

# 1-YEAR LATER: CHINA'S BAN ON OVERSEAS COAL POWER PROJECTS AND ITS GLOBAL CLIMATE IMPACTS

September 22, 2022

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### **1-Year Later: China's Ban on Overseas Coal Power Projects and Its Global Climate Impacts**

*September 22, 2022*

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## Key Findings

One year after President Xi Jinping announced China would "**not build new coal-fired power projects abroad**", there has been a significant dent in the country's planned coal pipeline overseas.

Approximately 104 coal plants — 102 gigawatts (GW) — in 26 countries were planned, considered, or in construction under either Chinese financing or engineering, procurement and construction (EPCs) agreements at the time of the announcement. While more than 13% of these projects have already been completed, the potential for China's ban to stop new coal and avoid additional carbon emissions from the pipeline remains enormous

If the proposed coal capacity in limbo is officially cancelled, it could result in an avoidance of 341 million tonnes of CO<sub>2</sub> emissions annually — equivalent to the United Kingdom's energy sector CO<sub>2</sub> emissions in 2021. This total avoidance would rack up to an estimated 8.6 billion tonnes of cumulative CO<sub>2</sub>, assuming that all coal plants would be retired by 2050, which will be crucial to evade 2°C of warming and keep with the Paris climate targets.

To highlight the continued importance of this ban, this report has evaluated China-backed overseas coal power plants according to their current status in the development process as of the end of August 2022. The plants were then grouped according to their existing or potential impacts on carbon emissions:

**OFFICIALLY CANCELLED:** 26 plants (21 GW) removed from the pipeline, avoiding the addition of 85 million tonnes of CO<sub>2</sub> per year. The majority of cancellations have been initiated by host countries; others have been cancelled/shelved due to poor project economics, years of legal challenges and local resistance, or delays in securing financing or permits.

**SHOULD BE CANCELLED:** 33 plants (36 GW) would avoid an additional 172 million tonnes of CO<sub>2</sub> from coal per year. Because these projects are still in the process of securing financing or permits, it is still possible for them to be cancelled or stopped. Vietnam leads with 6.4 GW, and several projects retained in the country's newest PDP8 draft already have difficulty in securing financing. Countries such as Mongolia (6.1 GW) and Laos (6.3 GW) have coal planned for the purpose of exporting electricity to neighbouring countries but such a move would leave these countries at great risk of stranded assets.

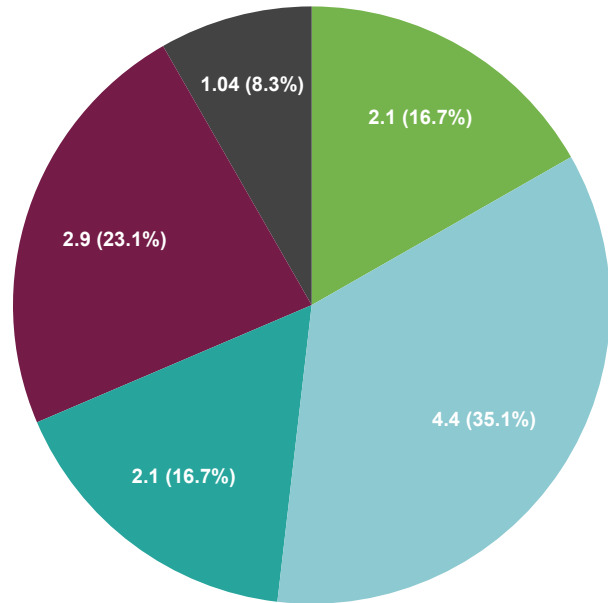
**COULD BE CONVERTED TO RENEWABLES (RE):** 16 plants (17 GW) in pre-construction can be converted to RE, or reconsidered for cancellation to avoid 84 million tonnes of CO<sub>2</sub> annually — approximately Colombia's CO<sub>2</sub> emissions from its energy sector in 2021. Because permitting and/or financing contracts have already been signed, a project will need to get built to ensure there is no breach of contract. However, because no physical infrastructure is in place yet, it is still possible for contracts to be renegotiated to renewables. Included in this list are 4 new coal projects whose contracts were signed after China's UNGA commitment, which suggests they are in violation of the ban.

**NEAR COMPLETION:** 27 plants (23 GW) well in construction means 104 million tonnes of CO<sub>2</sub> annually will come online. All of these plants were already in construction at the time of Xi's announcement, with the most number of plants found in Indonesia (7.8 GW or 9 plants), followed by India (3.4 GW), Pakistan (2.6 GW) and Vietnam (2.5 GW).

**TOO LATE:** 7.6 GW or 14 plants entered into operation, adding approximately 1.04 billion tonnes of CO<sub>2</sub> from coal if they operate until 2050 (36 million tonnes of CO<sub>2</sub> annually).

**Estimated cumulative CO<sub>2</sub> Emissions from China-backed coal planned and in construction, in billion tonnes**

- Officially Cancelled (CO<sub>2</sub> avoided)
- Should be Cancelled (CO<sub>2</sub> to be avoided)
- Could be converted to Renewables (CO<sub>2</sub> to be avoided)
- Near Completion (CO<sub>2</sub> to be minimized)
- Too Late - Began Operations (CO<sub>2</sub> to be emitted)



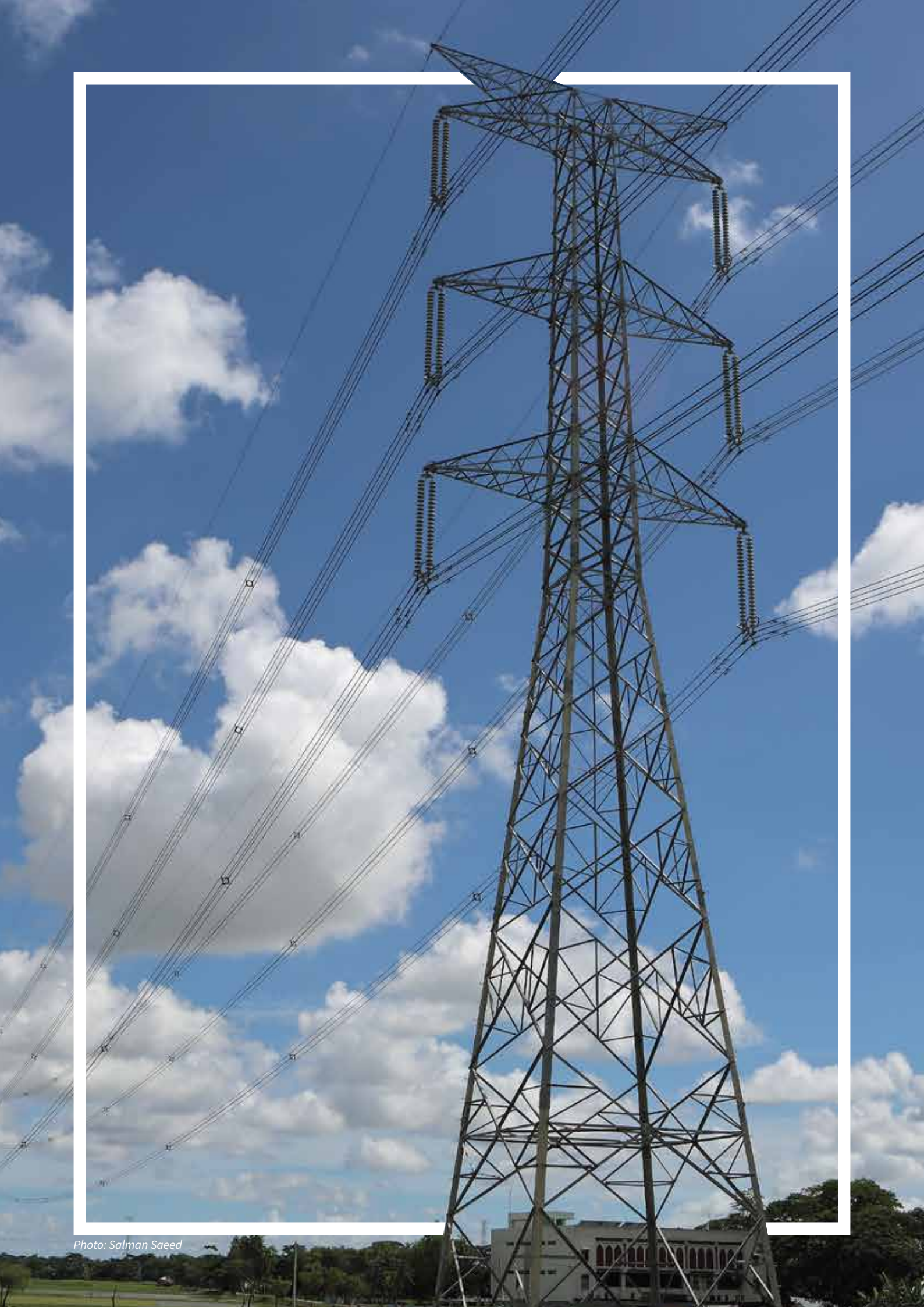


Photo: Salman Saeed

## Introduction

On Sept 22, 2021, Chinese President Xi Jinping announced at the 76th session of the United Nations General Assembly, that China “will step up support for other developing countries in developing green and low-carbon energy, and **will not build new coal-fired power projects abroad.**” In the past year, this has been followed up by significant policies within China, as well as host countries’ energy development plans, which have made a significant dent in China’s planned coal pipeline abroad.

When President Xi made the announcement, approximately 104 coal plants (102 GW) in 26 countries were being planned, considered, or even constructed, with either Chinese financing or engineering, procurement and construction (EPCs) agreements. Today, some of these plants have been commissioned, with others well under construction and likely to be completed; this will result in 140 million tonnes more climate polluting carbon dioxide (CO<sub>2</sub>) emissions from coal each year.

However, China’s ban on overseas coal can and must still deliver on its promise. More ‘new’ coal plants directly affected by President Xi’s announcement would eat into the global carbon budget from a sector that has massive opportunities to mitigate additional carbon emission in order to have a much more significant impact on the global climate. These remaining plants also account for two-thirds of proposed coal projects outside of China and India,<sup>1</sup> and thus deserve more attention and scrutiny.

Many overseas coal plants have already been officially cancelled; dozens are in reality suspended, with no finance or physical construction underway; and a significant number of plants are also in such early stages of construction that they can either be converted to renewable energy (RE) or renegotiated to be the most climate-friendly and responsible. **This could result in an impressive avoidance of 341 million tonnes of CO<sub>2</sub> emissions annually, approximately the United Kingdom’s energy sector CO<sub>2</sub> emissions in 2021.**<sup>2</sup> This would also mean more than 70% of the CO<sub>2</sub> at risk of being pumped into the atmosphere at the time of China’s announcement last year would be avoided.

Domestic policies both by China and by host countries are more crucial than ever. In March 2022, this pledge was written into domestic policy vis-a-vis China’s 14th Five-Year Plan on Modern Energy Systems, which provides the roadmap for the country’s energy sector development until 2025. More significantly, four Chinese ministries — namely the National Development and Reform Commission (NDRC), the Ministry of Ecology and Environment, the Ministry of Commerce, and the Ministry of Foreign Affairs — followed up on the promise with a joint guideline requesting that new coal projects be “stopped” and those in construction “proceed cautiously”. The Guideline shuts the door for more planned coal projects, and can be expected to open up opportunities for more unnecessary CO<sub>2</sub> to be avoided.

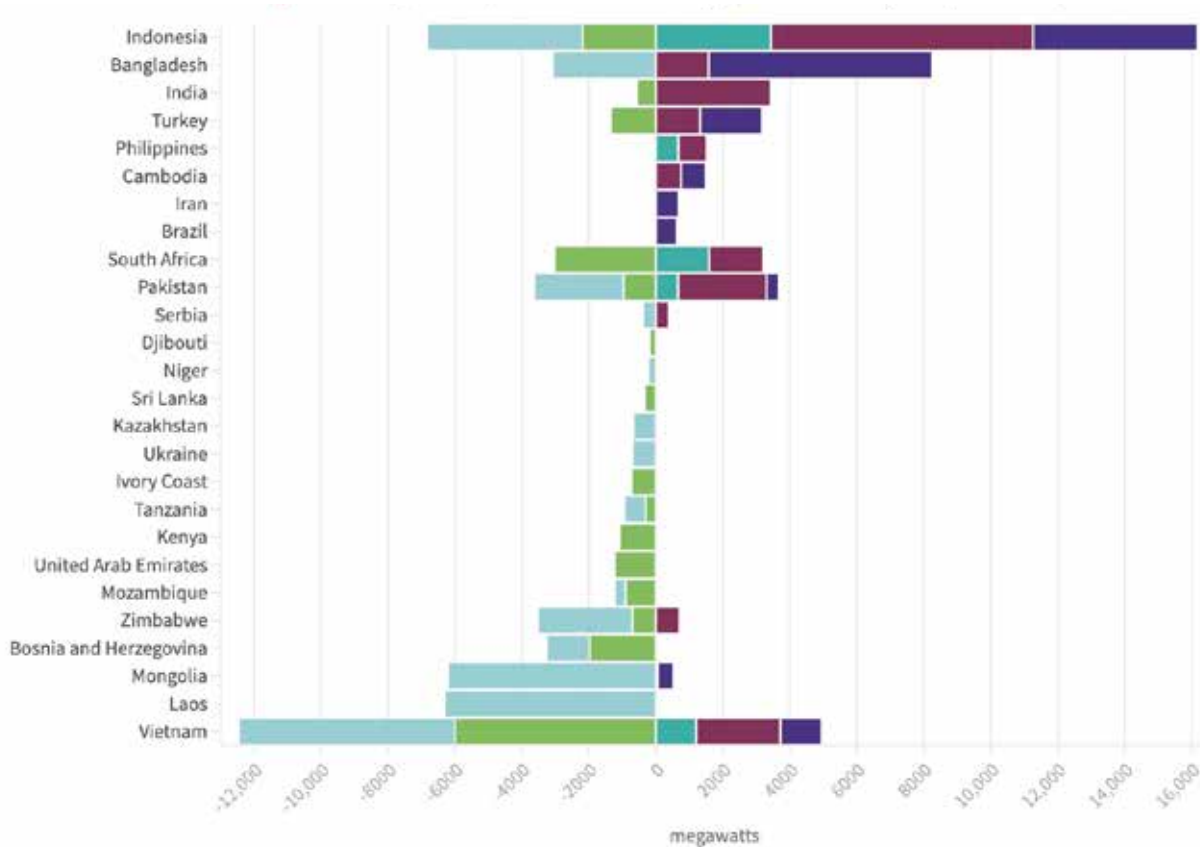
New energy policies coming out of host countries are seeing a diminished role for coal in future power development, allowing a window of opportunity for project-level renegotiation which should see more proposed coal projects stopped. For instance, Indonesia released its Energy Sector Roadmap for Net Zero Emissions by 2060, which includes a recommendation to reevaluate planned coal as well as accelerate coal retirements after 2030. A more optimistic scenario included in the draft even see a phase out by 2040.

<sup>1</sup> A total of 75.6 GW of coal are proposed (permitting, pre-permit, and announced stages) outside of China and India, according to the Global Coal Plant Tracker (July 2022)

<sup>2</sup> BP estimates reflect CO<sub>2</sub> from consumption of oil, gas and coal for combustion related activities:  
<https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>

### One Year Later, China’s Ban has Varying Impacts on Host Country’s Coal Pipeline

■ Officially Cancelled (CO<sub>2</sub> avoided)    
 ■ Should be Cancelled (CO<sub>2</sub> to be avoided)    
 ■ Could be converted to Renewables (CO<sub>2</sub> to be avoided)  
■ Near Completion (CO<sub>2</sub> to be minimized)    
 ■ Too Late - Began Operations (CO<sub>2</sub> to be emitted)



Source: Global Energy Monitor, CREA Analysis

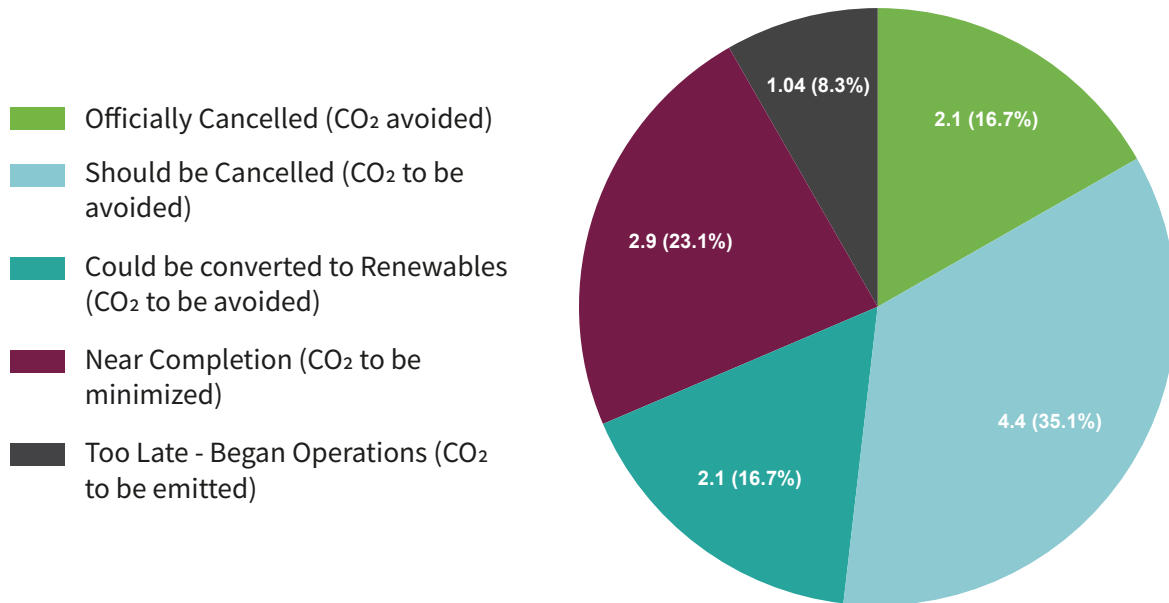
In addition to the negative public perception and climate concerns around coal, the increasingly poor economics of new coal power plants as well as options for cleaner, more affordable RE — all factors that influenced China’s decision to ban overseas coal — permeate. The current volatility in global fossil fuels prices and its impact on power and transport costs across the world have also brought issues of energy security to the fore. Continued reliance on fossil fuels puts host countries at great risk of stranded assets and hampers net-zero ambitions to 2050. Stopping all new coal assets from becoming operational should make crucial investments and capital available to indigenous renewable generation, grid improvements, and energy efficiency measures in host countries.

This one-year update looks at the pipeline of Chinese-backed coal projects at the plant-level to evaluate the avoidable carbon emissions that should still result from the ban on overseas coal.

# Plant Breakdown

Table 1: Potential impact of China’s ban on overseas coal measured in cumulative CO<sub>2</sub> emissions, assuming plants are retired by 2050

## Estimated cumulative CO<sub>2</sub> Emissions from China-backed coal planned and in construction, in billion tonnes



### OFFICIALLY CANCELED — CO<sub>2</sub> AVOIDED

Since the announcement of the ban on overseas coal, 26 plants (21.3 GW) have been removed from the pipeline of overseas China-backed coal in the last year, avoiding 2.1 billion tonnes of cumulative CO<sub>2</sub> if such plants were allowed operate until 2050. If built, these plants would have emitted approximately 85 million tonnes of CO<sub>2</sub> per year, or the equivalent of Venezuela’s total CO<sub>2</sub> emissions in 2020.<sup>3</sup>

The majority of cancellations have been initiated by host countries due to poor project economics, years of legal challenges and local resistance, or delays in securing financing or permits.

Vietnam removed the highest number of coal projects backed by China from its pipeline — 6 GW across 6 projects were no longer included in its July 2022 draft Power Development Plan. In Indonesia, 2.2 GW of plants backed by China were in the list of shelved projects under the National Electricity Supply Business Plan (RUPTL) 2021-30. South Africa cancelled the 3 GW Musina-Makhado power station, a major captive power project that has since replaced with 1 GW of solar power.

These cases highlight the opportunity for host countries in ensuring the implementation of the ban on overseas coal.

<sup>3</sup> Global Carbon Project. (2021). Supplemental data of Global Carbon Project 2021 (1.0). Global Carbon Project. <https://doi-org/10.18160/gcp-2021>.



Furthermore, several countries outside of South and Southeast Asia have virtually eliminated their coal pipeline with their cancellation. This includes Bosnia and Herzegovina (2 GW), Turkey (1.3 GW), the United Arab Emirates (1.2 GW), and Kenya (1 GW). While the countries remain highly dependent on fossil fuels, the cancellations will ensure that the share of coal in their energy plans do not increase and allow them to align their power development with pledges of no new coal and decarbonization.

In Bosnia and Herzegovina, all proposed coal projects are supported by loans or construction agreements with Chinese firms. The 4 shelved/cancelled projects highlight long-standing issues around unwanted coal in the country: the environmental permit for a mine tied to the Gacko coal plant was cancelled by a District Court and the plant shelved; the Kaknj Unit 9 has seen no known updates since 2014; Kamengrad coal project was not included in local spatial planning and attempts to revive plans for its construction have been stymied by public pressure. Most recently, in November 2021, a loan guarantee issued to the Bosnian Federation in 2017 for €614 million from the Export Import Bank of China for Tuzla 7 was ruled to be illegal. Such cancellations leave only two proposed coal projects in Bosnia and Herzegovina, both of which have yet to secure financing from China and can be stopped to completely remove coal from the country's pipeline (See Table 2).

Similarly, Turkey revoked the permits for the HEMA Amasra power station; the project was already majorly delayed, having been embroiled in legal challenges for over 15 years. In the UAE, the 1.2 GW Hassyan project was converted from coal to fossil gas in February 2022, completely removing coal from the country's list of additional capacity.<sup>4</sup>



Photo: Salman Saeed

<sup>4</sup> Global Carbon Project. (2021). Supplemental data of Global Carbon Project 2021 (1.0). Global Carbon Project: <https://doi-org/10.18160/gcp-2021>.

*Table 1: Cancelled China-backed Coal Plants by Country*

<b>COUNTRY</b>	<b>PLANT</b>	<b>TOTAL CAPACITY (MW)</b>	<b>ESTIMATED LIFETIME CO<sub>2</sub> (MILLION TONNES)</b>
<b>Bosnia and Herzegovina</b>	Gacko Unit 2	350	43
	Kakanj Thermal Unit 9	300	37
	Kamengrad Thermal Units 1 & 2	430	58
	Tuzla Units 7 & 8	900	95
<b>Djibouti</b>	Djibouti Units 1-3	150	18
<b>India</b>	JSW Barmer Jalipa Kapurdi Unit 9	540	67
<b>Indonesia</b>	Banyuasin Units 1 & 2	240	35
	Jawa-5 Unit 1	1000	110
	Riau-1 Unit 1 & 2	600	64
	Sumsel-5 Unit 3	350	43
<b>Ivory Coast</b>	San Pedro Port Unit 1 & 2	700	71
<b>Kenya</b>	Lamu Units 1-3	1050	108
<b>Mozambique</b>	Tete (China Energy) Proposal 2	200	26.3
	Tete (PowerChina) Unit 1 & 2	700	75
<b>Pakistan</b>	Gwadar Units 1 & 2	300	37
	Jamshoro Unit 6	660	63
<b>South Africa</b>	Musina-Makhado	3000	138
<b>Sri Lanka</b>	Lakvijaya Unit 4	300	35
<b>Tanzania</b>	Mbeya Coal	300	33
<b>Turkey</b>	HEMA Amasra Units 1 & 2	1320	159
<b>UAE</b>	Hassyan Clean-Coal Units 3 & 4	1200	124
<b>Vietnam</b>	Hai Phong-3 Thermal Unit 1 & 2	1200	117
	Quang Trach-2 Unit 1 & 2	1200	123
	Quang Tri-2 Unit 1 & 2	1200	110
	Quynh Lap-1 Unit 1 & 2	1200	115.5
	Quynh Lap-2 Unit 1 & 2	1200	115.5
<b>Zimbabwe</b>	Binga Unit 1A & 1B	700	76

## SHOULD BE CANCELLED TO AVOID CO<sub>2</sub>

Another 33 China-backed coal plants (35.7 GW) in the process of securing financing or necessary permits – and therefore not yet contracted – should be stopped given the ban on overseas coal. This would avoid a cumulative 4.4 billion tonnes of CO<sub>2</sub> between their individual proposed start date until 2050, or 172 million tonnes of CO<sub>2</sub> per year — more than Argentina’s total CO<sub>2</sub> emissions in 2020.

Vietnam has the most capacity that should be cancelled as part of China’s ban on overseas coal. The removal of 5 projects (6.4 GW) without firm finance would avoid a cumulative 736 million tonnes of CO<sub>2</sub>. Several of these identified projects are in the newest PDP8 draft, and are being pursued by the Vietnamese government despite their confessed difficulty in arranging capital. The plants are planned for 2026 and beyond, and will likely result in stranded assets if Vietnam is to phase out coal by 2050.

Plants such as Nam Dinh 1 and Song Hau 2 are reported to be preparing for construction but on the ground research shows that development has visibly halted. In Song Hau 2, landclearing has occurred but forcibly displaced surrounding farming communities. Many residents claim that in addition to the loss in livelihood, they have yet to receive compensation for the loss of their lands. In addition, families that have decided to stay are exposed to pollution from the operating Song Hau 1; if Song Hau 2 were to proceed, it would increase the pollution load in the area and the detrimental effects on their health.

*Beside Song Hau 1 (left), the planned site for Song Hau 2 in Hau Giang Province, Vietnam, still vacant as of end-Aug, 2022.*



*Photo: Jenny Nguyen Thao*

On the site reserved for the Nam Dinh-1 Thermal Power Project, residents remain to cultivate the agricultural land because land clearance and compensation have not been fully carried out. Although the investor has paid crops compensation to certain residents over the last 5 or 6 years – reported to be 1,080,000 Vietnamese Dong for 360m<sup>2</sup> for a 6 months harvest and calculated for 2 crops per year, a rate that many consider too low. An earlier draft of the PDP8 considered the plant for conversion to RE or gas, a move that should proceed given the difficulties of the project in closing finance. Notably, the developer on the project, Saudi Arabia’s ACWA Power, officially withdrew in June 2022. There has been no official information on the implementation progress moving forward nor is there a record of financial closure been officially reported.

*The planned site for Nam Dinh 1 in Hai Hau District, Nam Dinh Province, Vietnam, still vacant as of end-Aug, 2022.*



*Photo: Jenny Nguyen Thao*

Aside from Vietnam, Mongolia (6.1 GW) and Laos (6.3 GW) must avoid adding risky coal to their pipelines. Both countries plan to push coal forward, in part, for the purpose of exporting electricity to neighbouring countries. Many of Mongolia's proposed coal plants have Build-Own-Operate-Transfer agreements with China.

Similarly, Laos has sought to become a hub for Southeast Asia, seeking to engage in cross-border power trade with Thailand and Vietnam, in a bet to attract foreign capital. The majority of plants are slated for operation after 2025 so amid plummeting clean energy costs and the need for more stringent environmental regulations, the viability of a coal-fired power plant into 2050 is low. The burden will eventually fall on taxpayers in the countries that finance the plant through public capital, importing the electricity, and on Laos itself, where state-owned utility firm, Électricité du Laos is locking itself into polluting and costly coal for decades. This is especially concerning as under build-operate-transfer schemes, concession agreements often stipulate that control over energy projects be handed back to a public entity after a period of 20 to 30 years, who will bear much of the stranded asset risk.<sup>5</sup>

Laos is one of just two countries where we found new EPC contracts signed by Chinese firms in 2022, despite the pledge to stop coal abroad being in place. Engineering, design, and technical service contracts were signed for Houaphanh Unit 2 and the 2x330 MW Nam Phan "Clean" Energy project around April 2022. Notably, state-owned China Energy Engineering Corporation is involved with these projects, which they've labelled "clean energy" projects. Power plans in Laos strongly suggest that these projects will be coal. This shows a lack of understanding on the scope of the ban from companies, as well as a lack of scrutiny in the review process for overseas projects by the government.

<sup>5</sup> <https://www.adb.org/sites/default/files/institutional-document/547396/lao-pdr-energy-assessment-2019.pdf>

Table 2: China-backed Coal Plants that should be Cancelled by China's Ban, by Country

COUNTRY	PLANT	TOTAL CAPACITY (MW)	ESTIMATED LIFETIME CO <sub>2</sub> (MILLION TONNES)
Bangladesh	Patuakhali (Barisal) Unit 2	350	45
	Gazaria (Orion)	700	90
	Phulbari Coal (China Gezhouba) Units 1 & 2	2000	229
Bosnia and Herzegovina	Banovici Power Station	350	42
	Kakanj Thermal Power Plant Unit 8	300	37
	Ugljevik III Units 1 & 2	600	86
Indonesia	PLTU Jambi-2 Unit 1 & 2	600	75
	Nanshan Industrial Park Phase II Units 1-6, Phase III Units 1-4, Phase IV Units 1-8	2700	397
	Tanjung Jati A Unit 1 & 2	1320	140
Kazakhstan	Ekibastuz-2 Unit 3	636	82.16
Laos	Boualapha Unit 1 & 2	2000	187.5
	Hongsa Unit 4	626	64.75
	Houaphanh Unit 1 & 2	600	69.75
	Nam Phan Unit 1 & 2	660	70
	Sekong (Electricite du Cambodge) Unit 1 & 2	600	75
	Xekong Phase I - III	1800	173
Madagascar	Imaloto Coal power station	60	7
Malawi	Kamwamba Units 1-6	300	36
Mongolia	Baganuur Unit 1 & 2	700	73
	Shivee Ovoo	5280	824
	Shivee Ovoo Proposal 2	200	38
Mozambique	Ncondezi power station Unit 1 & 2	300	36
Niger	Salkadamna Phase I, Unit 1-4	200	26
Pakistan	Keti Bandar Unit 1 & 2	1320	135
	Thar Block VI Unit 1 & 2	1320	151
Serbia	Kolubara B1	350	50
Tanzania	Mchuchuma Unit 1 - 4	600	70
Ukraine	Slavyansk Unit 6a & 6b	660	32
Vietnam	An Khanh - Bac Giang Unit 1 & 2	650	89
	Cong Thanh Unit 1 & 2	600	82
	Nam Dinh-1 Unit 1 & 2	1200	136
	Song Hau-2 Unit 1 & 2	2000	222
	Vinh Tan-3 Units 1-3	1980	208
Zimbabwe	Sengwa Units 1-8	2800	318

In the site of the Phulbari coal mine-to-mouth, worker and developers have been exploring the potential excavating three to four months regularly. While some are convinced it will bring opportunities to the area, there has been very vocal resistance from farming communities that has stalled the mining project. With no physical infrastructure or land clearing has occurred, the project is one of many that should be included in the 10 coal power projects already cancelled by the Bangladeshi government.

*Site of Pulbari Power Plant in Dinajpur, Bangladesh as of August 2022*



*Photo: Salman Saeed*

### **SHOULD BE CONVERTED TO RENEWABLES TO AVOID MORE CO<sub>2</sub>**

In addition to the plants above, China's ban to stop new coal should also include 16 plants (17 GW) in pre-construction stages which can be converted to RE, or reconsidered for cancellation. This would avoid 84 million tonnes of CO<sub>2</sub> annually —approximately Colombia's CO<sub>2</sub> emissions from energy in 2021— and 2.1 billion tonnes of CO<sub>2</sub> if allowed to operate until 2050.

Because permitting and/or financing contracts have already been signed, China would need to deliver a project to avoid a breach of contract. However, given that no physical infrastructure is in place yet, it is still possible for these contracts to be renegotiated to renewables. Alternatively, host countries could initiate cancellations and renegotiations for projects facing delays and poor financial futures.

Bangladesh already faces costly overcapacity issues from coal. While 6.6 GW of China-backed coal have been permitted and in talks for years, they have seen significant delays. The country has already made moves to negotiate BRI projects, as well as cancel excess proposed coal, thus the conversion of these projects to RE should be prioritized. Developers for projects like Phulbari (Sinohydro) in Bangladesh have indicated that renegotiation may be an option; while GCM Resources committed to delivering a Phulbari project, they stated that it may be "in a form that fits in with the Bangladesh Government's Energy and Power Sector development ambitions" following President Xi's announcement.<sup>6</sup> In March 2022, GCM Resources reportedly raised £2.13m for the Phulbari coal and power project development;<sup>7</sup> the joint venture agreements with PowerChina were also extended to March 15, 2024. Bangladesh has already cancelled 10 proposed coal projects following China's ban, and must be vigilant in ensuring that no new coal enter its already congested and highly-polluting power mix.

The Patuakhali (RPCL/NORINCO) is set to be built in an area where five other coal units are proposed or in construction, all backed by either Chinese financing or EPCs. If all of these are constructed, it would constitute one of the largest air pollutant, mercury, and CO<sub>2</sub> emissions hotspots in South Asia and the world. The area is already plagued with pollution and CO<sub>2</sub> emissions, and the local population's livelihoods have been visibly affected. The variety of crops from watermelons and rice to fruits trees of coconuts, bananas, and mangoes once grown by local farmers have deteriorated in quality and yield after the Barisal Power Plant began construction.

*Site of Patuakhali Power Plant, Barisal, Bangladesh as of August 2022*



*Photo: Salman Saeed*

<sup>6</sup> [https://www.gem-wiki/Phulbari\\_power\\_station\\_'China\\_Gezhouba'#cite\\_note-8](https://www.gem-wiki/Phulbari_power_station_'China_Gezhouba'#cite_note-8)

<sup>7</sup> [https://www.morningstar.co.uk/uk/news/AN\\_1647025947582392500/in-brief-gcm-resources-extends-powerchina-jv-deal-by-two-years.aspx](https://www.morningstar.co.uk/uk/news/AN_1647025947582392500/in-brief-gcm-resources-extends-powerchina-jv-deal-by-two-years.aspx)

Site of Pulbari Power Plant in Dinajpur, Bangladesh as of August 2022



Photo: Salman Saeed

For Indonesia, the 4.9 GW of coal (890 million tonnes of lifetime CO<sub>2</sub>) under this category are classified as captive power projects for steel and nickel production. This includes 2 NEW projects whose contracts were secured after China’s UNGA commitment: the 1440 MW Sulawesi Labota Expansion and the 1520 MW Phase 3 of PT Halmahera Persada Lygend Nickel Smelter on Obi Island. While they are captive projects for China-funded industrial parks, their approval post-UNGA suggests they are in violation of the ban.

Table 3: China-backed Coal Plants that should be converted by host countries in line with China’s ban on overseas coal

COUNTRY	PLANT	TOTAL CAPACITY (MW)	ESTIMATED LIFETIME CO <sub>2</sub> (MILLION TONNES)
Bangladesh	Patuakhali (BCPCL) Unit 1 & 2	1320	164
	Patuakhali (RPCL/NORINCO) Unit 1 & 2	1320	164
	Phulbari Coal Project (Sinohydro) Unit 1-4	4000	458
Brazil	Pedras Altas Unit 1 & 2	600	106
Cambodia	Botum Sakor Unit 1 & 2	700	78
Indonesia	Nanshan Industrial Park Phase I Unit 4 & 5	60	9
	PT Halmahera Persada Lygend Nickel Smelter Phase III Units 5-8	1520	174
	Qingdao Zhongsheng captive Units 3-6	260	33
	Sulawesi Labota Units 4-5	1140	128
	Sulawesi Labota Expansion (Units 7-9)	1140	128
	Weda Bay Units 10 & 11	760	85
Iran	Tabas Units 1 & 2	650	70
Mongolia	Tavan Tolgoi (Rio Tinto) Units 1-3	450	85.5
Pakistan	Siddiqsons	330	42
Turkey	Ilgın Units 1 & 2	500	78
	Kirazlıdere power complex	1320	185
Vietnam	Vung Ang-2 Units 1 & 2	1200	128.2



Countries have untapped potential for renewables that will allow their grids to develop more quickly, as well as prepare them for gradually phasing out coal by 2050. Several coal projects backed by China have already been converted to RE, or gas in the last year. The Quynh Lap-1 and Quang Trach-2 projects in Vietnam has been converted to LNG technology. The government of South Africa also proposed the Musina-Makhado power station be replaced with 1 GW of solar.

Solar in particular will be an important cornerstone in the energy transition; the cost of solar in Asia has declined by over 80% in the last 10 years alongside significant improvements in their capacity factors. For projects without any physical infrastructure in place yet, solar and wind should be pursued.

### NEAR COMPLETION:

CO<sub>2</sub> to be added but stringent controls to minimize emissions and pollution impacts are needed

One year after the ban on overseas coal, 27 China-backed coal plants (24 GW) are near completion, to add 2.9 billion tonnes of cumulative CO<sub>2</sub> emissions if operational from 2022 to 2050. The combined emissions from these plants would emit 104 million tonnes of CO<sub>2</sub> annually — more than Bangladesh's total CO<sub>2</sub> emissions in 2020.

All of these plants were already in construction at the time of Xi's announcement, and have generally completed the main infrastructure of the plant. Most are located in South and Southeast Asian countries — Indonesia (7.8 GW or 9 plants) leads to add 935 million, followed by India (3.4 GW), Pakistan (2.6 GW or 296 million lifetime CO<sub>2</sub>) and Vietnam (2.5 GW) — which hosts the largest pipeline of Chinese backed overseas coal.

While it is unlikely that these projects can be stopped, it remains important to ensure that the coal plants are not allowed to operate without consequence. A closer look at the projects show that many are being built to environmental standards and technological efficiency much lower than China requires for its domestic coal. In line with the Guideline recommendations released by the NDRC earlier this year, efforts to upgrade the technologies to minimize their carbon footprint and pollution are needed. These plants must be required to adopt the highest level of efficiency and meet international best practices to minimize their CO<sub>2</sub> and pollution emissions.

<sup>6</sup> [https://www.gem-wiki/Phulbari\\_power\\_station\\_'China\\_Gezhouba'#cite\\_note-8](https://www.gem-wiki/Phulbari_power_station_'China_Gezhouba'#cite_note-8)

<sup>7</sup> [https://www.morningstar.co.uk/uk/news/AN\\_1647025947582392500/in-brief-gcm-resources-extends-powerchina-jv-deal-by-two-years.aspx](https://www.morningstar.co.uk/uk/news/AN_1647025947582392500/in-brief-gcm-resources-extends-powerchina-jv-deal-by-two-years.aspx)

*Table 4: China-backed Coal Plants in late stage construction and likely to be built despite China's ban on overseas coal*

<b>COUNTRY</b>	<b>PLANT</b>	<b>TOTAL CAPACITY (MW)</b>	<b>ESTIMATED LIFETIME CO<sub>2</sub> (MILLION TONNES)</b>
<b>Bangladesh</b>	Banshkhali (S Alam) Unit 1 & 2	1836	160
	Barisal	350	48
<b>Cambodia</b>	Sihanoukville CIIDG 2 Unit 1 & 2	700	78
	Sihanoukville SEZ Unit 2	50	6
<b>India</b>	Adani Godda Unit 1 & 2	1600	208
	KSK Mahanadi Units 4-6	1800	246
<b>Indonesia</b>	Bangko Tengah (SS-8) Unit 1 & 2	1200	140
	Banten Suralaya Units 9 & 10	2000	213
	Delong Nickel Phase III Unit 2-7	810	118
	Nagan Raya Unit 3 & 4	400	53
	PT Halmahera Persada Lygend Nickel Smelter Phase II Units 3-6	600	75
	Sulawesi Mining Phase 5 Units 1-3	1080	124
	Sumsel-1 Unit 1 & 2	600	81
	Wanxiang Nickel Indonesia Unit 1 & 2	130	17
	Weda Bay Unit 5, 7 & 8	1010	116
<b>Pakistan</b>	Jamshoro Unit 5	660	68
	ThalNova	330	42
	Thar Block I Unit 1 & 2	1320	143
	Thar Energy Limited	330	44
<b>Philippines</b>	Concepcion Unit 2	135	20
	Dingin Unit 2	668	79
<b>Serbia</b>	Kostolac B3	350	47
<b>South Africa</b>	Kusile Unit 5 & 6	1589.6	167
<b>Turkey</b>	EMBA Hunutlu Unit 1 & 2	1320	174
<b>Vietnam</b>	Thai Binh-2 Unit 1 & 2	1200	154
	Van Phong-1 Unit 1 & 2	1320	149
<b>Zimbabwe</b>	Hwange Unit 7 & 8	670	80

**TOO LATE:**  
Began operations (CO<sub>2</sub> to be emitted)

Lastly, 7.6 GW or 14 coal plants with Chinese financing and/or EPC support have entered into operation since President Xi's announcement in 2021. They will add 1.04 billion tonnes of CO<sub>2</sub> into the atmosphere if they are allowed to operate until 2050, emitting an additional 36 million tonnes of CO<sub>2</sub> annually.

This category of plants has the smallest share, highlighting the huge potential that China's ban still has to avoid new plants and the CO<sub>2</sub> that would result from their construction and commission. All the countries where plants have been operationalized in the last year face overcapacity issues as a result of dependence on coal generation. In addition, past coal development has been heavily supported by international financing. Pledges by South Korea, Japan and China to halt their overseas coal support affect the viability of new and proposed coal plants. Rather than push such projects forward, the plants projects in the last two sections of this report must be the last capacity additions for Chinese coal overseas.

Indonesia has the highest capacity of Chinese-backed plants moving forward despite the ban on overseas coal, and also retains the highest capacity of coal plants that are expected to enter operation following the ban. Over 3.4 GW have already been commissioned, and are likely to add 540 million tonnes of CO<sub>2</sub> until 2050. Notably, 3 GW are considered captive power for industrial nickel parks which are also backed by China through the BRI, and should be subject to China's pledge to green development overseas.

*Table 5: China-backed Coal Plants that entered into operations since September 2021*

COUNTRY	PLANTS	TOTAL CAPACITY (MW)	ESTIMATED LIFETIME CO <sub>2</sub> (MILLION TONNES)
Indonesia	Bengkulu Unit 1 & 2	200	31
	Delong Nickel Phase II Units 1-10	1645	239
	Ketapang Smelter-2 Unit 1 & 3	110	15
	Nanshan Industrial Park Phase I Units 1-3	80	13
	Sulawesi Mining Phase 3 Unit 1 & 2 and Phase 4 Unit 1 & 2	1000	187
	Sulbagut-1 Unit 1 & 2	100	15
	Sulut-3 Unit 2	50	7
	Weda Bay Unit 6	250	35
Mongolia	Erdenet power station	50	11
Pakistan	Port Qasim Lucky power station	660	75
Philippines	Dingin Unit 1	668	79
South Africa	Kusile Unit 4	794.8	82
	Medupi Unit 1	794.8	94
Vietnam	Duyen Hai-2 Unit 1 & 2	1200	152

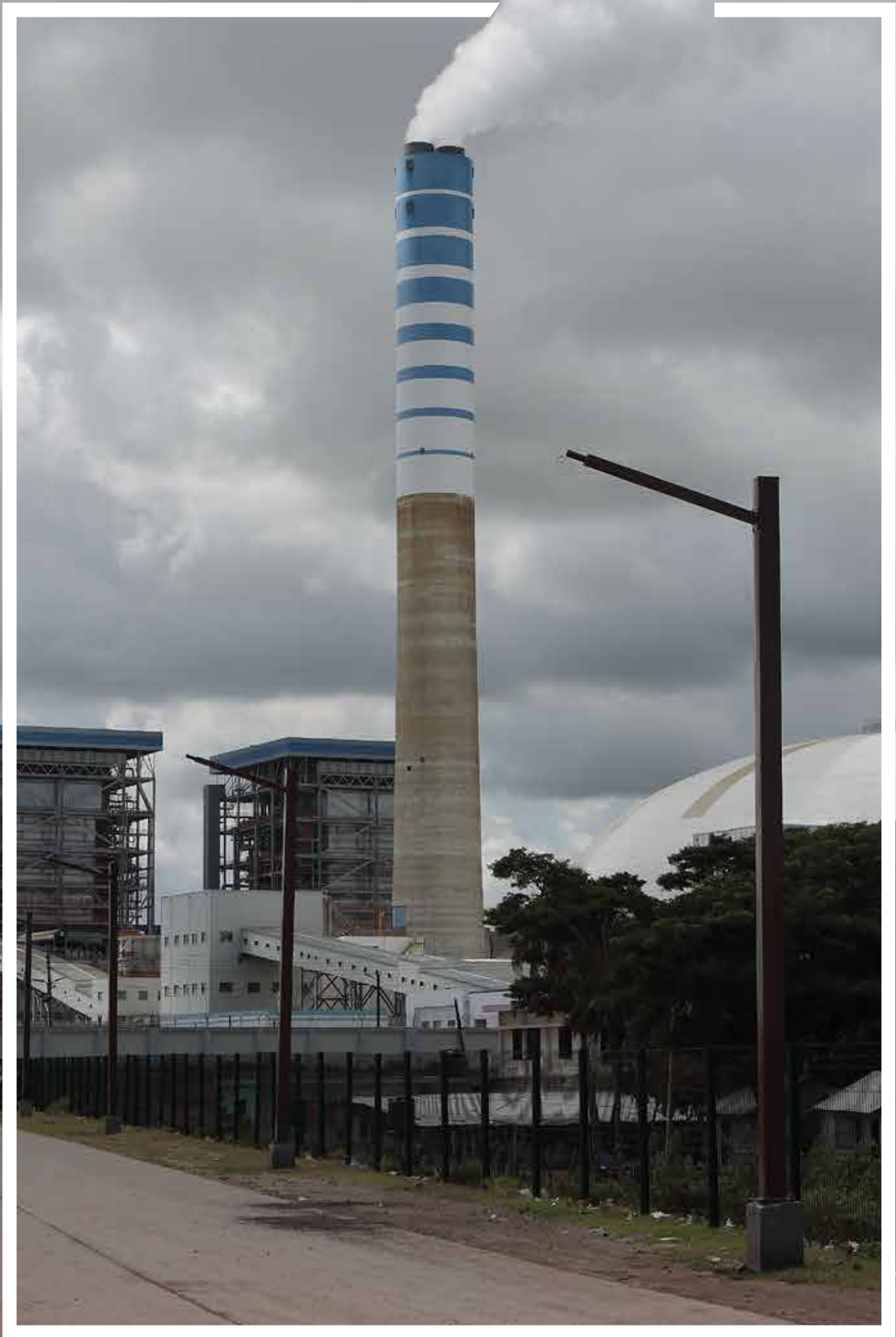


Photo: Salman Saeed

## Recommendations

As it did a year ago, China's commitment to stop new coal is an opportunity to move towards a more sustainable future. Chinese and host country governments and financial institutions need to cancel the pipeline of coal project identified in this report, and pivot to increasing investments in renewable projects to mitigate losses in coal assets and avoid additional CO<sub>2</sub> emissions.

Many of the host countries subject to additional coal with Chinese backing have signed onto the Just Transition Agreement to phasedown coal by 2050, it remains important that power development plans remove plans for new additional coal, and focus on the development of low-carbon technologies and grid improvements. The countries with the highest potential to avoid CO<sub>2</sub> emission from new Chinese coal power plants are ones that face the challenge of transitioning their fossil fuel dominated power mixes: Indonesia, Bangladesh, Vietnam, Pakistan, Turkey, South Africa, and the Philippines. For most of these countries, the likelihood that all new coal will not only add unnecessary CO<sub>2</sub> into the atmosphere but also expose stakeholders to high risks of stranded assets is high. Coal plants are already underutilized in countries like Bangladesh and Indonesia.

Ambitious capacity targets, policies and investment decisions by host countries should harness the cost-competitiveness of renewables and unlock critical project funding. Governments need to ensure that complicated procedures to build renewables support progress, particularly for countries where solar and wind remain relatively nascent.

Financiers should initiated cancellations or renegotiations of projects to convert them to RE. These stakeholders, particularly equity investors, will hold coal plants for an increasingly uncertain lifetime; banks will need loan repayments for 10-15 years on average; and utilities in host countries will need to add renewables en masse to meet decarbonization targets as well as reduce exposure to global fuel prices.

Both Chinese and host countries developers will be faced with increasing stranded assets risks as countries start to decarbonize, and the economics of new coal continues to decline. Chinese banks and companies still dominate the coal power plant investments, especially in South and Southeast Asian countries. It also falls on banks, both Chinese and host countries, to not to underwrite or provide loans on any coal project proposals that come on their desk; moving forward, they must also commit remove coal from their portfolios.

The government of China must also move to ensure that no new coal contracts be approved, and encourage overseas investments be made towards solar and wind. For the NDRC, MEE and MOFCOM, it will be necessary to tighten the approval process for overseas power projects and make clear to both public and private entities that coal projects have no part in a green Belt and Road Initiative. The 4 new EPC contracts signed after September 2021 highlight the necessity of checking ALL the coal power plant deals to ensure pledge is NOT breached.

China's pledge to support green development alongside the halt in new coal is a crucial pillar to its future overseas investments and could channel the necessary investment toward renewables in emerging economies. China has some of the highest solar and wind capacity in operation today, and should lead on its technology transfer.

The investment needed to capitalize on a green energy transition is huge, but so are the avoided costs, which have the potential to yield important socio economic benefits. In 2021, the 109 GW of renewable additions in non-OECD countries, with lower costs than the cheapest coal-fired power plant, is estimated to save the power sector at least \$5.7 billion annually over their project lifespan.<sup>8</sup>

Rather than follow coal to its grave, critical financing and support from China and within host countries should be focused on equipping stakeholders and communities with the capacity and technologies to support a rapid and equitable global energy transition.

## MATERIALS AND METHODS

In this report, only direct (Scope 1) CO<sub>2</sub> emissions associated with electricity consumption is estimated.

For each coal plant unit, carbon dioxide emissions was calculated based on the following information:

- ◆ Unit capacity
- ◆ Emission factor (pounds of carbon dioxide per million Btu) for each type of coal
- ◆ Heat rate for each combustion technology (Btu/kWh), adjusted for quality of coal
- ◆ Capacity factor based on the actual utilization rate of coal plants in each country in 2021.
- ◆ Years of operation (for lifetime emissions calculation). New coal plants' operating life is assumed to be cut short by 2050, in line with the IEA and IPCC reports that unabated coal in developing countries will need to be phased out by 2050. If an estimated start year was not available in the GEM database, 2025 was assumed to be the start date for projects in the permitting, pre-permit or announced stages.

With the exception of the capacity factor and years of operation, per plant information was based on the Global Coal Plant Tracker databased. Further details can be found at [Estimating Carbon Dioxide emissions from Coal Plants on GEM.wiki](#).

<sup>8</sup> IRENA- Renewable Power Generation Costs in 2021



Photo: Salman Saeed

