



CHINA'S INVOLVEMENT IN COAL-FIRED POWER PROJECTS ALONG THE BELT AND ROAD

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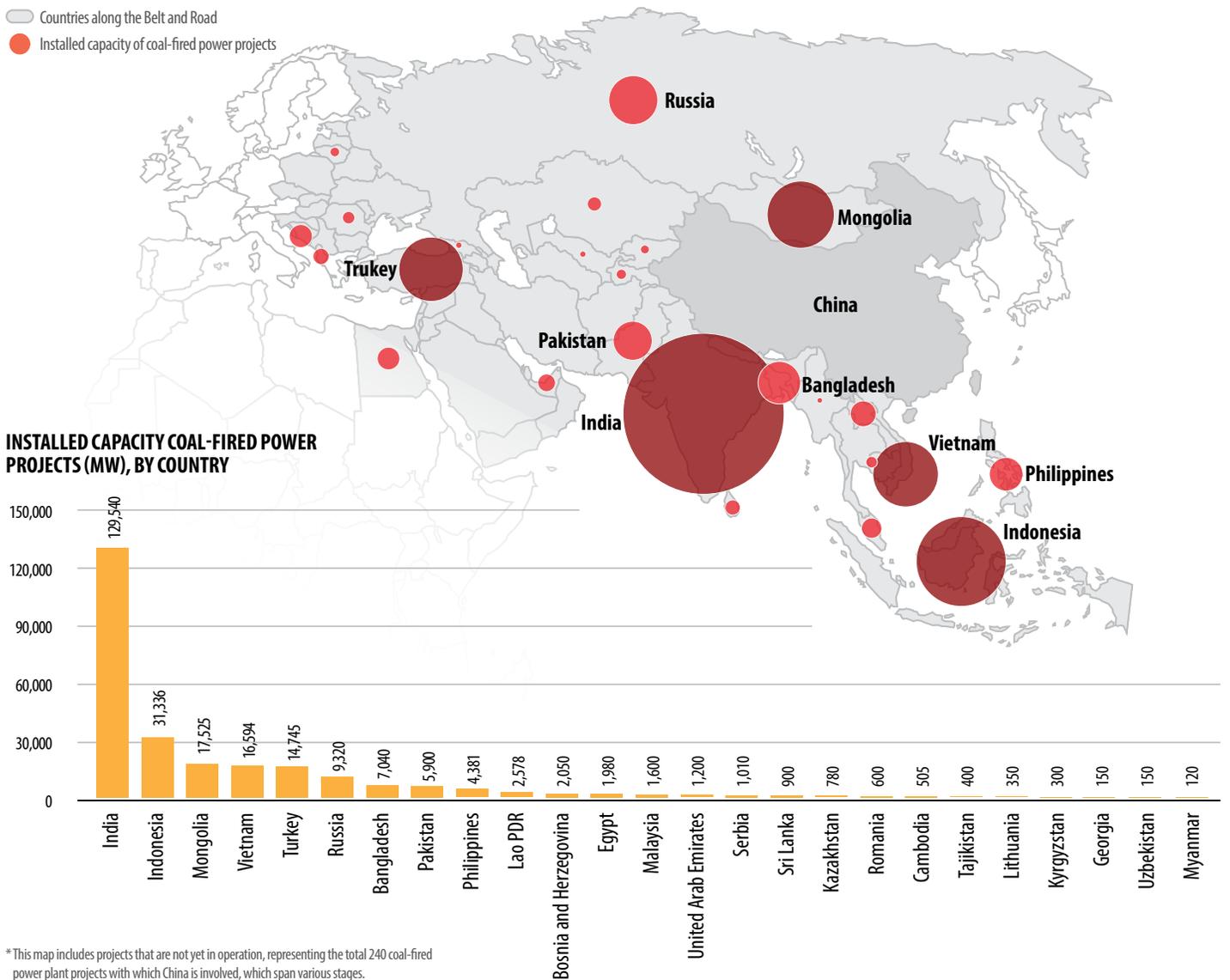
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The Paris Agreement demonstrates the global consensus on taking joint action to reduce greenhouse gas (GHG) emissions and enhance resilience to climate change. Decarbonization is becoming a major global economic development trend. As such, China's involvement in coal-fired power projects in countries along the Belt and Road has attracted the world's attention. This paper provides a baseline study on the current status of China's participation in overseas coal-fired power projects. Based on our systematic review of these projects, we offer the following preliminary conclusions and main findings.

According to our research, by the end of 2016, China had been involved in 240 coal-fired power projects in 25 of the

65 countries along the Belt and Road, ¹ with a total installed capacity of 251,054 MW. ² At present, 52 of these projects are in the pipeline (planned or signed projects), with a combined installed capacity of 72,116 MW, accounting for 12.66% of coal-fired power projects in the pipeline globally; 54 projects are under construction, with a combined installed capacity of 48,005 MW, accounting for 17.59% of coal-fired power plants under construction globally; 114 projects are in operation, with a combined installed capacity of 88,018 MW, accounting for 4.48% of the coal-fired plants in operation globally. ³ Therefore, China has become one of the important players in the development of global coal-fired power projects.

Map 1 | **Belt and Road Coal-Fired Power Projects with Chinese Involvement, by Number and Installed Capacity**⁴



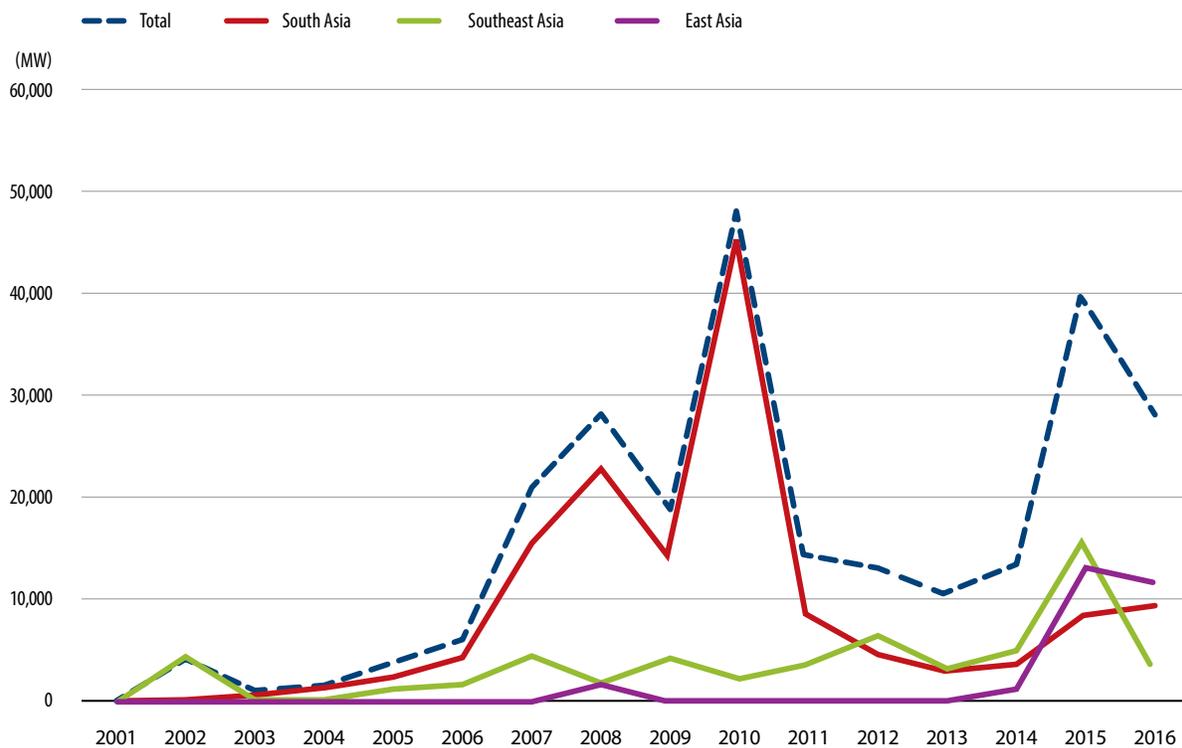
PRELIMINARY CONCLUSIONS

- Since 2001, Chinese development of coal-fired power projects in countries along the Belt and Road has fluctuated, slowing sharply in 2008, 2011 and 2016, and having peaked in 2010. Chinese involvement in Belt and Road coal-fired power projects peaked in 2010. This trend shows that China's participation in these projects is affected by global economic shifts, the policies of host countries, and restructuring toward cleaner energy.
- Overseas project contracting is the most common form of involvement for Chinese companies developing coal-fired power projects in countries along the Belt and Road. Under this approach, the governments or enterprises of host countries issue invitations to bid, whereby Chinese companies have beat other global competitors and secured bids. However, these Chinese companies do not participate in project operation and management, and therefore have no stake in the project's profits and have limited influence. Relations between China and host countries and policies of the Chinese government are not the primary drivers for these projects; rather, market factors including host countries' need to develop the power sector and the pursuit of profits by Chinese companies motivate China's participation in these projects.
- Western countries were developing coal-fired power projects in Belt and Road countries before China. Since the planning and construction period of coal-fired power projects is long, over two fifths of China's Belt and Road coal-fired power projects are in the pipeline (planned or signed) or under construction. Meanwhile, the share of projects supported by investment from China is also rising. Given the mounting opposition of the international community to new fossil fuel infrastructure and the trend towards accelerated energy restructuring, the risks associated with these projects may also increase.

MAIN FINDINGS

- China's coal-fired power projects are mostly concentrated in South Asia and Southeast Asia. East Asia, West Asia, North Africa and Central and Eastern Europe are becoming new destinations.
- China's participation has fluctuated, slowing down again in 2016.
- Overseas project contracting is the most common form of China's participation, but in recent years, the share of projects involving Chinese investment has been rising.
- Over two fifths of projects are in the pipeline (planned or signed) or under construction.
- China's five major state-owned enterprises are the main players, involved in over two thirds projects.

Graph 1 | **Capacity additions in Belt and Road Coal-Fired Power Projects with Chinese Involvement, by Year and Region**



* This chart represents the generation capacity of new projects in a given year. A project is considered a new one if it's signed or its construction begins in that year.

I. Geographical Distribution

South Asia and Southeast Asia are the main project locations, accounting for 57.11% and 22.75% of the total Chinese coal-fired power projects participation along the Belt and Road respectively. Chinese companies also have had the longest presence in coal-fired power projects in these two regions. India in South Asia and Indonesia in Southeast Asia rank No.1 and No.2 respectively in terms of installed capacity. China's heavy presence in the region is enabled by the regions' relative political stability, absence of conflict, rapid economic growth, and similar level of development and geographical proximity to China.

Since 2010, China's participation in South Asia has been shrinking while its presence in Southeast Asia has continued to expand. These trends are related to policy changes in India and economic development in Southeast Asia.

India is the top destination for China's coal-fired power projects in South Asia, accounting for 90.35% of the total installed capacity of Chinese projects in this region. India's policy changes have directly led to the decrease of China's participation in Indian projects. In September 2003, the Indian government issued a new electric power legislation to encourage the participation of private companies in the power sector and support ultra mega power projects. This policy shift drove up Chinese exports of electromechanical equipment to India. As such, equipment exports constituted the bulk of China's participation in Indian coal-fired power projects. However, in 2009, India began to adopt a protectionist policy and explicitly banned foreign participation in 11 major boiler/turbine power generator projects. In July 2012, the Indian government instated a 21% import duty on power equipment and cancelled duty exemption for ultra mega power generation projects of over 1,000 MW, which resulted in the sharp decrease of China's participation.

At the same time, in 2010, Southeast Asian countries began to recover from the 2008 international financial crisis, experiencing faster economic growth, rising exports, and

a huge inflow of foreign direct investment (FDI). Indonesia in particular was less impacted by the crisis. To tackle the international financial crisis, Southeast Asian countries implemented policies to expand domestic demand and stimulate their economies. Infrastructure development was deemed a priority sector for investment. This led China's business presence in the region to continue increasing.

In addition, as Chinese companies have faced increasingly intense competition from traditional markets of South Asia and Southeast Asia and have sought to "go global" in new regions, East Asia, West Asia, North Africa, Central and Eastern Europe, and Central Asia have also become important business destinations for Chinese coal-fired power companies.

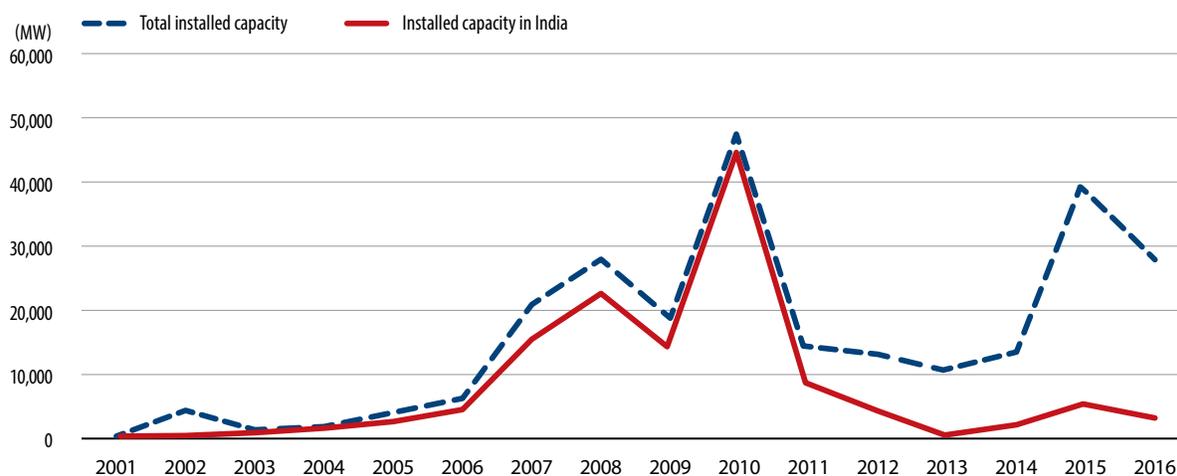
II. General Development Trends

According to the speed of project uptake in different periods, China has gone through four stages in terms of its participation in coal-fired power projects in countries along the Belt and Road:

Stage One (2001 to 2010): Rapid development. Since China proposed the "go global" strategy in 2000, China's outbound investment has expanded rapidly. Accordingly, the development and implementation of China-involved overseas coal power projects accelerated during this period alongside more diverse forms of participation. China's coal projects were mainly located in Southeast Asia and South Asia during this phase.

Stage Two (2010 to 2013): Slow growth. During this stage, Chinese overseas coal power development slowed largely due to domestic policy changes in India as explained above.⁵

Stage Three (2013 to 2015): Rapid growth. In 2013, mainstream international financial institutions changed their attitude toward financing coal-fired power plants. This includes: in July 2013, the World Bank announced that it would no longer provide loans to coal-fired power plants unless special conditions were present. The European Investment Bank (EIB)

Graph 2 | **Scale of Coal-Fired Power Projects with Chinese Involvement in India and in Total**

followed suit, announcing it would stop providing financing for coal-fired power projects in order to help member countries cut carbon emissions and meet emission reduction targets. As the largest shareholder of the World Bank, the US also made a similar decision. In October 2013, the US announced that it would stop investing in most overseas coal projects and implement measures to curb climate change caused by carbon emissions. However, concededly at the same time, China proposed the Belt and Road initiative in November 2013, to support infrastructure development in countries along the Belt and Road, thereby advancing mutually beneficial economic development. Some countries began to seek support from Chinese financial institutions and contractors for coal-fired power projects. As a result, China's participation in overseas coal-fired power projects experienced another period of relatively rapid growth.

Stage Four: Research shows that since 2016, China's support for overseas coal-fired power plant development has slowed down again. Further research is required to understand the detailed development trends and outlook. However, this shift can be seen as in line with the consensus of the 2015 Paris Agreement. Some countries along the Belt and Road

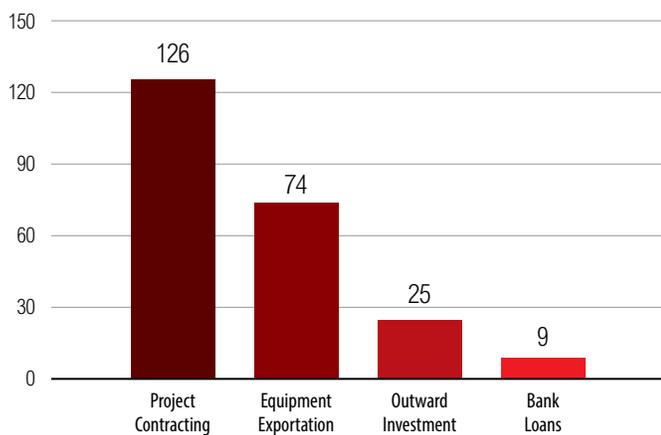
contributed to this change by reducing support for high-emission projects like coal-fired power plants and shifting toward renewable energy. For example, the Indian government began to consider suspending the development of new coal-fired power projects until the end of 2027 and committed to cutting carbon intensity 20% by 2020 and by 33% to 35% by 2030 from the 2005 level, according to India's Intended Nationally Determined Contribution (INDC).⁶ Indonesia also began to focus on renewable energy development. The Indonesian government has increased the number of new geothermal and hydro power projects and promoted reliance on new small-scale power projects to solve the problem of low power coverage.⁷ The Mongolian government also turned its attention to renewable energy and drafted a renewable energy development plan under the country's INDC.⁸ The plan supports renewable energy power projects and aims to increase the share of renewable energy in power generation to 30% by 2030.⁹

III. Major Forms of Participation

China participates in the projects mainly in the following forms: overseas project contracting, equipment exportation, outward investment, and bank loans.

Overseas project contracting refers to the following business activities undertaken by contractors through bidding and negotiated bidding: surveying; consulting; designing; construction; equipment and material acquisition; installment and testing, and project management; transfer of technology; labor; supervision; auditing; and transportation insurance.¹⁰

Graph 3 | Types and Quantity of Belt and Road Coal-Fired Power Projects with Chinese Involvement, 2001-2016



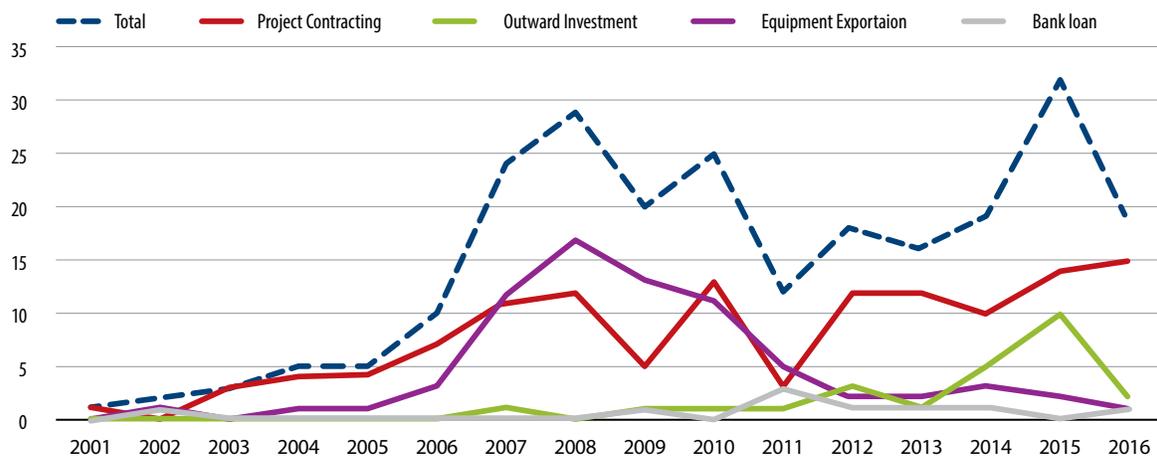
Contracting is the major form of Chinese participation in Belt and Road coal-fired power projects. 52.50% of projects are contracting projects.

Equipment exportation is the second most common form of Chinese participation, accounting for 30.83% of the total projects. Most Chinese coal-fired power projects in India are of this nature. Therefore, Chinese equipment exports echo the fluctuation of China's participation in India, which surged around 2008 and slowed down after 2011.

Outward investment is the third major form of China's participation in coal projects, accounting for 10.42% of the total projects. Outward investment refers to companies' economic activities beyond their main business, investing through capital, material assets, or stocks and bonds. This form of participation began in 2009, expanded in 2014 and peaked in 2015 (9 projects), dropping back to a low level in 2016 (1 project).

Bank loans refers to the form whereby Chinese banks provide project financing to governments or companies of host countries without the participation of Chinese companies. Fewer projects belong to this category (only 9 projects), accounting for 3.75% of total projects.

Graph 4 | Types of Belt and Road Coal-Fired Power Projects with Chinese Involvement



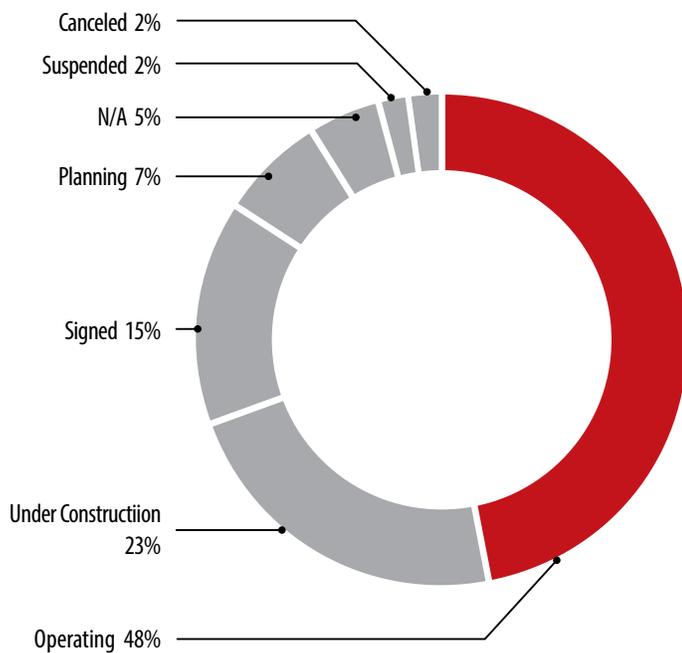
IV. Status of Coal-Fired Power Projects

Among the Belt and Road coal-fired power projects with Chinese involvement, over one fifth are in operation and over one fifth are in the pipeline (planned or signed projects).

Projects in the pipeline are mainly located in East Asia, Southeast Asia, South Asia, West Asia and North Africa. Projects under construction are mainly in Southeast Asia and South Asia, concentrated in India, Indonesia, Vietnam and Pakistan.

Cancelled and suspended projects are mainly located in India.

Graph 5 | **Current Stage of Belt and Road Coal-Fired Power Projects with Chinese Involvement**

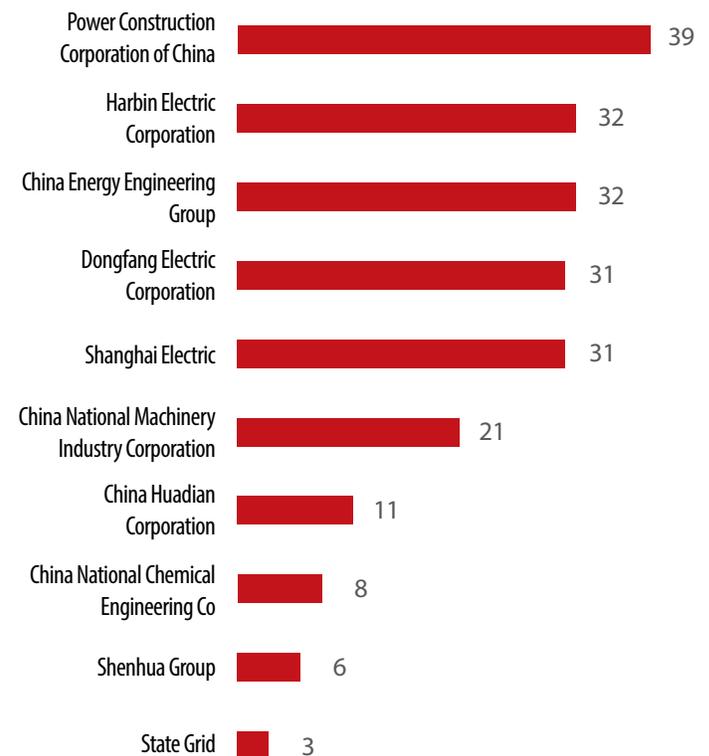


V. Major Chinese Companies Involved in the Projects

The top ten Chinese companies involved in coal-fired power projects are: Power Construction Corporation of China, Harbin Electric Corporation, China Energy Engineering Group, Dongfang Electric Corporation, Shanghai Electric, China National Machinery Industry Corporation, China Huadian Corporation, China National Chemical Engineering Co, Shenhua Group, and State Grid.

The top 5 companies participated in 165 projects, accounting for 68.75% of total projects.

Graph 6 | **Top 10 Chinese Companies Involved in Belt and Road Coal-Fired Power**



NOTES

1. The "Belt and Road" countries have expanded to 68 total countries according to the Belt and Road Portal—Overview of Countries https://www.yidaiyilu.gov.cn/info/iList.jsp?cat_id=10037. However, this study only covers 65 countries. It does not include the three newest members: New Zealand, South Africa, and Ethiopia, which joined the Belt and Road Initiative very recently.
2. Data sources: The study data spans from 2001 to the end of 2016, referring to and comparing the statistics of SourceWatch, Bankwatch and Global Coal Plant Tracker. By searching information related to coal-fired power projects in countries along the Belt and Road on Baidu and Google, and obtaining and checking data from news releases and annual reports of relevant enterprises, this study provides fairly comprehensive data and information. However, due to the long duration of some projects and limited public materials, it is difficult to examine all the relevant information related to coal-fired power projects. Therefore, we hope to improve our data in follow-up studies.
3. The reference data is from "Boom & Bust 2017: Tracking the Global Coal Plant Pipeline", 21 March 2017, <http://apo.org.au/files/Resource/boombust2017-english-final.pdf>
4. This map includes projects that are not yet in operation, representing the total 240 Belt and Road coal-fired power plant projects with which China is involved, which span various stages.
5. In 2009, the Indian government explicitly banned foreign participation in 11 ongoing major boiler/turbine power generator projects.
6. India's Draft National Electricity Plan (Dec 2016) http://www.cea.nic.in/reports/committee/nep/nep_dec.pdf
7. Ministry of Energy and Mineral Resources, Republic of Indonesia, Directorate General of Electricity, Power Policy and National Development Plan in Indonesia http://www.eri.chula.ac.th/eri-main/wp-content/uploads/2015/11/S1-2_Mr._Jarman_MEMR_final_rev.pdf
8. Mongolia's INDC http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Mongolia/1/150924_INDCs%20of%20Mongolia.pdf
9. Green Development Policy of Mongolia <http://covermongolia.blogspot.com/2014/06/green-development-policy-of-mongolia.html>
10. Overseas project contracting includes Engineering Procurement, and Construction (EPC) contracting and sub-contracting. 117 are EPC projects and 9 are subcontracted projects. Some EPC projects are supported by Chinese bank loans, but because the borrowers are governments or enterprises of host countries, Chinese companies do not participate in project management and operation and have nothing to do with the profits.

ABOUT GLOBAL ENVIRONMENTAL INSTITUTE (GEI)

The Global Environmental Institute (GEI) is a leading Chinese non-governmental organization (NGO) established in Beijing in 2004. GEI's mission is to design and implement market-based models to solve environmental problems and realize sustainable development in China and overseas. GEI provides policy suggestions to governments and promotes best environmental practices on investment, trade, energy and climate change, biodiversity protection and capacity building. Since its establishment, GEI has been engaging in research and demonstration projects in more than 20 provinces, cities, and municipalities in China as well as in Southeast Asian and African countries.

Through its Investment, Trade, and Environment program, GEI is dedicated to encouraging and supporting the Chinese government to formulate foreign investment and trade-related environmental policies that regulate and guide the environmental conduct of enterprises investing overseas; build up the environmental governance capacity of host countries, including the development of appropriate environmental policies that regulate environmental conduct of investors; and improve the capability of Chinese enterprises to comply with environmental policies and regulations, better manage investment risks and fulfill their environmental and social responsibilities.