



Testimony before the U.S.-China Economic and Security Review Commission China's Energy Plans and Practices

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Introduction and Summary

In order for countries to meet global collective targets such as the Paris Agreement and the Sustainable Development Goals, a dramatic scaling of infrastructure financing on the order of 2 percent of global GDP will need to be mobilized each year through 2030.¹ Taking the case of renewable energy, in order to achieve net zero emissions by 2050, annual capacity additions will need to achieve a pace five times higher than the recent average growth rate. This creates an investment gap in renewable energy alone of around \$22.5 trillion through 2050, or \$700 billion per year.²

Global demand for infrastructure investment is far greater than what the U.S., its allies, and multilateral development banks (MDBs) have been interested in or capable of fulfilling. The resulting infrastructure gap, particularly for energy infrastructure in developing countries, means that many developing countries are eager for new infrastructure investment projects. It is in part thanks to this local demand that China has emerged as a major provider of international debt, equity, and other forms of support for infrastructure development.³

This testimony assesses trends in Chinese engagement in the global energy sector and the drivers behind these trends. First, I assess overall trends. I focus on China's overseas development finance for energy infrastructure, which, despite declining in recent years, has historically far exceeded Western development finance. In contrast, China's foreign direct investment (FDI), that is, provision of equity investment from Chinese companies, has remained relatively constant in the energy sector, with an increasing trend towards the electricity sector and transmission and distribution projects. Finally, I focus on China's engagement in overseas power generation infrastructure, showing how coal has been the largest destination for Chinese development finance and FDI in overseas power generating capacity.

Next, I place these trends in the context of China's overseas carbon footprint and explain why carbon-intensive energy infrastructure has been favored. Over two-thirds of China's overseas energy development finance is in fossil fuel-related activity. Host countries play a large role in directing Chinese infrastructure support. Within China, trends in domestic coal capacity have played a large role in increasing policy bank support for China's coal enterprises and equipment and service providers in going overseas. Altogether, the emissions associated with China's fossil-

based overseas power generating infrastructure could reach over 300 million tons of carbon dioxide emissions per year, or even as high as 600 million tons per year if all future plants come online and contracting arrangements for overseas coal plants are considered in addition to capital provision, an amount nearly equal to Canada's annual energy-related carbon dioxide emissions. However, it is important to note that within all public and private finance for overseas coal plant development in recent years, China is only responsible for 13% of generating capacity,⁴ and in addition, there is evidence that China's coal plants are relatively more advanced in terms of emissions intensity and therefore technology quality.⁵

In contrast, China's support for overseas renewable energy development has been at very low levels, but growing in recent years, driven by foreign direct investment. China's policy banks remain wary of financing renewable energy, and host countries have yet to significantly increase demand for renewable energy. In September 2021, Xi Jinping announced at the 76th United Nations General Assembly that China would increase support for low-carbon energy in developing countries and not build new coal-fired power projects abroad. It remains to be seen if this announcement will drive a major shift in the composition of China's overseas power sector engagement and a scale-up of renewable energy development. Like the case for coal, host country policies also play a major role in directing Chinese support.

Considering this analysis, and the pressing need for infrastructure finance to meet climate and sustainable development goals, I outline policy recommendations for the U.S. in two key areas. First, the U.S. must increase the scale of its overseas energy engagement and direct the composition of this engagement towards clean energy, to no longer lag behind China and to lead by example in achieving global collective goals. Second, the U.S. must leverage its decades of experience to expand technical assistance and capacity building activities with countries seeking infrastructure finance, especially in the realm of clean energy. In addition to bilateral channels for scaling up finance and cooperation, the Build Back Better World (B3W) Partnership is also a key opportunity for the U.S. to increase the scale of global infrastructure development and set policies that move this development towards clean energy.

Trends in China's Overseas Energy Infrastructure Engagement

To assess trends in energy infrastructure projects around the world that have received support from China, it is first critical to define the ways in which Chinese actors channel this support. China is not a monolithic entity; rather, China's overseas energy infrastructure engagement is channeled by a diverse range of actors with varying motivations.

My research has focused on several channels through which China supports overseas energy infrastructure development, including development finance, commercial finance, FDI, and export services in the form of contracting. Based both on my research background and the relative weight of these areas in China's overall overseas energy engagement, the below sections focus on China's overseas development finance and FDI, as well as China's engagement in overseas

power generation infrastructure. I define these channels of engagement, summarize noteworthy trends and identify the actors involved.

Overseas Development Finance

China's official overseas development finance is defined as lending commitments from China's two policy banks, the China Development Bank (CDB) and the Export-Import Bank of China (CHEXIM), to overseas borrowers with public ownership. These two banks were capitalized in 1994 and are solely owned by the Chinese government under the direct leadership of the State Council. CDB was initially designed to primarily assist with domestic infrastructure priorities, but has transformed since the 2008 global financial crisis into the one of the world's largest overseas lenders. CHEXIM is tasked primarily to facilitate the country's foreign trade and foreign economic cooperation, and it provides finance to Chinese energy companies primarily in the form of export credits, credit guarantees, and concessional loans.⁶ While initial mandates focused on domestic and overseas infrastructure development respectively, these two banks have coordinated with Chinese commercial banks, state insurance provider Sinosure, and government ministries to enable overseas projects in strategic areas and sectors, a model termed the strategic or coordinated credit space.⁷ This model has driven the rapid takeoff of China's overseas development finance since 2008 to a level that is on par with World Bank lending (Figure 1).⁸

Taking the above definition, the Boston University Global Development Policy Center's China's Overseas Development Finance (CODF) Database shows that for all sectors, China's overseas development finance amounted to 858 loans totaling \$460 billion between 2008 and 2019.⁹ The energy sector has been the dominant destination for this finance, receiving 273 loans totaling \$225 billion over that same time period.

Looking at the energy sector over broader time period, from 2000 until the end of 2021, the Boston University Global Development Policy Center's China's Global Energy Finance (CGEF) Database shows that China has provided \$235 billion in development finance for the overseas energy sector, with most of this lending concentrated in the years 2008 to 2019.¹⁰ Putting this in context, China's policy banks have provided as much overseas lending as all the major Western-backed multilateral development banks (MDBs) combined, tripling the amount of energy financing available to national governments over the time period tracked in our database.¹¹

Despite this boom, it is important to note that China's overseas development finance for energy infrastructure has continually decreased since 2016 (Figure 2), reflecting an overall decline in China's overseas development finance in recent years. This decline has been driven by a variety of factors. First, although host countries face a pressing need for more infrastructure, many have hit bottlenecks in the ability to absorb new projects, especially as external debt grows to unsustainable levels. Second, within China, slowing economic growth and dwindling current account surpluses have limited the amount of dollars for outward finance. Even before the pandemic, Chinese regulators tightened the reigns on domestic and overseas financing by

strengthening financial regulations and emphasizing prudent and sustainable lending.¹² In 2021, China provided no new development finance for energy-related projects, with the prior factors exacerbated by the economic effects of the COVID-19 pandemic.

Regarding the energy activities that China's development finance has supported, power generation has received the largest share of lending (\$110 billion), followed by exploration and extraction (\$71 billion) and transmission and distribution (\$39 billion), with the remainder going towards multipurpose projects and energy efficiency-related activities.

Foreign Direct Investment

Given the recent decline in China's overseas development finance for the energy sector, and across all sectors, it is important to note that China's overseas energy engagement is far from gone – it has to some extent shifted towards other channels, including commercial lending from Chinese commercial banks, provision of equity in the form of FDI, and export services in the form of contracting. This section covers Chinese companies' FDI in the overseas energy sector.

Even though China's annual energy sector FDI has also decreased in general in the past few years, on average, China's energy sector FDI has remained much more stable than development finance. FDI can be further classified into greenfield FDI for new projects, and mergers and acquisitions (M&A) for existing projects. Greenfield investment represented a larger share of FDI than M&As in 2018, 2019, and 2020. Due to the COVID-19 pandemic, China's overseas energy sector development finance and greenfield investment were dramatically reduced relative to prior years in 2021, but M&As remained at a constant level of roughly \$6 billion per year (Figure 3).

An additional trend is the growing importance of the electricity sector in China's overseas FDI. Investments in coal, oil, and natural gas exploration, extraction, and transportation activities have decreased since 2015, making the electricity sector the primary destination for China's energy FDI, largely driven by M&As. Within the electricity sector, transmission and distribution rather than power generation has been a focus of these M&As in the past three years.

China's Overseas Engagement in Power Generation Infrastructure

As noted above, the power sector has received the largest share of China's overseas energy sector development finance to date. The power sector is also a major recipient of loans from Chinese commercial banks and equity investment from Chinese companies. In addition, Chinese engineering and construction companies may be contracted by overseas project developers to provide equipment, procurement and construction (EPC) services or other types of construction and operation arrangements, such as Build-Operate-Transfer (BOT). Given the importance of the power sector in China's overseas energy engagement, this section breaks down the channels through which China has been involved in overseas power plant development. For analyzing this

sector, it is helpful to use the generating capacity of power stations as a unit of comparison (in megawatts, MW, or gigawatts, GW), rather than dollar value of lending or investment, based on both data availability and relevance for environmental impact.

According to the Boston University Global Development Policy Center's China's Global Power (CGP) Database, which tracks China's overseas development finance and equity investment in the form of FDI, China has supported 557 overseas power plants representing 106 GW of generating capacity through these channels since 2000.¹³ FDI supported the majority of this capacity, at 57 GW, with CDB and CHEXIM providing development finance for 42 GW of capacity. A small amount of capacity, 6 GW, was co-financed with both Chinese development finance and FDI. However, by number of projects, 81 percent of the projects are supported by FDI, while 23 percent involve debt financing from Chinese policy banks, with a 4 percent overlap. This shows the policy banks have been investing in much larger projects by capacity than FDI, and this has been heavily weighted towards coal and hydropower projects.

It is also important to note that there is also a significant amount of pipeline capacity in the form of plants that are under construction or are planned to receive Chinese development finance and/or FDI. Forty-three GW are currently under construction, while 37 GW are under planning. For plants that are under planning, plans may change frequently, and this estimate represents the CGP Database's assessment based on best available information as of mid-2019. High-level policy announcements, such as Xi Jinping's statement in 2021 that China would not build new coal plants overseas,¹⁴ may affect planned plants.

Power sector FDI is heavily concentrated in several Chinese companies. Among the 63 Chinese companies that have participated in FDI in the power generation sector, the top ten companies have contributed to 77 percent of the total capacity. These top ten companies are: China General Nuclear Power Group, China Three Gorges Corporation, China Huaneng Group, State Power Investment Corporation, PowerChina, State Grid, China Huadian Corporation, Shenhua Group, China Datang, and Canadian Solar. Except for Canadian Solar, which is one of China's biggest solar companies, nine of the top ten investing companies are state-owned enterprises, and are also among the biggest power companies in China.¹⁵ Besides Canadian Solar, which has been investing solely in solar power, all other top ten companies are investing in multiple energy sources. Companies such as China Three Gorges and Shenhua, which have specific technology focuses, do have FDI portfolios more concentrated on their area of expertise (hydropower and coal, respectively).

China's Overseas Carbon Footprint

China's overseas energy sector engagement to date has been heavily weighted towards fossil fuels. According to the CGEF Database, more than two-thirds of China's overseas energy sector development finance has gone towards fossil fuel-related projects, with oil (\$75.8 billion) and coal (\$51.6 billion) receiving the largest shares.

For power generation specifically, looking at both development finance and FDI, China has channeled support to 65 GW of fossil fuel-based generating capacity out of 106 GW capacity. Coal has received the largest share (41 GW) (Figure 4) and is highly regionally concentrated in Southeast Asia (40 percent), South Asia (31 percent), and Africa (16 percent). Development finance and FDI differ in the types of generating capacity they have tended to support; Chinese policy banks contributed to 73 percent of overseas coal power generation capacity tracked in the CGP Database, while most gas-fired power plants and renewable power generation projects were supported by FDI.

For overseas power plants that are planned and under construction, 40.6 GW are fossil-based, out of a total of 80 GW (50.8 percent).¹³ Although the future share of fossil-based generation receiving Chinese capital may decrease, most power plants have a decades-long lifetime, and thus will continue emitting carbon dioxide (CO₂) decades into the future.

Overseas fossil-fuel based power plants receiving Chinese development finance and FDI are currently leading to approximately 314 million tons (Mt) of CO₂ emissions per year, which is about 3.5 percent of the annual CO₂ emissions from the global power sector outside of China. Assuming no retirement by 2030, cumulative CO₂ emissions from 2018 onward from these fossil fuel power plants will reach approximately 5.9 Gigatons (Gt), which would consume 1.3 percent of the global carbon budget for a 66 percent chance of limiting global warming to 1.5 degrees Celsius, according to the Intergovernmental Panel on Climate Change (IPCC) Special Report.¹⁵

Overseas Coal Power Plants

China's overseas support for the development of coal-fired power plants is particularly important based on the information discussed above – coal represents the largest share of China's development finance and FDI for overseas power generating capacity, and the second largest share by dollar amount for China's overseas energy development finance. In addition, China's overseas coal plants will operate for decades to come – the oldest plant tracked in our CGP Database is from 2003, less than 20 years old, with the majority built in the past decade.

In September 2021, Xi Jinping announced at the 76th United Nations General Assembly that China would increase support for low-carbon energy in developing countries and not build new coal-fired power projects abroad. Although a clear commitment to greening China's overseas activity, the wording of the announcement left significant room for interpretation. My recent policy brief quantified the potential range of coal generating capacity that could be affected by this announcement.¹⁶ In addition to development finance and FDI, I also estimated China's support for future coal plants through Chinese commercial banks and contracting arrangements.

For capital provision, I found that Chinese policy banks, commercial banks, and companies are supporting a total of 23.5 GW of coal plants under construction and 18.4 GW of coal plants under planning.¹⁶ These institutions' support for overseas coal plants is further broken down below, and summarized in Figure 5.

China's policy banks and their development finance have supported 29.6 GW of currently operational coal plants around the world since 2000. Another 9.3 GW are under construction and 3.9 GW are under planning. Including co-financed arrangements between Chinese policy banks and Chinese companies, these numbers are 33.5 GW of currently operational plants, and 16.5 GW of plants under construction.

Between 2011 and 2020, Chinese commercial banks supported 8.3GW of coal-fired power generating capacity abroad (excluding those co-financed with CDB and CHEXIM and with Chinese FDI). Another 3.9 GW are under construction and 4.9 GW are under planning. Much of the capacity under planning is associated with the Bank of China, which announced in late 2021 that it would not finance new coal mining or coal power projects abroad.¹⁶

Chinese companies have provided greenfield FDI to 3.3GW of operating coal plants overseas, 3.1GW of coal plants under construction and 9.6GW of planned plants (not including plants with both FDI and Chinese policy bank finance). Chinese companies have invested in 4.2GW of already-existing coal plants via M&As. There are also 3.8GW of already operating plants, and 7.2GW of plants under construction that had capital participation of both Chinese policy banks and Chinese companies.

I also found that Chinese companies providing engineering and construction services, such as through EPC contracts, represent a larger amount of overseas future coal capacity than for the capital arrangements discussed above. The capacity associated with construction arrangements alone (with no associated Chinese finance) is roughly 27 GW of coal plants under construction, and 32 GW under planning.

Taken together, the emissions associated with the capital as well as construction arrangements could amount to nearly 600 million tons of CO₂ per year, if all these plants came online.

However, it is critical to place these findings in the context of other developers of coal-fired power plants and their relative financial flows and technology quality.

First, Chinese policy banks, commercial banks, and companies are responsible for only a small share of recent coal plant development, relative to Western institutional investors. While it is true that China is the largest public (i.e., development) financier of overseas coal plants, with its two policy banks providing \$15.6 billion, or 50 percent of global public finance commitments in overseas coal fired power plants that reached financial closure between 2013 and 2018 (40 percent by generation capacity), the inclusion of private finance paints a drastically different picture: 87 percent of public and private finance for overseas coal plants is funded by entities

outside China. Chinese policy banks, commercial banks, and companies financed 32 GW of overseas capacity, accounting for just 13 percent of the coal power capacity outside China that was operational or under development over that same time period.⁴

Second, empirical evidence from my research on coal plants in Asia indicates that those with Chinese parent, engineering, and/or construction companies have relatively lower CO₂ emissions intensity, compared to similar plants with non-Chinese parent, engineering, and/or construction companies.⁵ This indicates that Chinese companies may play a role in providing relatively more efficient or high quality technology, even as absolute emissions associated with coal plants remain a serious issue for climate change and air pollution.

Drivers of China's Overseas Fossil Fuel Infrastructure Development

To analyze the factors driving the kinds of energy Chinese institutions support overseas, it is useful to classify these drivers into a “supply push, demand pull” framework. Supply push refer to factors within China that determine overseas engagement choices. Demand pull refers to factors in host countries and on the part of decision-makers in those countries that determine energy choices related to Chinese engagement. To some extent, prior discourse has underplayed the role of host countries, which play a key role in shaping what types of energy Chinese actors finance and invest in.¹⁷

For coal-fired power plants, from the perspective of demand pull, many host countries where coal plants have been built with Chinese support are highly dependent on foreign capital for infrastructure development. With China as the leading provider of energy development finance, as discussed above, as well as the gradual and systematic withdrawal of MDBs and leading Organization for Economic Co-operation and Development (OECD) bilateral financiers from coal finance, host countries turned to China's policy banks to meet growing needs for increasing electricity generation. In some cases, host countries have preferential policies for coal plant development, and lack an enabling policy environment for renewable energy.¹⁸ Large coal resource endowments in certain countries also play a large role in seeking external support for coal plant development, such as in Pakistan.¹⁹ Another driving factor for this turn to China is the lack of technological know-how for the installation of large-scale generation capacity, with up to 60 percent of coal power capacity additions outside of China from 2010 to 2015 relying on imported equipment.²⁰

These demand pull factors are highly aligned with supply pushes from within China's coal industry. Since the 2008 global financial crisis, Chinese coal companies faced a shrinking domestic development space, due to economic slowdown and shifting environmental policy within China. At the same time, domestic overcapacity in coal-fired power generation became an increasing challenge, one that continues today. Researchers from the Boston University Global Development Policy Center identify 2013 (also the year the Belt and Road Initiative (BRI) was announced) as a turning point in Chinese leaders' strategy towards facilitating overseas coal

plant development. Previously, overseas coal plant development was largely industry-led from major coal state-owned enterprises (SOEs), which operate with support from China's policy banks in the coordinated credit space model discussed above. However, in 2013, Xi Jinping highlighted the specific role overseas development could play in relieving excess production capacity, leading to subsequent policies on promoting China's equipment manufacturing sector (particularly for coal) in accessing overseas markets.¹⁷

While not a fossil fuel, hydropower has also been a major destination for Chinese finance, investment, and contracting in the overseas energy sector, and reflects many similar trends in the push-pull framework as China's overseas coal story.²¹ Particular to hydropower plants in the Greater Mekong Subregion with support from Chinese companies, many plants have cross-border electricity export arrangements for supply to China.²²

China's Overseas Renewable Energy Development

According to the Boston University Global Development Policy Center's CGP Database, renewable energy in the form of wind and solar generating capacity has accounted for 11 percent of total capacity supported by Chinese overseas development finance and FDI. By number of projects, this share is higher, at 17 percent, which makes sense because renewable energy projects tend to be much smaller in capacity than fossil fuel and hydropower plants.

As mentioned above, FDI on the part of individual companies has been a key channel for Chinese support of overseas renewable energy development, far dwarfing development finance. Of the 63 companies tracked in the CGP Database, 34 are investing purely in renewable energy (including hydropower). Over half of them are private companies. This shows that even though investing in small volumes, a more diverse range of Chinese companies, including both private firms and SOEs, are investing in renewable energy overseas.¹⁵

Focusing on China's greenfield FDI in overseas power generation, since 2014, greenfield FDI in alternative/renewable energy on average has nearly doubled the amount of annual investment in previous years. Fossil fuel power generation peaked in 2015 (Figure 6).

Drawing again from the supply push, demand pull framework to analyze the drivers of China's overseas renewable energy (henceforth wind and solar only) finance and investment, such finance is constrained by lack of enabling factors on the part of both China and host countries. The small amount of development finance that has been channeled to overseas renewable energy development (13 projects, according to the CGP Database), has primarily been driven by demand from host countries, including direct requests for assistance from the governments of Ethiopia, Kenya, Argentina and Pakistan.²³ Beyond development finance, many host countries face a web of actors with objectives that strongly favor fossil-based power development, especially coal, leading to weak demand for renewable energy when it comes to engagement with China.²⁴

Chinese development finance for renewable energy has also been constrained by perceptions on the part of China's policy banks that renewable energy projects have high bankability risks. This perceived bankability risk has led policy banks to turn away from small and distributed renewable energy projects, which are also seen to face technical and infrastructural bottlenecks in developing countries. Finally, the Chinese policy banks worry about financial risks, including profitability and future cash flows from renewable projects.²³ Taken together, these factors – whether real or perceived – limit the likelihood of China's policy banks approving loan applications or seeking out opportunities for engagement with host countries on renewable energy development.

However, a major policy shift may be at hand, following increasing narratives of a green BRI and the provision in Xi Jinping's September 2021 announcement that China would increase support for low-carbon energy in developing countries and not build new coal-fired power projects abroad. Depending on how this announcement is interpreted and executed, state support for renewable energy development overseas could increase.

Policy Recommendations

The major differences in approach and scale of Chinese engagement in overseas energy infrastructure warrants a response from the U.S. government, which is also a player in global infrastructure development and shares collective goals with China and developing countries in achieving Paris Agreement targets and the Sustainable Development Goals.

Based on the above trends and determinants in China's overseas energy engagement, the U.S. policy response should focus on 1) increasing the scale of U.S. overseas energy engagement and directing the composition of this engagement towards clean energy and 2) expanding U.S. cooperation with countries seeking infrastructure finance, especially in the realm of clean energy.

First, given the global infrastructure finance and investment gap, and the relative scale of Chinese development finance, the U.S. should support calls for a capital increase in the multilateral development banks that it participates in, as well as a renewed and increased commitment for infrastructure support overseas through bilateral development finance channels, particularly for clean energy. The U.S. has a number of development financing institutions that can channel this support, including the Development Finance Corporation, USAID, EXIM, the Millennium Challenge Corporation, and the U.S. Trade and Development Agency. The Department of Energy can provide expertise and technical assistance, while overall interagency coordination can be improved with the goal of increasing the scale of U.S. clean energy support overseas. Given President Biden's recent announcement of the Build Back Better World (B3W) Partnership, there is also a clear policy opportunity to clarify and define B3W's future overseas activities, set goals for engagement in clean energy, and work with global partners to increase the scale of this activity.



The U.S. should focus not only in the scale of infrastructure finance, but also the composition. The U.S. has an opportunity to lead by example in opening a path for a new generation of sustainable, low-emissions energy infrastructure that could stand in contrast to the fossil-heavy portfolio of China's overseas energy engagement. In addition, the U.S. should align its overseas energy financing with domestic energy development trends. Since 2010, two thirds of added generating capacity domestically within in the U.S. has been in the form of wind and solar renewable energy; however, the overseas generating capacity receiving U.S. bilateral finance and investment has been two thirds fossil fuels.²⁵ Aligning the composition of U.S.-supported overseas energy infrastructure with what is being done domestically will support climate goals and provide opportunities for U.S. renewable energy businesses to go overseas.

Second, the U.S. should engage in technical assistance and capacity building through bilateral and regional partnerships focused on energy development in countries seeking overseas infrastructure finance. In contrast to China, the U.S. has long-term relationships and decades of experience working with host countries to provide technical assistance and capacity building. It is critical for the U.S. to bilaterally help countries formulate policies and devise incentives for renewable energy, as well as build the regulatory and institutional capacity to support these policies. Existing examples include regional programs, such as Power Africa, the Mekong-U.S. Partnership and the Japan-U.S.-Mekong Power Partnership. As an example, given Chinese dominance of hydropower development in the Mekong region, U.S. efforts should focus on renewable energy alternatives to hydropower. In the power sector, U.S. technical expertise can assist host countries in identifying low-cost, reliable electricity planning options that deploy renewables, as well as developing enabling policy environments for renewable energy deployment. Doing so could both address climate change and provide opportunities for U.S. renewable energy developers.

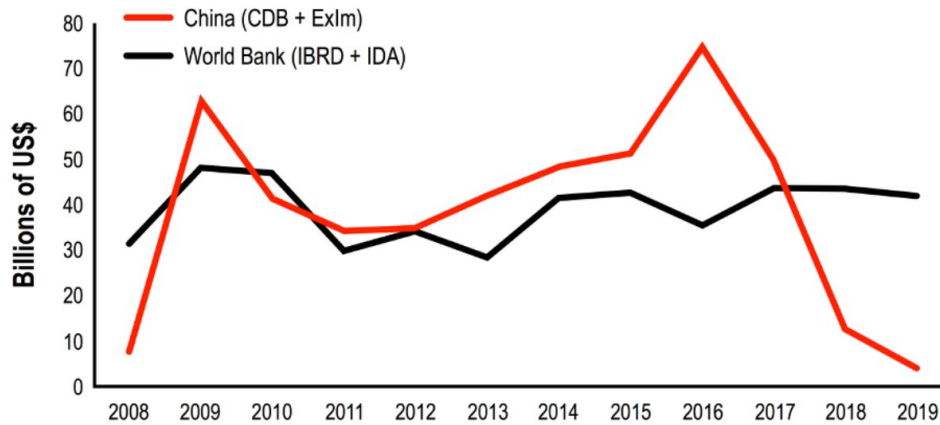
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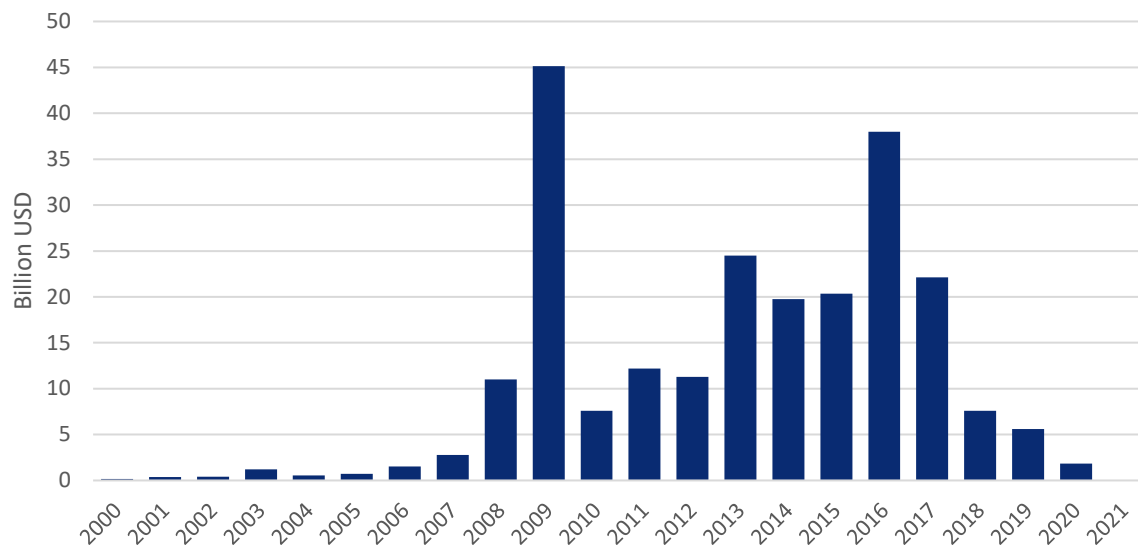
Figures

Figure 1: China and World Bank Annual Overseas Development Finance, 2008-2019



Source: Ray et al. 2021.

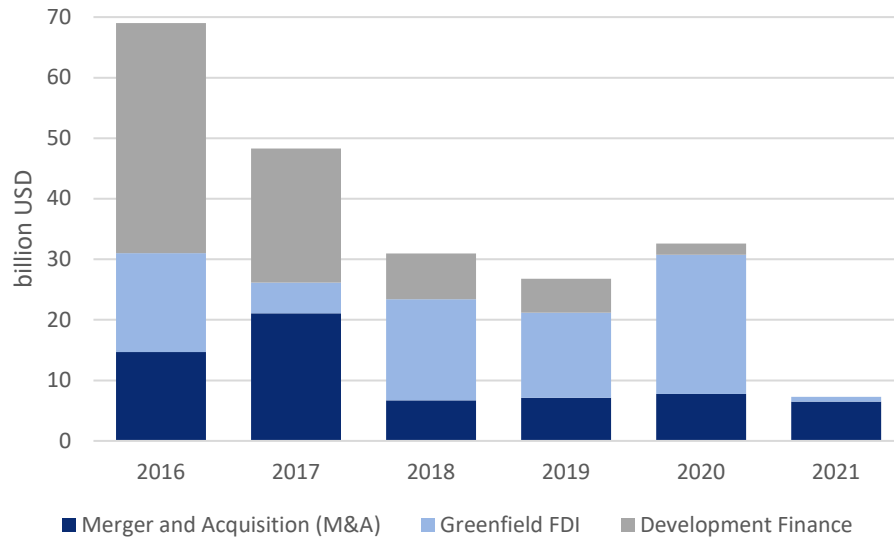
Figure 2: China's Annual Overseas Energy Finance from Policy Banks, 2000-2021



Source: China's Global Energy Finance (CGEF) Database, 2022. Boston University Global Development Policy Center.

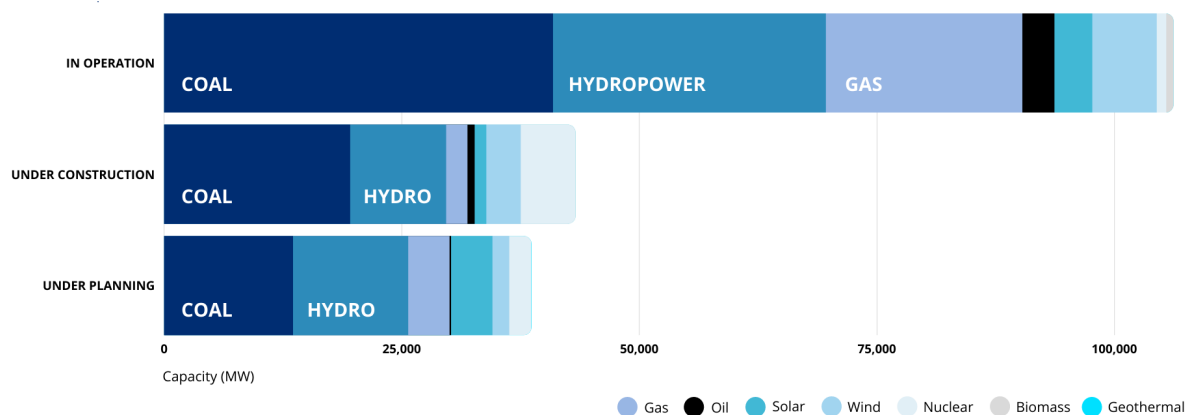


Figure 3: China's Overseas Energy Investment and Development Finance, 2016-2021



Source: Dealogic, 2021; fDi Intelligence, 2021; China's Global Energy Finance (CGEF) Database, 2022. Boston University Global Development Policy Center.

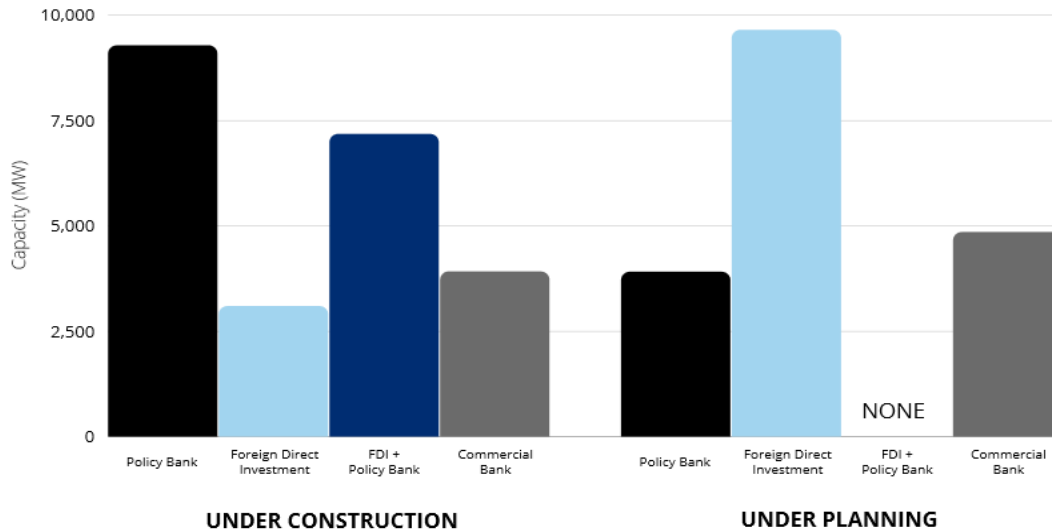
Figure 4: Overseas Power Generating Capacity Receiving Chinese Development Finance and FDI by Fuel Type, 2000-2019



Source: China's Global Power Database, Boston University Global Development Policy Center, 2020.

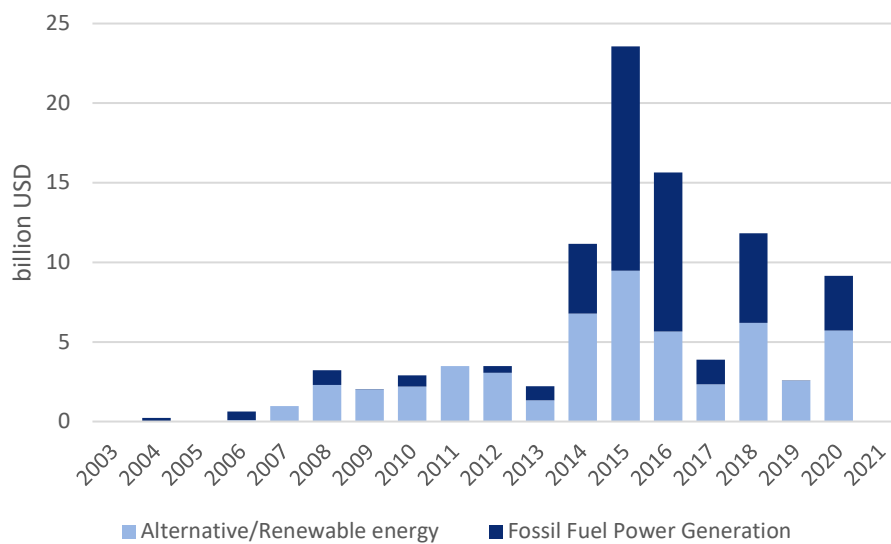


Figure 5: Overseas Future Coal Capacity Associated with Different Types of Chinese Capital Participation



Source: Boston University Global Development Policy Center China’s Global Power Database, Global Energy Monitor

Figure 6: Chinese Greenfield FDI in Fossil Fuels vs. Alternative/Renewable Energy in the Electricity Sector



Source: Ma and Springer 2022.