capacity be supplied by independent power producers through 25-year guaranteed power purchase agreements, even if the power is not used. According to a [recent study](#) (IEEFA 2017), PLN projections greatly overestimate future demand growth, and at least nine coal projects should be cancelled to avoid locking the utility into uneconomic coal contracts for decades. In one sign that the government is beginning to rein in the unsustainable level of coal power expansion, Energy and Mineral Resources minister Ignasius Jonan said the government would no longer approve new coal plants on the island of Java, and the 2,000 MW [Jawa 5 coal plant](#) was cancelled.

**Bangladesh:** With nearly 18 GW of capacity in pre-construction development and over 4 GW under construction, Bangladesh remains a significant hotspot of coal power development. The bulk of these proposals include foreign assistance, most notably by banks in [China](#), whose companies and finance are involved in over half (12.5 GW, or 56%) of Bangladesh's in-development coal power capacity. Additionally, three coal import terminals are under construction. Proposed coal projects have encountered significant public opposition over land acquisition, leaving most of the plants [years](#) behind schedule.

**Japan:** Japan has commissioned 5 GW of coal-fired capacity since 2006, with another 13.5 GW currently proposed and 5 GW under construction. About 2.5 GW of proposed coal capacity was suspended in 2017, with no new coal proposals added. Civil society groups, Japan's Environment Minister, and an Advisory Panel to the Foreign Minister on Climate Change have [called on](#) the government to rethink its coal plans at home and abroad. (Advisory Panel 2017) Japan is the second biggest public financier of overseas coal-fired power capacity, with US\$[10 billion](#) (NRDC 2017) already invested in coal projects from 2013 to

2016 through international development funds, and another US\$9 billion of proposed funding.

**Egypt:** Despite the country's exceptionally high solar energy potential, four large coal projects are currently under consideration in Egypt: [Safaga power station](#) (2,000 MW), [Ayoum Moussa power station](#) (2,640 MW), [Marsa Matruh power station](#) (4,000 MW), and [Hamarawein IPP coal project](#) (6,000 MW). The Hamarawein project has recently advanced, with three international consortiums submitting bids and nine local banks announcing the intention to provide US\$1.5 billion in loans. Meanwhile, [bids](#) for large solar PV projects have been submitted in Abu Dhabi and the United Arab Emirates for US\$24.20/MWh and US\$29.90/MWh, much lower than levelized costs for coal power.

**Pakistan:** The amount of coal power capacity in Pakistan surged in 2017 with the commissioning of 2,260 MW of new plants. Previously, only 40 MW was built from 2006 to 2016. Pakistan has an additional 9.2 GW of proposed coal-fired capacity and 3.2 GW under construction. The country inaugurated its [first coal terminal](#) in 2017 at Port Qasim. Chinese technology and finance are at the center of Pakistan's coal plans, with Chinese firms involved in about half (6.3 GW) of the coal plants under development. Many of the coal proposals are part of the [China-Pakistan Economic Corridor](#), a multi-billion dollar plan that includes US\$33 billion in energy infrastructure projects, primarily fossil fuels.

**The Philippines:** In October, the growing potential for solar energy in the Philippines was [demonstrated](#) by a Meralco power purchase agreement (PPA) for solar power at US\$58 per MWh, half the cost of the company's PPAs for coal power. Nevertheless, the Philippines continues to have numerous coal projects under development, including 7,560 MW in pre-construction development and 4,581 MW in construction. However, only 105 MW of projects moved into construction in 2017, raising the likelihood that much of the pre-construction pipeline will not move to completion.

**South Africa:** Two more units of the 4,800 MW Medupi power station went into operation in 2017, bringing half of the plant to completion. 2,400 MW of coal power remains under construction at Medupi and 4,000 MW is under construction at the Kusile power station. An additional 5,540 MW is in pre-construction planning at eight locations, as part of the country's IPP Coal Program. With South Africa facing oversupply from the coal plants under development combined with the country's 42 GW of operating coal power capacity, a [recent study](#) (Meridian Economics 2017) found the country could save billions through the early decommissioning of old coal plants, the suspension of Kusile units 5 and 6, and the cancellation of new coal plants. In March 2017, the North Gauteng High Court ruled that a climate change assessment must be done prior to the authorization of the IPP Thabametsi power plant, casting doubt on the future of the KiPower and Colenso power stations.

**South Korea:** The country commissioned over 5 GW of coal-fired capacity in 2017 and 5 GW in 2016, amounts exceeded by only China and India in both years. Recently elected president Moon Jae-in has vowed to cease permitting new coal plants and to phase out old coal plants. While government leaders had proposed switching its current coal proposals to natural gas, South Korea's December 2017 energy plan proposed that only the 1,160 MW [Dangjin Eco power station](#) be changed to a gas-fired project, leaving 7,359 MW of coal-fired capacity under development. Yet the country also plans a fivefold increase in renewable installs to [58.5 GW](#) by 2030. Despite signs of a domestic policy shift toward renewables, South Korea remains a major source of finance for coal projects internationally, providing over [US\\$8 billion](#) for coal-fired power projects outside the country since 2008. (SFOC 2018)

**Thailand:** Strong public opposition has caused the postponement of plans for the 870 MW [Krabi power station](#) and the 2,200 MW [Thepha power station](#), leaving 4,656 MW of proposed capacity, none of which is permitted for construction. The only coal plant advancing in Thailand is a 600 MW replacement unit under construction at the [Mae Moh power station](#). In 2017 Prime Minister Prayut

Chan-o-cha proposed raising the target contribution for renewables from 33% to 40% in the country's Power Development Plan (2015–36).

**United States:** Despite pro-coal rhetoric and moves against environmental regulation by the Trump Administration, coal power capacity continued to decline in 2017, with numerous companies announcing plant retirements. As of the end of 2017, 266 coal plants had retired or committed to retirement, with 264 plants remaining in the U.S. coal fleet. The year 2017 also marked some major announcements of future retirements, including three heavily polluting Texas plants—[Monticello](#), [Big Brown](#), and [Sandow](#)—all of which have retired in the first few months of 2018. With no coal power under construction or active development, and retirement of 74 GW of coal power capacity since 2010, the United States is moving steadily away from coal.

**European Union:** As of February 2018, ten EU countries with coal-fired power capacity had ended coal use for power generation or had pledged to phase out it out by 2030: Austria, Belgium, Denmark, Finland, France, Italy, Netherlands, Portugal, Sweden, and the United Kingdom. In the UK, electricity provided by coal dropped from 45% of overall generation in 2012 to just [2% in 2017](#) (Carbon Brief 2016), with the country planning to retire its remaining 15.5 GW of coal-fired capacity by 2025. The Netherlands plans to retire its 5,860 MW of coal-fired capacity by 2030, including 3,500 MW commissioned recently in 2015–2016. While Germany has 50 GW of coal plant capacity and an additional 3,120 MW under development, the country plans to set an end date for coal use in 2019. Outside Germany, EU countries that continue to pursue new coal plants are the Czech Republic, Greece, Hungary, Poland, and Romania.

**Table 3. Coal Power Capacity in Development and Operating by Country (MW)**  
January 2018 (units 30 MW and larger)

Country	Pre-Construction	Construction	All Active Development	Shelved	Operating
China	116,175	94,828	211,003	435,162	936,057
India	87,731	43,628	131,359	82,355	214,910
Vietnam	35,890	10,635	46,525	2,800	14,971
Turkey	41,760	1,130	42,890	29,589	18,469
Indonesia	25,890	12,015	37,905	14,600	28,584
Bangladesh	17,883	4,115	21,998	4,085	250
Japan	13,596	4,979	18,575	1,300	44,578
Egypt	14,640	0	14,640	0	0
Pakistan	9,195	3,190	12,385	8,720	2,450
Philippines	7,560	4,581	12,141	1,694	7,206
South Africa	5,540	6,352	11,892	1,650	42,101
Poland	5,700	3,390	9,090	0	29,401
Thailand	4,656	600	5,256	3,070	5,457
Mongolia	6,830	835	7,665	1,350	706
South Korea	2,100	5,259	7,359	3,660	37,973
Zimbabwe	6,650	0	6,650	1,800	950
United Arab Emirates	3,000	2,400	5,400	270	0
Bosnia & Herzegovina	4,080	0	4,080	0	2,073
Cambodia	3,190	135	3,325	1,200	370
Germany	2,020	1,100	3,120	0	50,400

**Table 3. Coal Power Capacity in Development and Operating by Country (MW) (continued)**

<b>Country</b>	<b>Pre-Construction</b>	<b>Construction</b>	<b>All Active Development</b>	<b>Shelved</b>	<b>Operating</b>
Brazil	2,566	340	2,906	600	4,355
Serbia	2,850	0	2,850	0	4,405
Taiwan, China	2,049	800	2,849	7,600	18,207
Malawi	2,820	0	2,820	700	0
Malaysia	0	2,600	2,600	0	11,008
Botswana	2,400	132	2,532	1,804	600
Mozambique	2,440	0	2,440	1,620	0
Myanmar	2,030	0	2,030	10,430	160
Tanzania	1,890	0	1,890	0	0
Oman	1,800	0	1,800	0	0
Morocco	350	1,386	1,736	0	2,585
Ukraine	1,320	0	1,320	600	23,259
Nigeria	1,200	0	1,200	2,000	0
Colombia	900	250	1,150	0	1,393
Greece	450	660	1,110	0	4,375
Kenya	1,050	0	1,050	130	0
Dominican Republic	0	770	770	0	305
Russia	480	240	720	226	48,690
Laos	700	0	700	626	1,878
Ghana	700	0	700	1,400	0
Ivory Coast	700	0	700	0	0
Czech Republic	0	660	660	0	9,052
Iran	0	650	650	0	0
Kazakhstan	0	636	636	0	12,000
Romania	600	0	600	0	5,115
Niger	600	0	600	0	0
Kosovo	500	0	500	0	1,290
Hungary	500	0	500	0	1,274
FYROM	429	0	429	0	800
Chile	0	375	375	2,135	5,101
Panama	0	320	320	0	0
Zambia	300	0	300	600	330
Tajikistan	300	0	300	0	100
Georgia	300	0	300	0	0
Kyrgyzstan	0	300	300	1,200	840
Montenegro	254	0	254	0	225
Senegal	0	125	125	600	30
Argentina	0	120	120	0	470
Madagascar	60	0	60	0	120
Jordan	0	30	30	0	0

**Table 3. Coal Power Capacity in Development and Operating by Country (MW) (continued)**

Country	Pre-Construction	Construction	All Active Development	Shelved	Operating
United States	0	0	0	1,295	278,823
Australia	0	0	0	2,666	24,872
United Kingdom	0	0	0	0	15,508
Spain	0	0	0	0	10,601
Canada	0	0	0	1,000	9,743
Italy	0	0	0	490	9,180
Hong Kong, China	0	0	0	0	6,608
Mexico	0	0	0	0	5,351
Bulgaria	0	0	0	0	5,059
Israel	0	0	0	0	4,900
Netherlands	0	0	0	0	4,837
North Korea	0	0	0	300	3,500
France	0	0	0	0	3,392
Denmark	0	0	0	0	2,805
Uzbekistan	0	0	0	300	2,522
Finland	0	0	0	0	2,202
Portugal	0	0	0	0	1,978
Moldova	0	0	0	0	1,610
Slovenia	0	0	0	0	1,469
Ireland	0	0	0	0	915
Slovakia	0	0	0	0	913
Sri Lanka	0	0	0	1,200	900
Guatemala	0	0	0	0	887
Austria	0	0	0	0	635
New Zealand	0	0	0	0	500
Croatia	0	0	0	0	335
Sweden	0	0	0	0	252
Mauritius	0	0	0	0	195
Peru	0	0	0	0	139
Namibia	0	0	0	0	120
Reunion	0	0	0	0	96
Syria	0	0	0	0	60
Guadeloupe	0	0	0	0	38
Venezuela	0	0	0	1,000	0
Swaziland	0	0	0	200	0
Democratic Republic of Congo	0	0	0	500	0
Guinea	0	0	0	250	0
<b>Total</b>	<b>446,624</b>	<b>209,566</b>	<b>656,190</b>	<b>634,777</b>	<b>1,995,818</b>
<b>China &amp; India</b>	<b>203,906</b>	<b>138,456</b>	<b>342,362</b>	<b>517,517</b>	<b>1,150,967</b>
<b>Rest of the World</b>	<b>242,718</b>	<b>71,110</b>	<b>313,828</b>	<b>117,260</b>	<b>844,851</b>

## CONCLUSION: AN ACCELERATING TRANSITION

As the sudden contraction of the coal plant pipeline over the past two years demonstrates, economic transitions are not linear propositions, especially when they are the result of a convergence among multiple political and economic drivers. In the case of the shift away from coal, these drivers include the fall in the cost of renewable energy, the pace of which has exceeded even optimistic predictions; a gathering movement among countries, states, cities, and businesses to phase out coal use; the pressure to deal with degraded urban air quality, especially in the major cities of East and South Asia; the increasing reluctance by banks and other financiers of coal plants to risk

large amounts of capital on potential stranded assets; and ongoing resistance by local communities to the impacts of coal plants, mines, and infrastructure. Together with growing retirements from aging coal fleets in North America, Europe, and other long-industrialized countries, these multiple factors are ending the era of coal power expansion and signaling the beginning of a global phase-out of the coal fleet. Yet despite the speed of change so far, the pace must be quickened, including increased cancellation of coal projects and accelerated retirements, if we are to meet international goals for a livable climate.

## REFERENCES

- BNEF (2017). “India’s Clean Energy Transition.” <http://bit.ly/2GDYoWv>
- Carbon Brief (2016). Simon Evans. “Two Charts Show How UK Coal Use Is Collapsing.” <http://bit.ly/2HICeUj>
- Carbon Tracker Initiative (2016). Matthew Gray. “Chasing the Dragon? China’s coal overcapacity crisis and what it means for investors.” <http://bit.ly/2HLwt8w>
- Climate Analytics (2016). Marcia Rocha et al. “Implications of the Paris Agreement for Coal Use in the Power Sector.” <http://bit.ly/2HG8Xto>
- Advisory Panel to the Foreign Minister of Japan (2017). “Promote new diplomacy on energy through leading global efforts against climate change” (provisional translation). <http://bit.ly/2HK4bLw>
- Greenpeace (2016a). Lauri Myllyvirta and Xinyi Shen. “Burning Money.” <http://bit.ly/2HFEkV3>
- Greenpeace (2016b). Lauri Myllyvirta, Sunil Dahiya, and Nandikesh Sivalingam. “Out of Sight: How coal burning advances India’s air pollution crisis.” <http://bit.ly/1Wd2s54>
- Greenpeace (2017). “Uncompetitive: Coal’s cost disadvantage grows as renewable tariffs plummet.” <http://bit.ly/2HL25e6>
- IEA (2017). World Energy Outlook. <http://bit.ly/2HLIk6f>
- IEEFA (2016). “Turkey at the Crossroads.” <http://bit.ly/2HFOwwF>
- IEEFA (2017). Yolanda Chung. “Overpaid and Underutilized: How capacity payments to coal-fired power plants could lock Indonesia into a high-cost electricity future.” <http://bit.ly/2HIBcrp>
- Meridian Economics (2017). Grové Steyn, Jesse Burton, and Marco Steenkamp. “Eskom’s Financial Crisis and the Viability of Coal-Fired Power in South Africa.” <http://bit.ly/2HJe4cv>
- NRDC (2017). Han Chen and Jake Schmidt. “Power Shift: Shifting G20 international public finance from coal to renewables.” <http://on.nrdc.org/2HIIpry>
- Powering Past Coal Alliance (2017). “Declaration.” <http://bit.ly/2HDN7qh>
- RE100. “Companies.” <http://there100.org/companies>
- SFOC (2018). Joojin Kim and Soyoung Lee. “Financing Dirty Energy: How Korean Public Financial Institutions Support Coal Power.” <http://bit.ly/2HL1FHh>
- Vietnam Investment Review (2017). “China funds coal away from home.” <http://bit.ly/2HGbvaw>