China at a Crossroads:

Continued Support for Coal Power Erodes Country's Clean Energy Leadership

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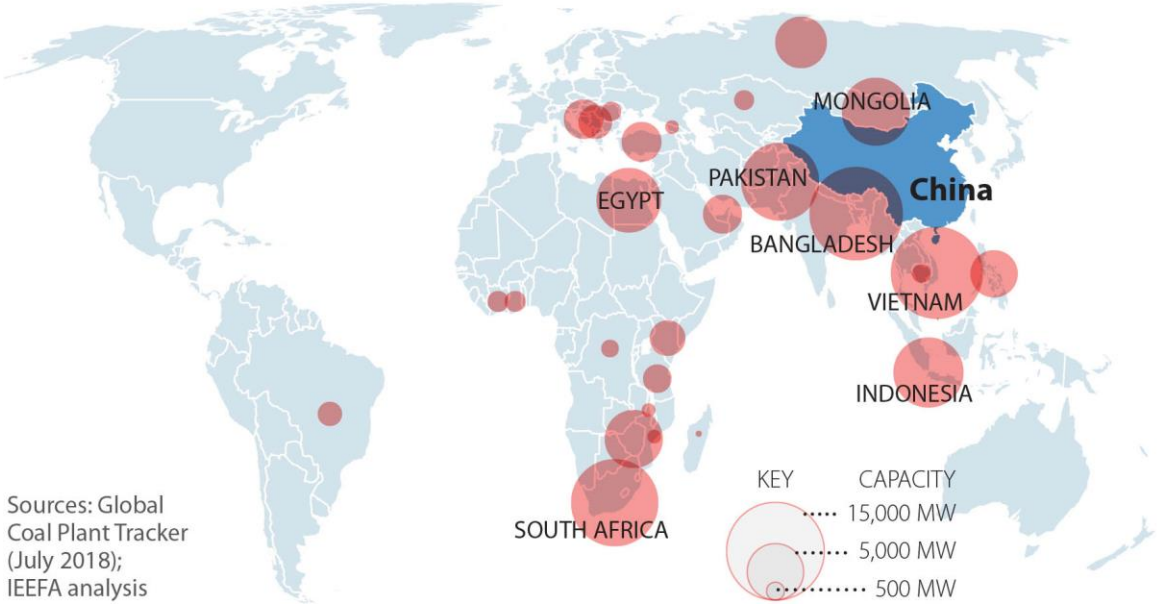
Executive Summary

China was among the top global lenders in outbound clean energy investments in 2017, establishing itself as a world leader in driving a domestic decarbonisation agenda. Yet financing for clean energy exists in tension with the country's continued investments in fossil fuels, particularly coal.

China a significant financing source for coal-plant projects globally

China has committed or proposed about $36 billion in financing for 102 gigawatts of coal-fired capacity in 23 countries. That represents more than a quarter of all coal-fired capacity under development outside of China.



Sources: Global Coal Plant Tracker (July 2018); IEEFA analysis

China is still fuel-source agnostic in international markets, effectively exporting its now increasingly redundant thermal power capacity and expertise. A unit-by-unit analysis of all global coal plants under development, based on the July 2018 Global Coal Plant Tracker, shows Chinese finance playing an increasingly significant role in supporting and funding new coal plants in international markets. Of the 399 gigawatts (GW) of coal plants currently under development outside China, Chinese financial institutions and corporations have committed or offered funding for over one-quarter of them (102GW).

This funding comes as financial institutions around the world are moving away from coal, including the World Bank, most multilateral development banks, and the export credit agencies (ECAs) of the Organisation for Economic Co-operation and Development (OECD) countries. Additionally, many private global financial leaders have come to see thermal coal as a poor investment with growing stranded asset risks (e.g. Standard Chartered UK, Generali of Italy, and Nippon Life of Japan, among others).

While the Chinese government has signalled it will restrict coal lending, the country has yet to formally limit its investment in coal plants. Instead, Chinese finance is increasingly stepping in as the lender of last resort for coal plants, as other banks take active measures to restrict their funding.

Among Our Key Findings:

- US$21.3 billion has been committed to over 30GW of coal-fired capacity across twelve countries, and an additional US$14.6 billion has been proposed in funding for over 71GW across 24 countries, adding up to US$35.9 billion in funding for 102GW of coal plant projects over 27 countries in total.

- The country with the most coal-fired capacity supported by Chinese finance is Bangladesh, followed by Vietnam, South Africa, Pakistan, and Indonesia. About 76GW of the 102GW of capacity is in pre-construction status.

- The 102GW of coal proposals account for over one-quarter (26%) of global coal-fired capacity under development outside China, and over one-third (35%) of coal development outside China and India.

- Many of the coal plant proposals involve larger projects around expensive imported coal terminals or domestic coal mining with dedicated rail infrastructure, creating a costly, long-term structural dependence on coal precisely at a time when electricity costs from renewable power generation are falling below coal power.

- Chinese companies often act as engineering, procurement, and construction (EPC) contractors for the projects, and increasingly as co-managers and owners as well, highlighting the importance the central government now places on the financial returns associated with large project development. Of the 102GW of global coal-fired capacity supported by Chinese finance, 30GW involves joint ownership with Chinese corporations.

- China's role as coal financier and developer primarily involves state-owned enterprises, with little involvement from private entities. The biggest lenders are Chinese policy banks: China Development Bank and the China Export-Import Bank, followed by Chinese state-owned commercials banks such as the Bank of China (BOC) and the Industrial and Commercial Bank of China (ICBC). The corporations most involved are large state-owned entities, including utility monopoly State Grid Corporation of China, infrastructure group China Energy Engineering Corporation, and power giants State Power Investment Corporation and China Huadian Corporation.

- Most of the capacity under development is categorized as ultra-supercritical technology (38%), followed by supercritical (35%) and subcritical (23%). This compares with subcritical technology making up 58% of plants funded by Chinese policy banks between 2001 and 2016. Yet Chinese finance still supports a high number of subcritical and supercritical plants, lagging the norms in carefully regulated markets.

Funding of these projects leaves China increasingly isolated as other nations move away from supporting coal. While Japanese and South Korean finance are the second and third highest supporters of coal plants globally, Japan's prime minister and national power giant Marubeni have stated publicly their intention to transition away from thermal coal, along with Japanese insurers Dai-ichi Life and Nippon Life, while South Korea is no longer permitting new coal plants and is increasing coal taxes in a deliberate turn toward renewables. In terms of

international financing for future coal plants by state-owned policy banks, China is by far the leader with 44GW[1] of capacity, followed by South Korea with 14GW and Japan with 10GW.

IEEFA notes China should reconsider its funding for export coal mines, coal-fired power plants, and the associated rail and port infrastructure. The International Energy Agency (IEA) sees renewables contributing 60% of global additions to electricity generation capacity through 2022 and dominating over the next two decades. Already, IEEFA estimates the Chinese Belt and Road Initiative (BRI) has driven US$8 billion of solar equipment exports from China, helping China become the number one exporter of environmental goods and services, overtaking the U.S. and Germany. It makes sense for China to continue to build on its position as the global leader in renewable energy development as the world moves away from fossil fuel-based capacity.

[1] Of the proposed funding for 71GW of coal plant projects, 44GW represents funding from just state-owned policy banks.

Introduction

China was the top global investor in clean energy investments in 2017, accompanying a record-setting year for renewable installation in the country. The Chinese government also invested a record US$44 billion in overseas low-carbon energy projects in 2017, and US$32 billion in 2016.[2] Yet financing for clean energy exists in tension with the country's fossil fuel investments, including mining, drilling, and power generation.

Coal plants in particular remain a large investment for China, with recent studies identifying China as one of the top funders of coal plants in the world. Chinese-led policy banks have financed nearly 60 completed and under construction coal-fired power plants across the globe since 2001, totalling over US$40 billion in financing.[3] [4] From 2013 to 2016, the five biggest Group of Twenty (G20) coal plant financiers were located in China, totalling US$15 billion in financing.[5]

International energy funding from China has been increasing under its Belt and Road Initiative (BRI), in which China is offering to develop infrastructure worth an estimated US$6 trillion across 68 economically-diverse countries in Asia, Europe, and Africa. Although BRI is technology-agnostic, most Chinese finance under BRI to date has gone to fossil fuels: of the US$51.2 billion spent on electric power generation and transmission from 2014-2017, 36% (US$18.2 billion) was spent on coal. In comparison, 11% (US$5.9 billion) was spent on solar and wind energy.[6] Most of China's foreign investment in renewables has been outside BRI countries.[7]

The Chinese government has identified coal plant construction and operation as a strategic investment for international development and state support for the country. It is a sector through which Chinese technology, equipment, and services can be exported, particularly as domestic deployments taper off. Under this model, financing is often contingent on business deals for Chinese companies, allowing the Chinese government to prop up its declining domestic coal industry by subsidising its development overseas. Notably, while China's state-owned enterprises remain heavily concentrated in coal, private sources of BRI finance from China are far more active in renewables. This suggests market signals are increasingly directing investments to climate-friendly sectors,[8] which the central government ignores by concentrating its state-owned entities on coal investments.

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[2] IEEFA, "China 2017 Review: World's Second-Biggest Economy Continues to Drive Global Trends in Energy Investment", January 2018.
[3] Center for International Environment and Resource Policy, The Fletcher School, Tufts University, "Policies Governing China's Overseas Development: Finance Implications for Climate Change", March 2018.
[4] Energy Policy, "Energizing development finance? The benefits and risks of China's development finance in the global energy sector", Volume 122, November 2018, Pages 313-321.
[5] NRDC, "G20 Countries' Public Coal Financing Reaches Five-Year High", 8 February 2018.
[6] World Resources Institute, "Will China Seize the Biggest Green Opportunity of the Coming Decade?", 8 November 2018.
[7] IEEFA, "China 2017 Review: World's Second-Biggest Economy Continues to Drive Global Trends in Energy Investment", January 2018.
[8] World Resources Institute, "Will China Seize the Biggest Green Opportunity of the Coming Decade?", 8 November 2018.

This funding for coal comes as financial institutions around the world are moving away from thermal coal. In 2013, the World Bank decided to limit its investments in coal-fired power plants, and with its exit from the increasingly controversial Kosovo coal power plant project as of October 2018, the Bank has no more coal plants in its portfolio of investments. The European Union (EU), United States (U.S.), and most multilateral development banks have progressively followed suit by restricting or ending their coal lending, including the European Bank for Reconstruction and Development. In 2015, export credit agencies (ECAs) within the Organisation for Economic Co-operation and Development (OECD) agreed to limit the types of coal-fired power plants that could be financed to those that meet carbon dioxide (CO2) performance requirements, and many private financial institutions have decided to limit their coal funding. A survey of international coal financing by state-owned policy banks finds China is by far the largest supporter of future coal plants abroad with 44GW of capacity, followed by South Korea with 14GW and Japan with 10GW.[9]

The Chinese government has signalled it will restrict its coal lending, stating as part of the 2015 U.S.-China Joint Statement on Climate Change that "China will strengthen green and low-carbon policies and regulations with a view to strictly controlling public investment flowing into projects with high pollution and carbon emissions both domestically and internationally". However, the country has yet to formally limit its investment in coal plants. As a result, Chinese finance appears to be increasingly stepping in as the lender of last resort for coal plants, as other financial institutions restrict their funding for projects with high carbon emission risks.

[9] Global Coal Finance Tracker, July 2018 data.

Chinese Financing of Coal

A unit-by-unit analysis of all coal plants under development across the globe, based on the July 2018 Global Coal Plant Tracker, shows Chinese finance playing a significant role in supporting and funding new coal plants. Of all coal plants under development outside China (399 gigawatts (GW) as of July 2018), Chinese financial institutions and corporations have committed or offered funding for over one-quarter of them (102GW, or 26%).

To date US$21.3 billion has been committed to over 30GW of projects across thirteen countries. An additional US$14.6 billion has been proposed in funding for over 71GW of projects across 23 countries. (For proposed capacity with no dollar amount, it means funding has been proposed but the amount has not yet been decided or disclosed.) (See Figure 1)

Figure 1: Coal-fired Capacity Under Development with Chinese Finance (MW)

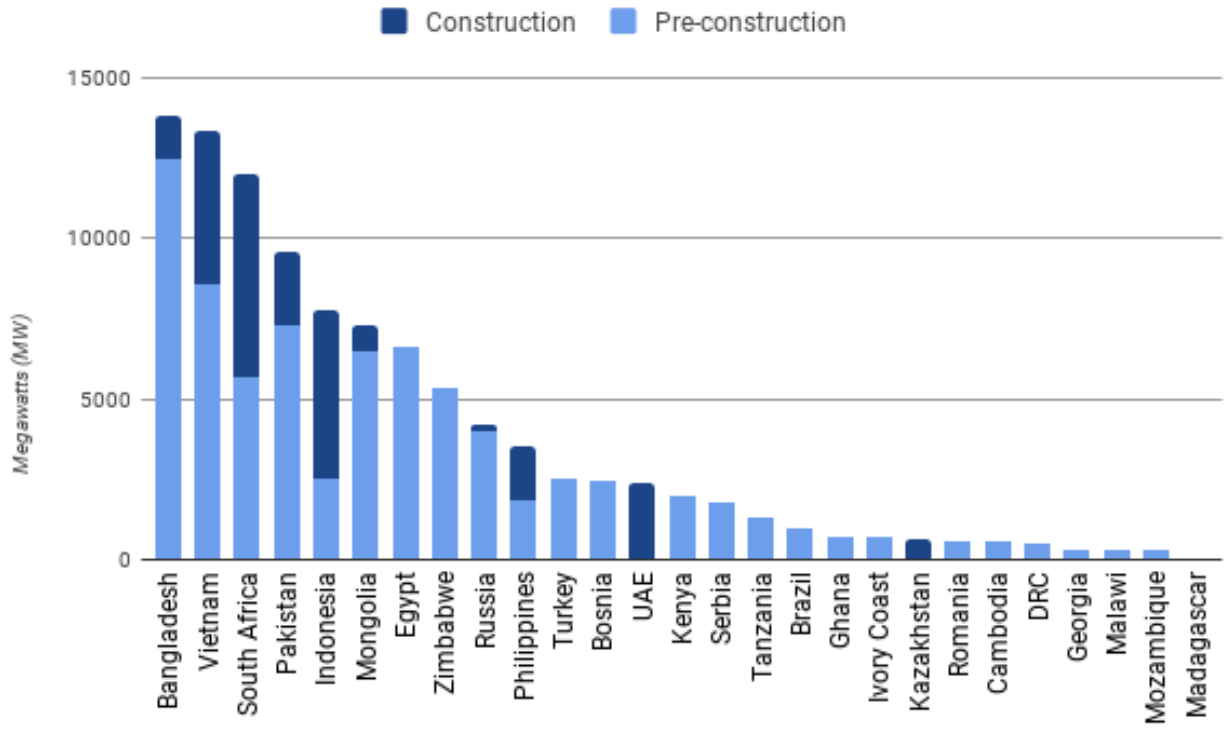


Figure 1 highlights most of the 102GW of capacity is located in Bangladesh, followed by Vietnam, South Africa, Pakistan, and Indonesia. About 76GW of the 102GW of capacity is in pre-construction status; of that 76GW, over 60GW is still trying to secure the permits needed to begin construction. Therefore, much of this capacity may eventually be cancelled, as only one GW of coal-fired capacity has been implemented for every two GW cancelled or shelved since 2010.[10] Borrowing for large coal plant development and coal imports carries inherent risks around exchange rate volatility, currency deficits and inflation, and rising interest rates, all of which can lead to unsustainable debt. Such currency and systemic

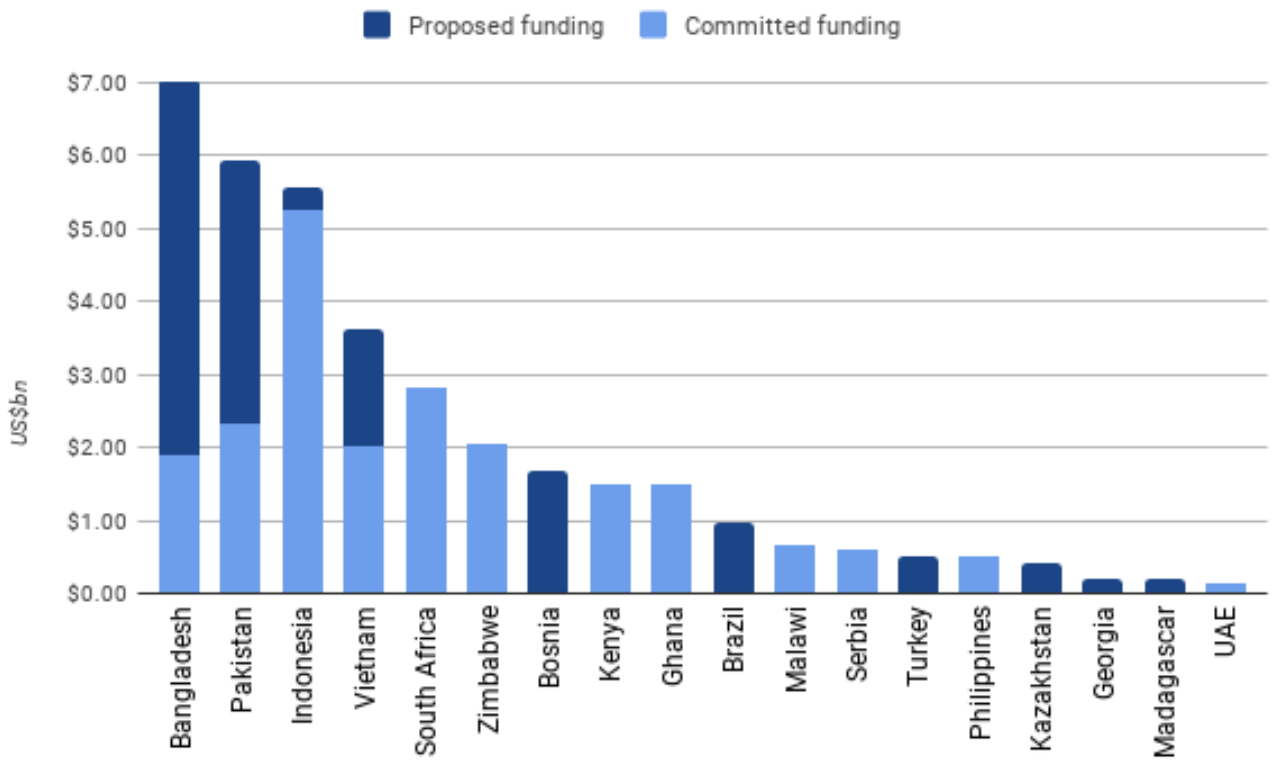
[10] "Boom and Bust 2018: Tracking the Global Coal Plant Pipeline", March 2018.

financial system default risks have been seen in Pakistan, Indonesia, and Turkey over 2018 alone.

Table 1: Committed and Proposed Chinese Finance for Coal Plants by Country

	Committed		Proposed		Total	
	Capacity (MW)	Amount (US$bn)	Capacity (MW)	Amount (US$bn)	Capacity (MW)	Amount (US$bn)
Bangladesh	1320	$1.900	12464	$5.150	13784	$7.050
Bosnia & Herzegovina	0		2480	$1.664	2480	$1.664
Brazil	0		940	$0.984	940	$0.984
Cambodia	540		0		540	
Democratic Republic of Congo	0		500		500	
Egypt	0		6600		6600	
Georgia	0		300	$0.200	300	$0.200
Ghana	700	$1.500	0		700	$1.500
Indonesia	6057	$5.255	1700	$0.318	7757	$5.573
Ivory Coast	0		700		700	
Kazakhstan	0		636	$0.400	636	$0.400
Kenya	1050	$1.500	960		2010	$1.500
Madagascar	0		60	$0.200	60	$0.200
Malawi	300	$0.667	0		300	$0.667
Mongolia	0		7280		7280	
Mozambique	0		300		300	$0.000
Pakistan	1980	$2.320	7600	$3.606	9580	$5.926
Philippines	2343	$0.493	1200		3543	$0.493
Romania	0		600		600	
Russia	0		4226		4226	
Serbia	350	$0.608	1450		1800	$0.608
South Africa	6352	$2.833	5650		12002	$2.833
Tanzania	0		1290		1290	
Turkey	0		2520	$0.500	2520	$0.500
United Arab Emirates	2400	$0.128	0		2400	$0.128
Vietnam	5580	$2.028	7800	$1.600	13380	$3.628
Zimbabwe	1370	$2.050	3960		5330	$2.050
Total	**30342**	**$21.282**	**71216**	**$14.622**	**101558**	**$35.904**

Figure 2: Proposed and Committed Chinese Finance for Coal Plants by Country (US$bn)



As figure 2 shows, Bangladesh also leads in proposed and committed funding, followed by Pakistan, Indonesia, Vietnam, and South Africa. However, Indonesia leads in funding that has already been committed or has reached financial close (light blue), followed by South Africa, Zimbabwe, Pakistan, and Vietnam, suggesting the capacity is more likely to be completed.

Most of the funding is provided by two Chinese policy banks: China Development Bank and the China Export-Import Bank, followed by Chinese state-owned commercial banks such as the Bank of China (BOC) and the Industrial and Commercial Bank of China (ICBC). The majority of the funding has yet to reach financial close (dark blue) and may therefore fall through or be cancelled.

The projects also often involve Chinese state-owned enterprises (SOEs) who construct the coal plants through engineering, procurement, and construction (EPC) contracts. The contracts may require a dominant or entirely Chinese workforce, restricting the local economic benefit of these mega-projects. China is reported to have 700,000 workers in Pakistan alone.[11]

SOEs are increasingly moving into larger roles around management and operation of the coal plants. Of the 102GW supported by Chinese finance, 30GW involve joint ownership arrangements with Chinese SOEs, and an additional 11GW are build-own-operate arrangements. The big players are all large SOEs, including the utility monopoly State Grid

[11] ETEnergyworld, "AP Explains: China's megaprojects fuel unease in Pakistan", 26 November 2018.

Corporation of China, infrastructure group China Energy Engineering Corporation, and power companies State Power Investment Corporation and China Huadian Corporation.

Figure 3: Coal-fired Capacity Under Development with Chinese Finance Compared to Total Capacity Under Development (MW)

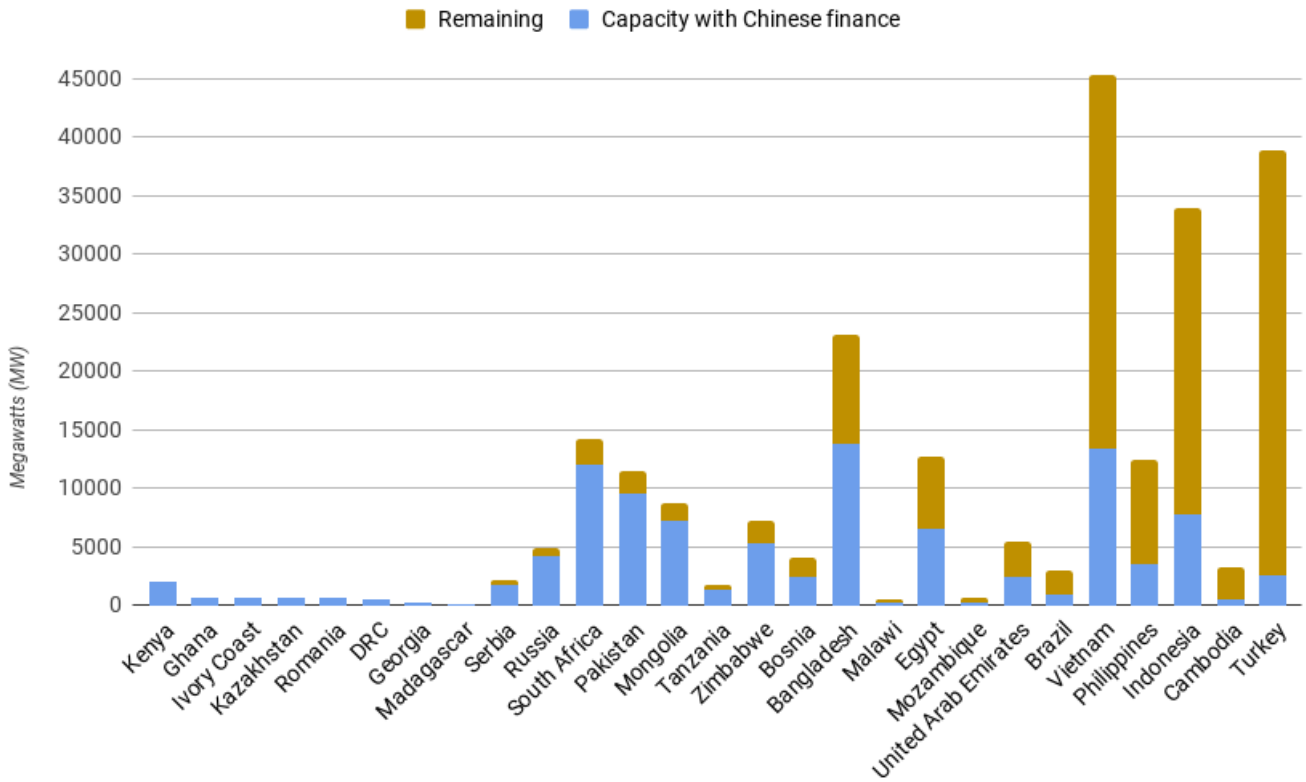


Figure 3 shows coal-fired capacity with Chinese finance as a percentage of all coal-fired capacity under development in the country, from highest percentage (left) to lowest percentage (right). As can be seen in Figure 3, Chinese finance (light blue) is supporting all coal-fired capacity under development only in countries with little capacity under development overall (3GW and below), such as Kenya, Ghana, and the Ivory Coast. Chinese finance makes up 75% or more of all coal-fired capacity under development in countries such as South Africa, Pakistan, and Zimbabwe, and 50% or more in Bosnia and Herzegovina, Bangladesh, and Egypt.

While Vietnam, the Philippines, and Indonesia are among the countries with the highest amount of coal-fired capacity supported by Chinese finance, the support is less significant as a percentage of total capacity, with Chinese finance supporting 30% of all coal-fired capacity under development in Vietnam, 28% in the Philippines, and 23% in Indonesia. In these countries, Japanese and South Korean finance are also significant players.

Nearly two-fifths of the capacity under development with Chinese finance is categorised as ultra-supercritical technology (38%), followed by supercritical (35%) and subcritical (23%). This compares with subcritical technology making up 58% of plants funded by Chinese policy

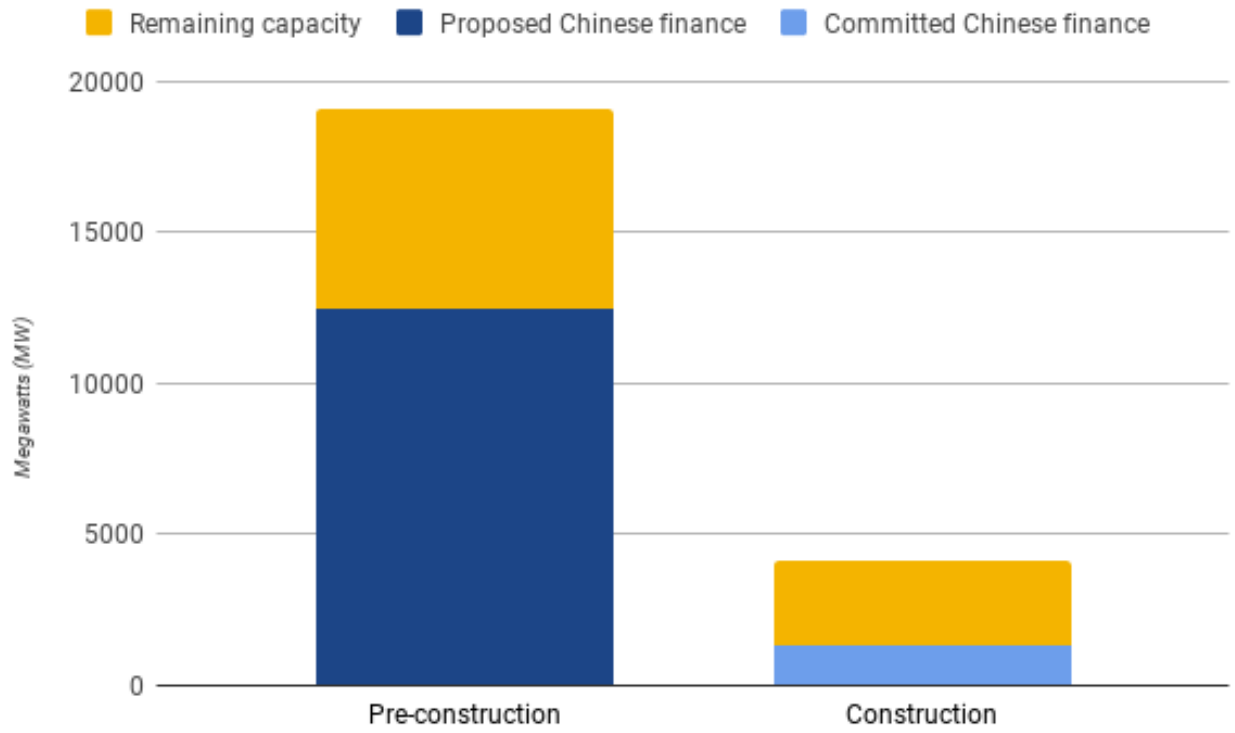
banks between 2001 and 2016.[12] While the move away from predominantly subcritical technology means lower coal consumption per kilowatt-hour (kWh) of use, it also means higher costs, making the plants less competitive compared to ever-lower cost renewable energy alternatives. Also, many policy banks have implemented CO2 performance standards that rule out financing for less efficient subcritical or supercritical technology.

Country Profiles

Bangladesh

Bangladesh is the country with the most proposed coal-fired capacity and funding from China, totalling US$7.05 billion for about 14GW of capacity. However, most of this capacity is long delayed and still in pre-construction status, and has yet to reach financial close. Only 1,320 megawatts (MW) is under construction and has committed funding from China, rather than just proposed funding.

Figure 4: Coal-fired Capacity Under Development in Bangladesh with Chinese Finance (MW)



Four of the power plants were agreed to when Chinese president Xi Jinping travelled to Bangladesh in October 2016 as part of China's BRI to finance infrastructure in other countries. All of the coal plant proposals agreed to as part of BRI remain in the pre-construction stage, and are still seeking permits (namely the Banshkhali, Boalkhali, Daudkandi, and Mirsarai coal plants). Additionally, several proposals are for the same location. A 1,320MW coal-fired

[12] Center for International Environment and Resource Policy, The Fletcher School, Tufts University, "Policies Governing China's Overseas Development: Finance Implications for Climate Change", March 2018.

power plant in Patuakhali has been proposed by three different sets of sponsors, all joint ventures between Bangladeshi and Chinese firms. Additionally, two 1320MW plants have been proposed at Maheshkhali as part of a proposed massive new port and power complex, despite significant community unrest due to conflicts around tourism and fishing.

It remains to be seen whether the proposed level of import coal-based capacity is indeed needed, viable, and able to be implemented. Given the population density of Bangladesh, many of the proposals compete with existing land uses such as housing and food production. Five people were killed protesting construction of the proposed 1224MW Banshkhali power plant, co-sponsored by SEPCOIII Electric Power Construction Corporation of China, which would displace an estimated 7,000 households. Massive public opposition also defeated the planned Phulbari coal plant and open pit mine, although plans for up to 6GW of coal-fired capacity in Phulbari have recently been revised with Chinese backing.

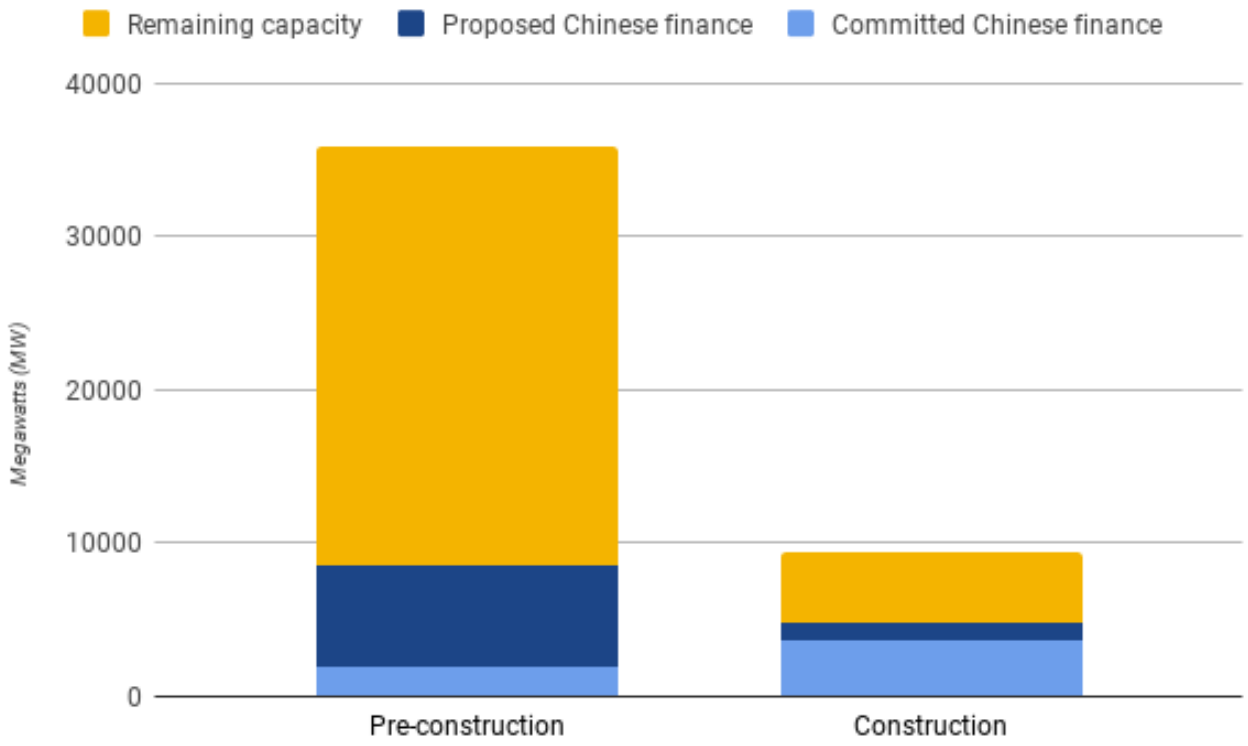
About 8GW of the 14GW of proposed capacity would be joint ownership coal plants with Chinese SOEs, meaning the SOEs will be involved with operation and management. The joint ownership signals a plan for stronger and longer-lasting ties between Chinese and Bangladeshi firms than EPC-only contracts, and reflects Chinese enterprises' increasing transition from contractors to overseas operators and investors. Chinese banks are also funding infrastructure to import coal into the country to fuel the proposed plants, with import terminals at Matarbari Port, Payra Port, and the Port of Mongla all under construction.

IEEFA notes that constructing so many coal plants based on imported coal will instil a long-term dependence on volatile fossil fuel imports precisely at the time when prices for solar, wind, and grid efficiency are predicted to soon fall below coal power in the country.[13]

[13] IEEFA, "A Better Way Forward for Electrification in Bangladesh", 18 November 2016.

Vietnam

Figure 5: Coal-fired Capacity Under Development in Vietnam with Chinese Finance (MW)



Vietnam has the second most proposed coal-fired capacity after Bangladesh, totalling 13,380MW, with the fourth most funding, totalling US$3.6 billion. Most of the projects (58%) are fairly advanced, with 4,800MW under construction and 3000MW permitted. Forty-two per cent of the capacity (5,580MW) has committed funding.

Chinese banks have already built and funded a number of completed coal plants in Vietnam. In total, Chinese EPC firms have built fifteen coal-fired power plants in Vietnam, with Chinese banks providing US$8.6 billion in funding for them.[14] Many of the current proposed coal projects are an additional phase of already completed plants.

Unlike Bangladesh, few of the proposals in Vietnam involve joint ownership (making up only 600MW) and are instead EPC or build-own-transfer contracts (making up a combined 3,000MW and 4,980MW respectively). Under these arrangements, sponsorship by companies often changes over time, including at Hai Duong Thermal Power Plant, Long Phu 3 Power Centre, Nam Dinh power plant, Quang Trach 2 Power Center, and Quynh Lap 1 power plant. This suggests the specific company may be less important than the strategic relationship with China as a supporter and financial backer of the plants.

[14] Vietnam Investment Review, "China funds coal away from home", 27 December 2017.

South Africa

The China Development Bank has recently emerged as a large funder in South Africa, as currency fluctuations, economic instability, and increasing coal-related corruption issues have put pressure on coal financing in the country. The Bank recently provided US$4 billion to help fund the completion of two large coal plants currently under construction in South Africa. Chinese companies have also proposed two new large coal plants in the country, with financial backing from Chinese banks.

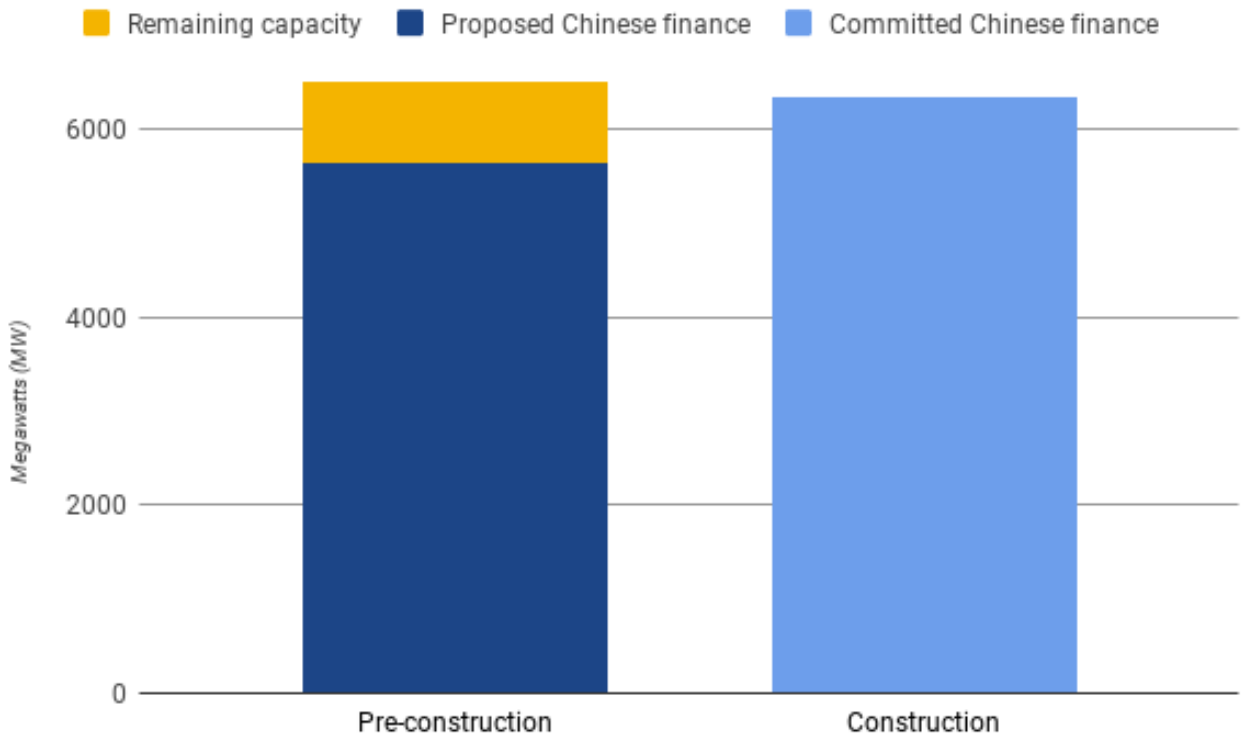
The Kusile and Medupi coal-fired power plants, each with a total gross capacity of 4,800MW, have both long been plagued by political corruption, increasing costs, problems with coal supply, and resulting difficulties in securing financing, causing prolonged delays in construction and commissioning.[15] The massive projects are also being built at a time when the country is facing stagnant electricity demand, leading to a power surplus. Economic analysts have concluded that state public utility Eskom would save money by cancelling the remaining units at Kusile rather than completing them.[16]

On July 6, 2017, the China Development Bank announced it would loan US$1.5 billion to Eskom to fund completion of the Medupi coal plant. The loan came just two days before a G20 climate action plan, agreed to by Chinese President Xi Jinping, calling on multilateral development banks to offer "coordinated support for country driven long-term strategies for low greenhouse gas emissions". One year later, in July 2018, Eskom signed a US$2.5 billion loan agreement with the China Development Bank for the Kusile plant, helping Eskom meet its goal to secure 62% of the financial year 2018-19 funding requirement.

In addition to funding Eskom's mega coal plants, Chinese companies have proposed a coal-fired power plant, Colenso, as part of South Africa's coal independent power producers (IPP) program. However, the project was not chosen in the first round of bids. While the sponsors planned to submit the plant for the next round of bidding, in September 2017 the Minister of Energy announced that all future IPP programs were on hold until the government assessed the amount of power capacity needed.

[15] Reuters, "South Africa's treasury completes probe of alleged corruption involving state firms Eskom, Transnet", 30 July 2018.
[16] IEEFA, "IEEFA Guest Commentary: The Sensible Path Forward for South Africa's Eskom", 30 November 2017.

Figure 6: Coal-fired Capacity Under Development in South Africa with Chinese Finance (MW)



In July 2018, Chinese SOEs and the South African Government signed a memorandum of understanding (MOU) for the development of a proposed US$10 billion metallurgical complex in Limpopo province, including plans for a 4,600MW coal power plant. The Bank of China said it will fund the project.[17]

In August 2018, South Africa's government released a draft update of its Integrated Resource Plan (IRP), describing national plans for electricity capacity expansion up to 2030. The draft IRP plans 12GW of coal plant retirements by 2030, and 1GW of new coal-fired capacity already chosen under the country's coal IPP program, as well as completion of the remaining Medupi and Kusile plants. The 4,600MW plant in Limpopo is not listed in the IRP, and its future is unclear.

Pakistan

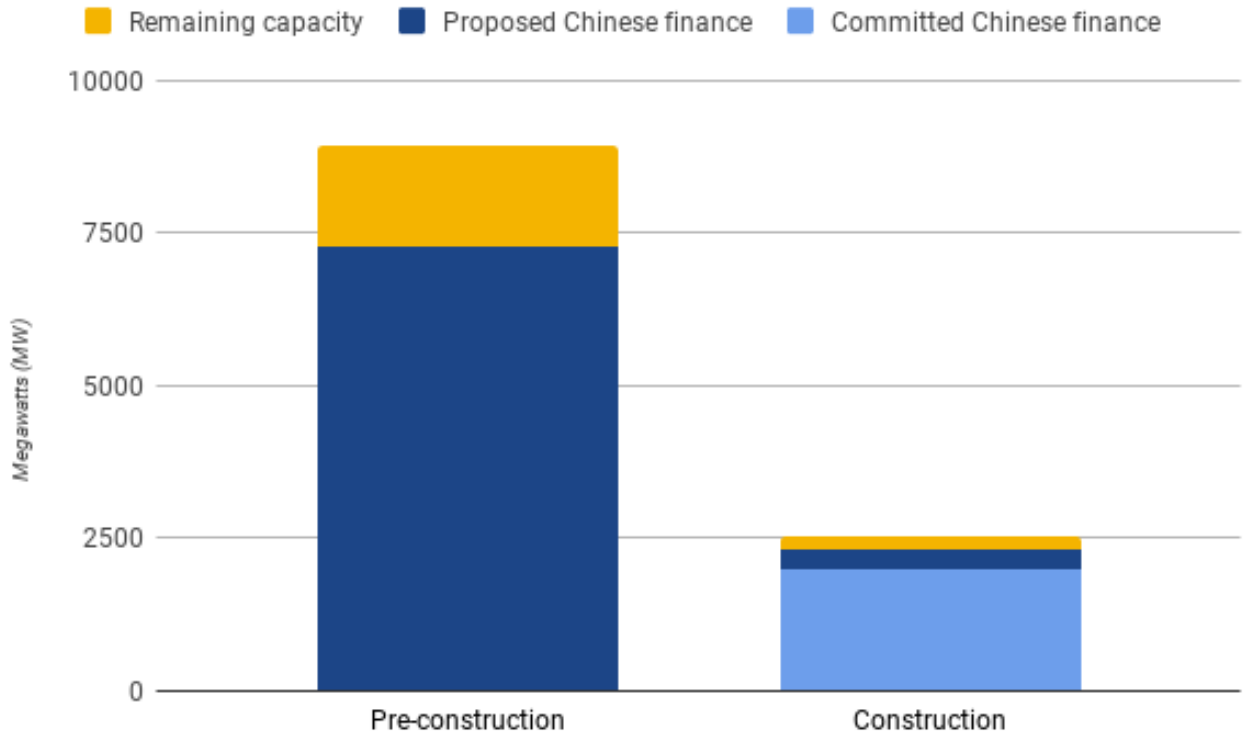
Chinese banks and SOEs have proposed funding 9,580MW of predominantly imported coal-fired power capacity under development in Pakistan, although funding has only been committed for 1,980MW of capacity, which is currently under construction. The remaining 7,600MW of capacity have yet to reach financial close, with 7,270MW in pre-construction status.

Several coal plant proposals are part of the China-Pakistan Economic Corridor (CPEC), a collection of infrastructure projects in Pakistan supported by Chinese funding. Projects

[17] SourceWatch, "Musina-Makhado power station."

include the Gwadar, Hubco, Rahim Yar Khan, and Keti Bandar coal-fired power plants, all of which involve construction of coal import infrastructure such as rail, ports, and jetties; and the Thar Block II, Thar Block VI, and Thar SSRL power plants, all of which include new domestic coal mining projects in Pakistan's Thar coalfield.

Figure 7: Coal-fired Capacity Under Development in Pakistan with Chinese Finance (MW)



Like Bangladesh, most of the financing (6,570MW) involves joint ownership of the coal plants, suggesting longer-term relations than just EPC contracts. The bulk of the proposed coal plants in both Pakistan and Bangladesh are part of larger projects around import infrastructure and mining with China under the BRI.

Recently, Pakistan began seeking an International Monetary Fund bailout, with some analysts pointing to China's lavish lending under the BRI as a culprit. This is because the deals typically require that the money be spent on Chinese goods, services and labour, with often opaque and onerous repayment terms, and with initial grace periods used to mask the true life-of-project financial costs involved.[18]

A recent IEEFA analysis found renewable energy including solar and wind is already the cheapest form of new energy generation in Pakistan, and recommends the country cancel its proposed coal and gas plants to avoid dependence on fossil fuel imports. The Pakistan rupee has recently depreciated significantly against the U.S. dollar, making imports of

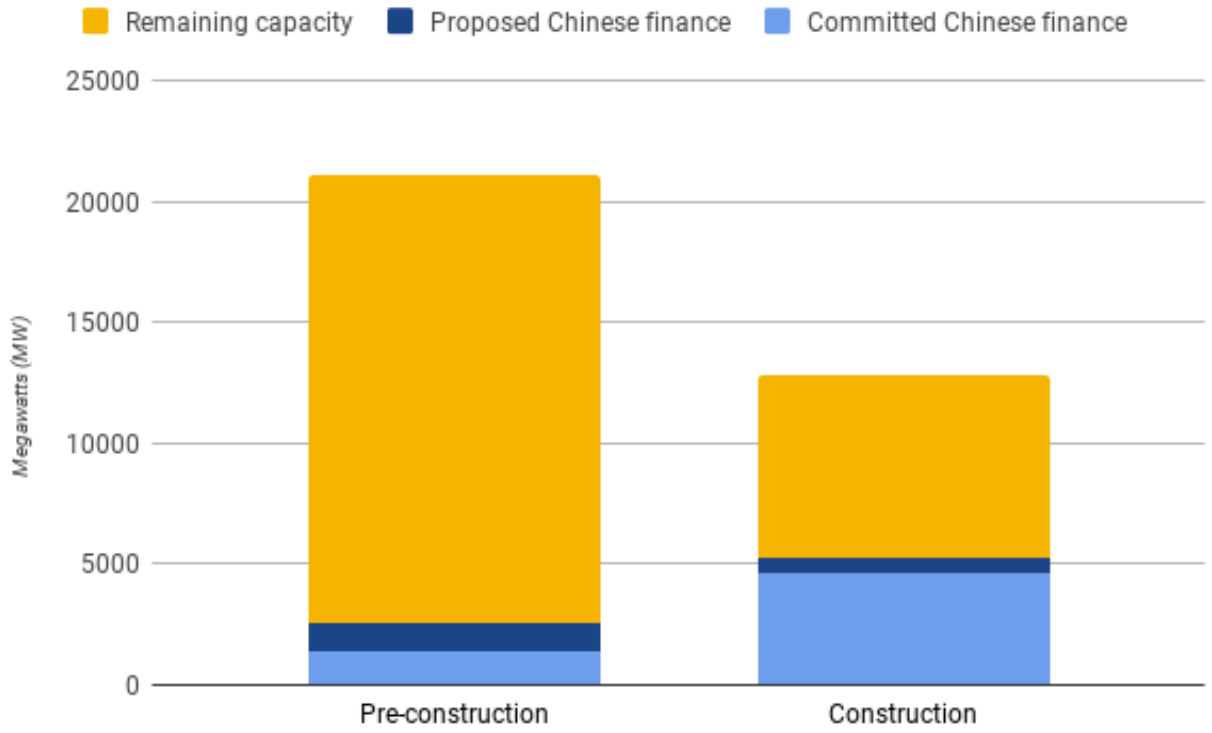
[18] Business Standard, "Pakistan's need for a bailout comes from China's reckless lending", 2 August 2018.

commodities traded in U.S. dollars (such as fossil fuels) increasingly expensive, and draining of the country's foreign exchange reserves.[19]

Indonesia

Since 2004 the Indonesian government has launched plans for the quick scale-up of coal-fired power in the country, citing the need to diversify away from oil plants and volatile oil imports. The country currently has 28GW of operating coal-fired capacity, 18GW of which has been added in the last decade. Another 34GW of coal-fired capacity is currently under development. Like Bangladesh and Pakistan, Indonesia is part of the BRI, with many of the proposed plants involving coal import infrastructure and domestic mining.

Figure 8: Coal-fired Capacity Under Development in Indonesia with Chinese Finance (MW)



Many of the proposed coal projects were secured by Chinese SOEs who were able to outbid Japanese, South Korean, and European consortiums for construction contracts, although recent reports also point to bribery and corruption as factors.[20] As a result, Indonesia currently has a large amount of committed funding from Chinese banks, making up 6GW (18%) of the 34GW under development.

After technical issues and delays plagued the first rounds of coal-fired plant contracts, the Indonesian government has preferred Chinese contractors take a stronger strategic stake in

[19] IEEFA, "IEEFA report: Pakistan could build greater energy security by increasing use of cheaper renewables", 5 December 2018.
[20] The Jakarta Post, "PLN suspends power plant project over graft case", 17 July 2018.

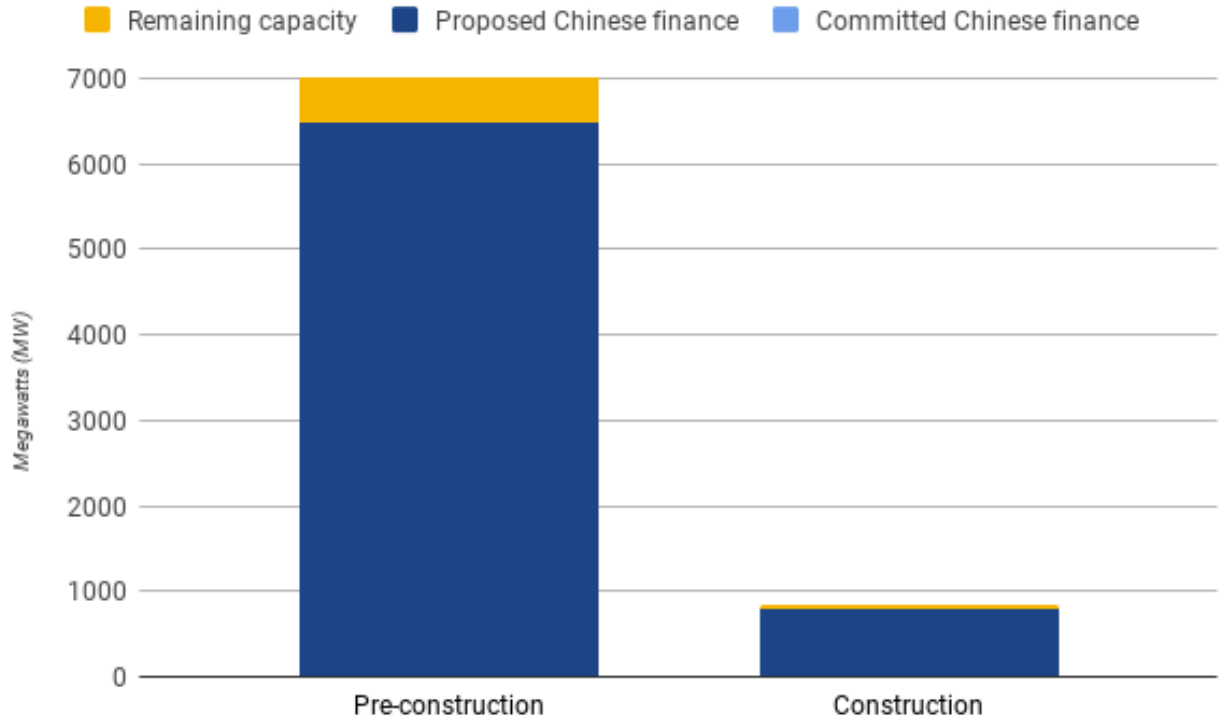
the plants beyond construction and finance, including operation and ownership.[21] The majority of current coal-fired plant proposals with Chinese finance are either joint ventures (2,742MW) or build-own-transfer contracts (1,800MW) with Chinese SOEs. Yet most plants have been built with guaranteed tariffs, saddling the Indonesian state-owned utility Perusahaan Listrik Negara (PLN) with guaranteed payments and foreign exchange-exposed financing costs that are straining central government finances. In response, this year PLN delayed nearly 9GW of power projects, mostly fossil fuel-based.[22]

Where technology is known, subcritical technology makes up nearly half of the proposed coal-fired capacity supported by Chinese finance, lagging the norms in regulated markets, and leading to protests by local groups and environmentalists over the environmental effects. Labour strikes have also broken out at the projects, with workers protesting the high number of Chinese workers and low number of local jobs associated with the contracts.

Mongolia

Mongolia has 6,480MW of capacity with proposed funding from China, none of which has reached financial close. The capacity is made up of three projects, all of which involve domestic coal mining. Most of the capacity consists of the Shivee Ovoo project, a 5,280MW plant that has been proposed in various forms for a decade. Power from the plant is planned to be exported to neighbouring China.

Figure 9: Coal-fired Capacity Under Development in Mongolia with Chinese Finance (MW)



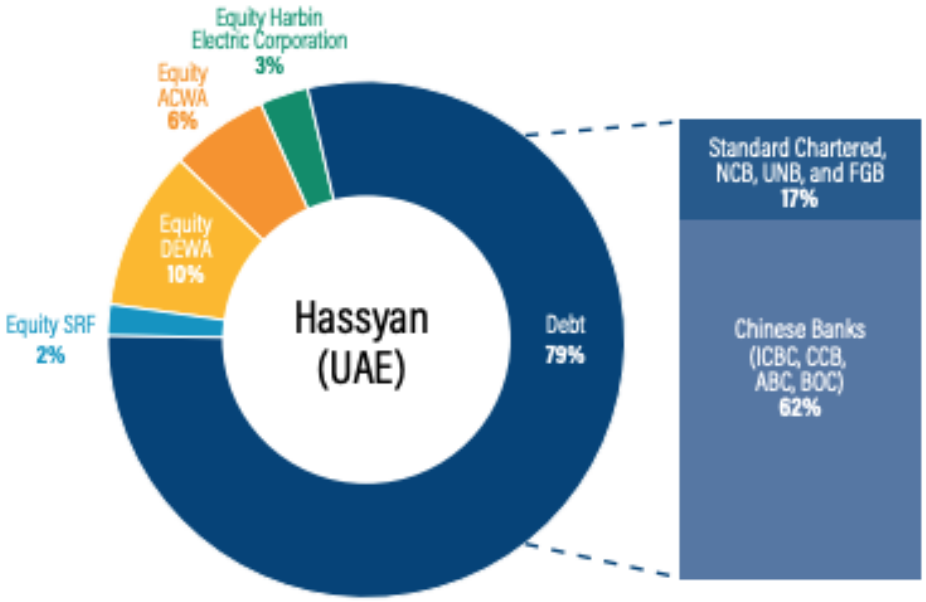
[21] South China Morning Post, "Why does Indonesia cling to its plagued Chinese infrastructure projects?" 11 December 2018

[22] IEEFA, "IEEFA report: Pakistan could build greater energy security by increasing use of cheaper renewables", 5 December 2018

United Arab Emirates

The United Arab Emirates (UAE) has 2,400MW of coal-fired capacity under construction with Chinese finance. The capacity consists solely of the US$3.4 billion Hassyan coal plant, a joint venture between UAE's Dubai Electricity and Water Authority (DEWA) with Harbin Electric of China and ACWA Power of Saudi Arabia. Equity is provided by the companies, with the majority of debt provided by four Chinese state-owned commercial banks, including the Bank of China and the Industrial and Commercial Bank of China. The project is the first coal plant in the UAE and is part of China's BRI. Dubai Electricity and Water Authority (DEWA) is planning phase II of the coal plant.

Figure 10: Financing Structure of Hassyan Coal Plant in the United Arab Emirates



Source: WRI 2018.[23]

Philippines

The Philippines consists of more than 7,000 islands and currently relies largely on imported diesel and imported coal for electricity generation. The country has 8GW of operating coal-fired capacity, half of which has been added since 2010. Another 13GW is currently under development. The country is also part of the BRI.

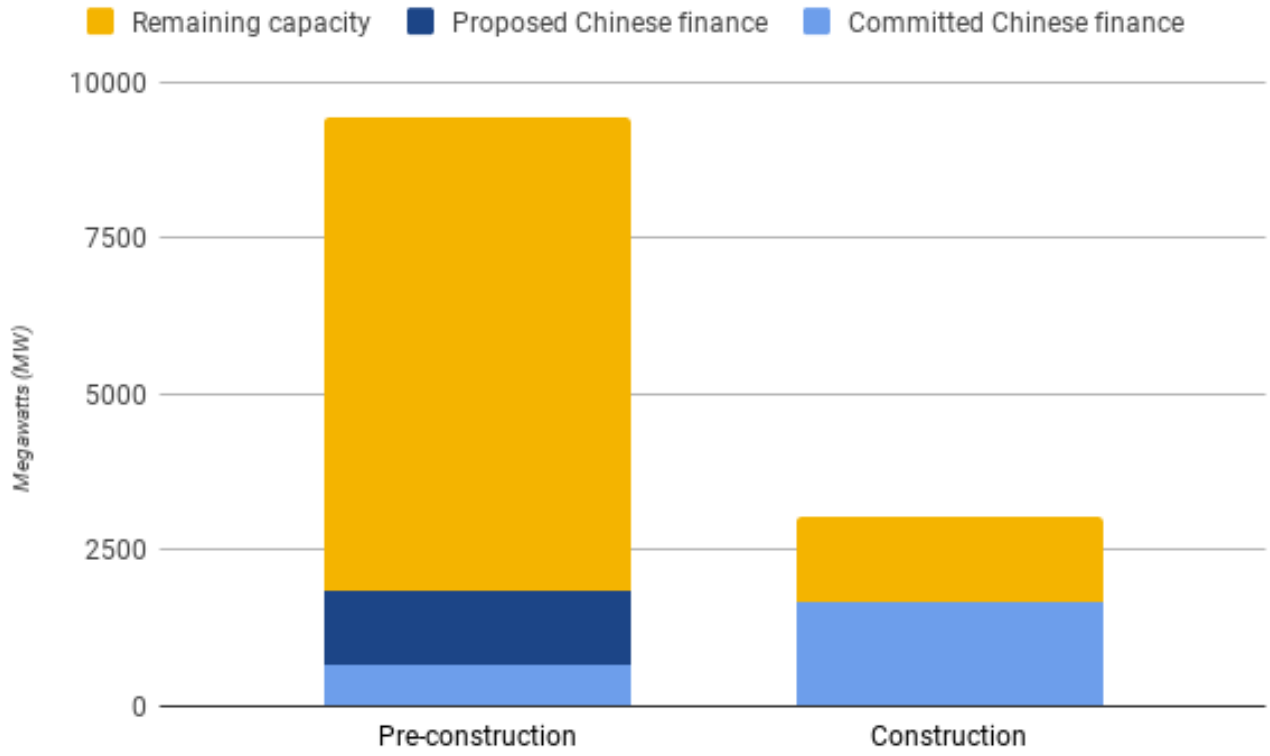
The Philippines has committed funding from China for 2,343MW of coal-fired capacity and proposed funding for another 1,200MW of capacity. The Dinginn, Lanao Kauswagan, and Quezon coal plants all involve Chinese SOEs acting as EPC contractors with funding from

[23] World Resources Institute, "Moving the Green Belt and Road Initiative: From Words to Actions", Working Paper, October 2018.

Chinese financial institutions. In early 2018, China Energy Engineering Corporation was looking to build merchant plants in the country with capacities of 150MW and 600MW.

IEEFA notes that the Philippines has some of the highest-priced electricity in the 10-member Association of Southeast Asian Nations. Utilities and power generators can automatically pass on to consumers foreign exchange risk and changes in fuel prices, remaining insulated from market changes. This means there is little incentive to procure least cost power, despite there being a financial case to lower overall electricity prices via the deployment of renewables, including rooftop solar and wind power.[24]

Figure 11: Coal-fired Capacity Under Development in the Philippines with Chinese Finance (MW)



Russia, Turkey, and Bosnia and Herzegovina

All funding for Russia, Turkey, and Bosnia and Herzegovina is proposed funding that has not yet reached financial close. Most of it is for coal-fired capacity in a pre-construction stage of development.

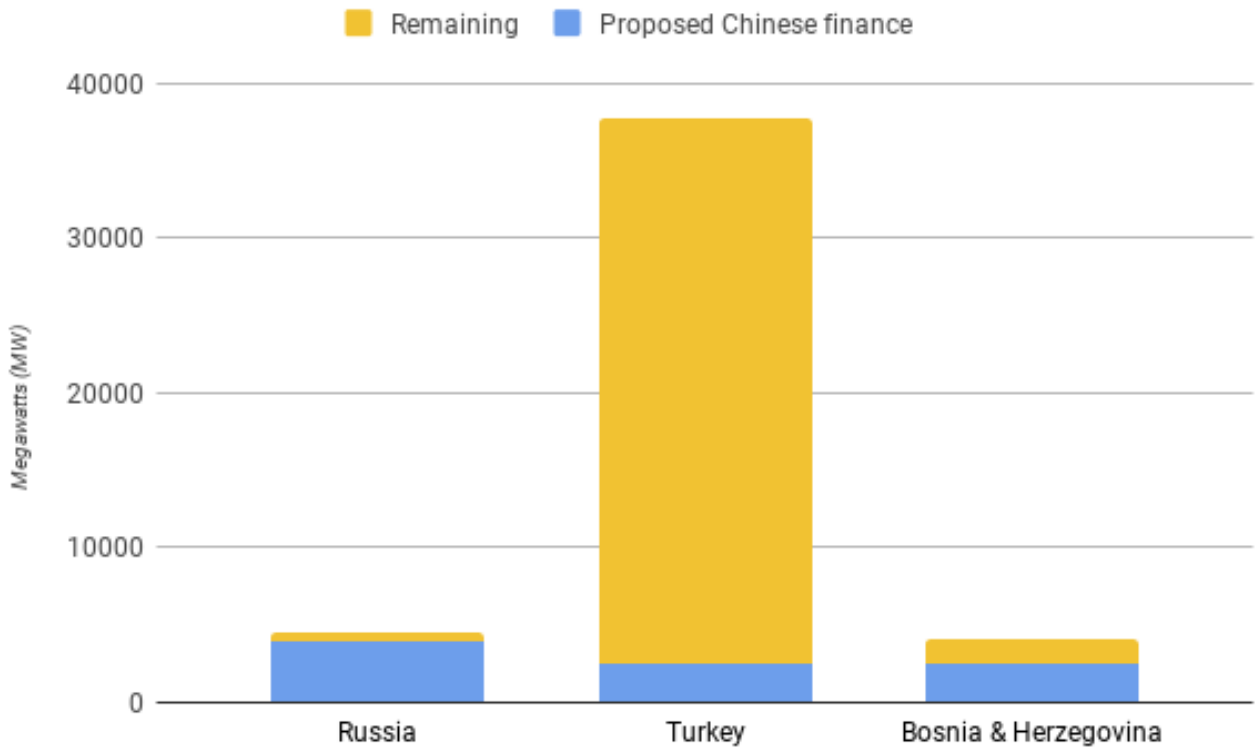
In Russia, capacity is dominated by the proposed Erkovetskaya coal plant. Originally planned to be 8GW, the project is to be powered by lignite from a new Russian coal mine less than 100 km from the border with China. The power would be exported to China, with

[24] IEEFA, "Philippines can lower electricity costs, improve energy security by developing rooftop solar potential", 20 August 2018.

Chinese development banks providing at least 70% of project finance. In June 2017 it was reported that the project had been suspended due to a decline in China's electricity consumption, however in May 2018 the project was reportedly revived, but reduced to 4GW.

In Turkey, Chinese power giant State Power Investment Corporation (SPIC) has aligned with two Turkish investors for the 1,320MW EMBA Hunutlu coal plant, with funding to be secured by SPIC. The project has been proposed since 2012 but looked defeated due to public opposition, currency volatility, and lack of funds, until revived by SPIC in 2015. The Industrial and Commercial Bank of China has also proposed funding for the Ilgın coal plant, which opponents say would displace residents across three villages, and which has been widely opposed by locals and their mayors.

Figure 12: Proposed Coal-fired Capacity in Russia, Turkey, and Bosnia and Herzegovina with Chinese Finance (MW)



Bosnia and Herzegovina rely principally on coal for its' energy needs, with significant lignite coal reserves. Bosnian politicians have embraced new coal-fired projects reportedly as a means to create jobs, and China has emerged as a recent, large funder of these projects, with proposed financing for six coal plants in the country. Most of the projects have long been planned by the government of Bosnian and Herzegovina but floundered for lack of funds, particularly as the World Bank and affiliates have moved away from coal financing. All of the projects involve EPC contracts with Chinese SOEs, who then arrange loans for the plants from Chinese financial institutions.

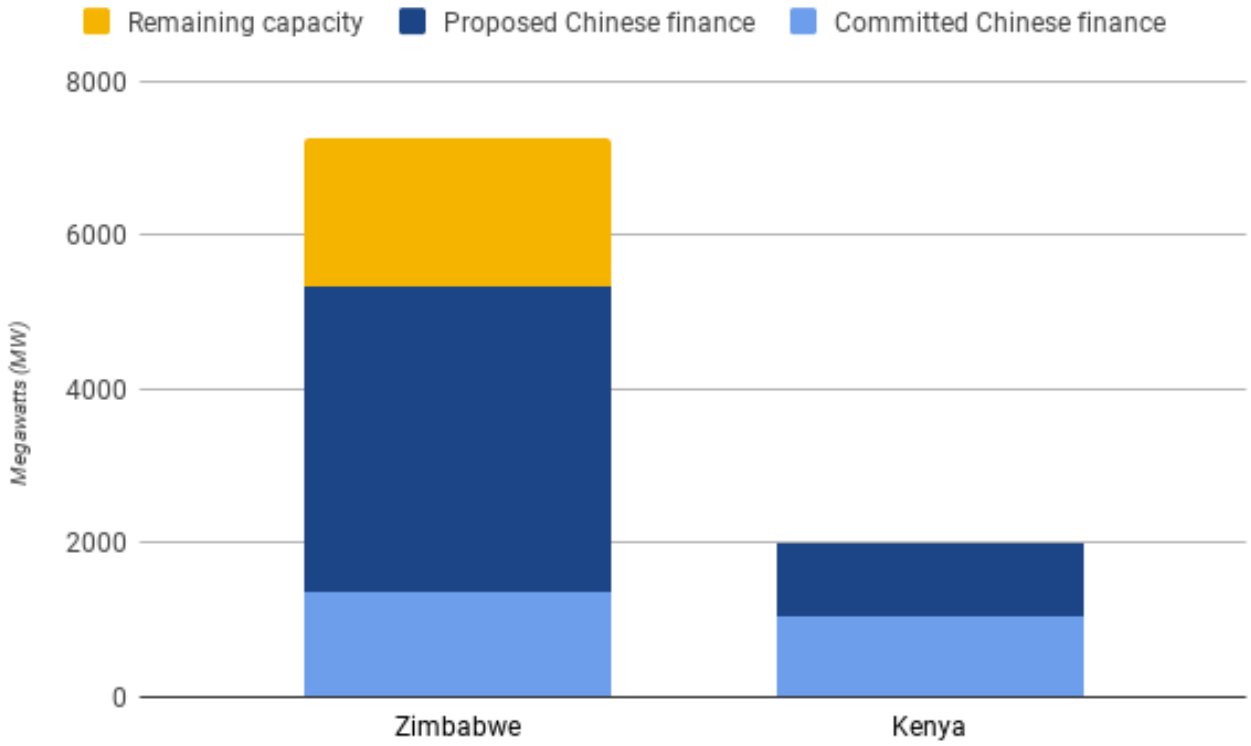
Egypt

Egypt currently has no operating coal-fired plants. However, it has proposed several coal-fired projects since removing its ban on coal plants in 2015 in response to national energy shortages. The largest proposal is the 6,600MW Hamarawein IPP coal project, which would be the second largest coal plant in the world if completed. In January 2016, it was reported the plant would be funded by the Industrial and Commercial Bank of China, the Export and Import Bank of China, and the Chinese Development Bank, although their financing has not been confirmed. In June 2018, Egyptian Electricity Holding Company announced that a consortium of China's Shanghai Electric and Dongfang Electric Corporation won the tender to build the project, with the lowest bid of US$4.4 billion.

Zimbabwe and Kenya

All of the coal-fired capacity with Chinese funding in Zimbabwe and Kenya is in pre-construction status. Zimbabwe has four projects totalling 5,330MW, all of which involve new domestic coal mines to fuel the plants. Chinese banks have committed over US$2 billion for the projects.

Figure 13: Proposed Coal-fired Capacity in Zimbabwe and Kenya with Chinese Finance (MW)



In Kenya, the Industrial Commercial Bank of China has provided US$1.5 billion in financing for the Lamu coal plant, a highly contested project along Kenya's Indian Ocean coast. Over 975 acres has been set aside for the project, with 600 land owners expected to be affected. The project's permits continue to be challenged in court. In July 2018 it was reported that

feasibility studies on a 960MW coal-fired plant in Kenya's Kitui Basin were also underway. A coal mining concession in the Basin has been awarded to Fenxi Mining Industry who say they have financial backing from the China Construction Bank, among others.[25]

China's Green Finance Expansion

While this report focuses on China's continued international financing and development of new coal-fired power plants, we note that China is a world leader in developing sustainable renewable energy projects, both within China and increasingly on the global stage.

Consistent with this, in 2014 to 2015 China launched two multilateral development banks, the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB), both of which have a priority focus on low emissions technology deployment.

The AIIB provides finance to support electricity access, with new renewable and gas power projects across countries like India, Pakistan, Bangladesh, Myanmar, and Egypt. The AIIB aims to be a green development bank, providing sustainable energy investments while supporting the Paris Agreement.

As of July 2018, the NDB had approved 23 projects valued at US$5.7 billion, with a primary focus on renewable energy, energy conservation, water access, and sustainable development infrastructure.[26]

However, as we outline in this report, to-date the investment in coal fired power plants globally by the traditional China's state-owned banks are far more significant than the AIIB and NDB. It is also undermining the stated strategy of the AIIB to enhance and support the Paris Agreement.

Conclusion

Chinese finance continues to play a significant role in global coal development, supporting over one-quarter of all coal plants currently under development outside China. Financing mainly comes from Chinese policy banks and state-owned commercial banks, with Chinese SOEs acting not just as construction contractors but as co-managers and owners. This means China increasingly has a direct financial or political stake in these projects which are often part of larger infrastructure projects involving new mines and import terminals. Yet these projects threaten to lock the host countries into costly, high-carbon infrastructure precisely at a time when clean energy costs from solar and wind power are falling below that of coal power. The projects are also misaligned with the green commitments the countries have made under the international Paris Agreement on climate change.

As other countries move away from financing coal, China will find itself increasingly isolated. The World Bank, most multilateral development banks, the export credit agencies (ECAs) of OECD countries, and many private banks have all ended or severely restricted their lending

[25] Standard Media, "Coal mining in Mui to start as politics ebbs off", 24 May 2018.
[26] NDB, "New Development Bank concludes successful participation at BRICS summit 2018 in Johannesburg, South Africa", 27 July 2018.

for coal plants. The moves have left China, Japan, and South Korea as the largest supporters of coal plants globally, although both Japan and South Korea have recently signalled their intent to limit coal financing.

This year, Japanese insurers Dai-ichi Life and Nippon Life have said they will not invest in new coal-fired generation projects, while national power giant Marubeni said that it will "no longer enter into any new coal-fired power generation business."[27] The move was followed by a call from Japan's prime minister for the country to move away from coal in line with the science behind the Paris Agreement.[28] South Korea's new president is no longer permitting new coal plants domestically, while promoting renewable energy investment and at the same time proposing to increase coal tax rates 30% to up to US$40/ton from April 2019.[29] Meanwhile, power giant KEPCO has recently suspended plans for new coal plants in Indonesia[30] and Vietnam[31] after being questioned about the pollution and climate impacts of the projects by the government, as well as the lack of consideration of clean energy alternatives.

China should similarly reconsider its funding for export coal mines, coal-fired power plants, and the associated rail and port infrastructure. The International Energy Agency (IEA) sees renewables contributing 60% of global additions to electricity generation capacity through 2022 and dominating over the next two decades.[32] Already, IEEFA estimates BRI has driven US$8 billion of solar equipment exports from China, helping China become the number one exporter of environmental goods and services, overtaking the U.S. and Germany.[33] Competitiveness for new, clean energy technology is only increasing as market-moving climate risks unfold in real time. It makes sense for China to continue to build on its position as the global leader in renewable energy development as the world moves away from fossil fuel-based capacity.

[27] Marubeni Corporation, "Notification Regarding Business Policies Pertaining to Sustainability (In Relation to Coal-Fired Power Generation Business and Renewable Energy Generation Business)", 18 September 2018.
[28] Financial Times, "Join Japan and act now to save our planet", 23 September 2018.
[29] Reuters, "S.Korea to raise coal tax; lower LNG tax for power generation", 30 July 2018.
[30] SourceWatch, "Cirebon power station."
[31] SourceWatch, "Quang Tri power station."
[32] International Energy Agency, "Solar leads the charge in another record year for renewables", 4 October 2017.
[33] IEEFA, "China 2017 Review: World's Second-Biggest Economy Continues to Drive Global Trends in Energy Investment", January 2018.

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The Institute for Energy Economics and Financial Analysis (IEEFA) conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. More can be found at www.ieefa.org.

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