China Is Investing Heavily in European Wind

Asian Superpower's Renewable Energy Ambitions Go Beyond Its Belt and Road Footprint

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Executive Summary

China's investment in foreign wind-powered electricity markets has surpassed US$12 billion in Europe and Australia alone as private and stated-owned Chinese companies move aggressively to capitalize on fast-growing renewable energy markets.

Most of this activity has been in Europe.

Some notes on this trend:

- China's foreign renewable energy investments have increased as a result of the country's pan-Asian Belt and Road Initiative (BRI), but the majority of these investments are not in BRI countries.
- China's largest power companies have historically favoured coal and hydro over wind and solar, a bias that continues to be evident in recent foreign investments, particularly in Southeast Asia and Africa.
- In recent years, as China's global technology leadership in low-emission energy sectors has developed, some Chinese power companies have shifted their outbound investments toward wind. This is the case particularly in OECD member countries, most of which are not part of the official BRI footprint.
- Chinese state-owned independent power producers have acquired big wind projects in nine European countries, aiming especially to diversify their foreign portfolios and gain expertise in offshore wind technology.
- In BRI countries and in non-BRI developing countries, China continues to build coal-fired power projects as opportunities for domestic coal projects dry up.

Renewable Energy Investments Increase; Most Are in Non-BRI Countries

China has invested enormously in renewable energy in recent years, and Chinese state-owned power companies are actively looking now for opportunities to expand their foreign clean energy investments.[1]

The roll-out of China's Belt and Road Initiative (BRI) in 2013 enshrined a national program to invest internationally within a strategic framework. BRI seeks to organize a broad range of foreign Chinese infrastructure investments along a series of land and sea corridors that go through more than 60 countries.

Chinese companies have invested in foreign clean energy projects before, but BRI has helped expand and organize opportunities and seen existing investments rebranded to fit within the wider BRI strategy.

Prior to the BRI, China had a "Going Out" strategy that sought to encourage state-owned companies to seek foreign opportunities and in which hydro power dominated Chinese foreign energy investments at 48% of the total (Figure 1) from 2003 to 2017.

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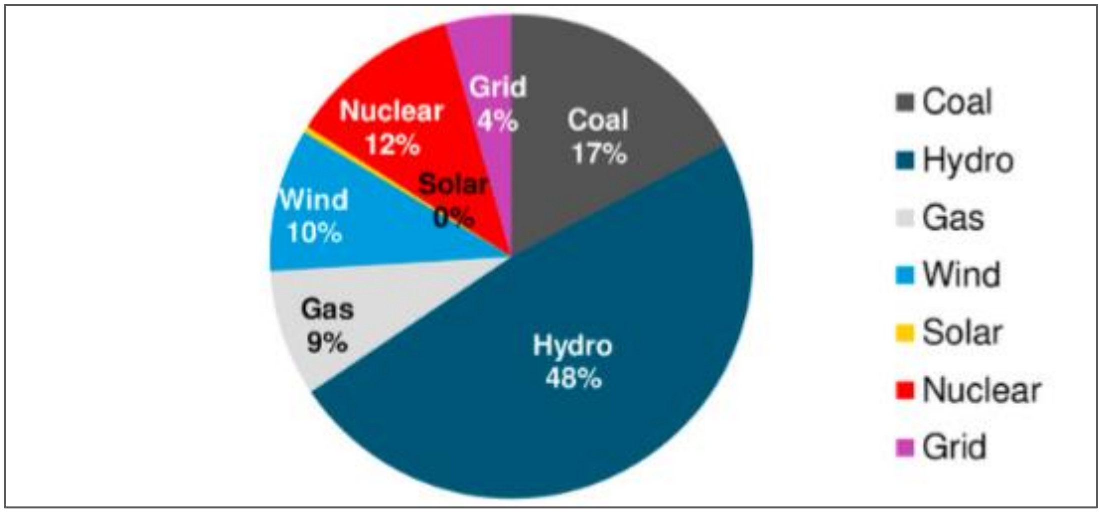
[1] Bloomberg, "China Seen Set to Dominate Clean Energy on Investment Surge", 10th January 2018.

China's foreign investment in renewable energy has skyrocketed with the BRI. Chinese companies invested a total of US$7.7 billion in 2016, more than double investment in 2014 (US$2.67 billion), according to American Enterprise Institute and Heritage Foundation data.[2]

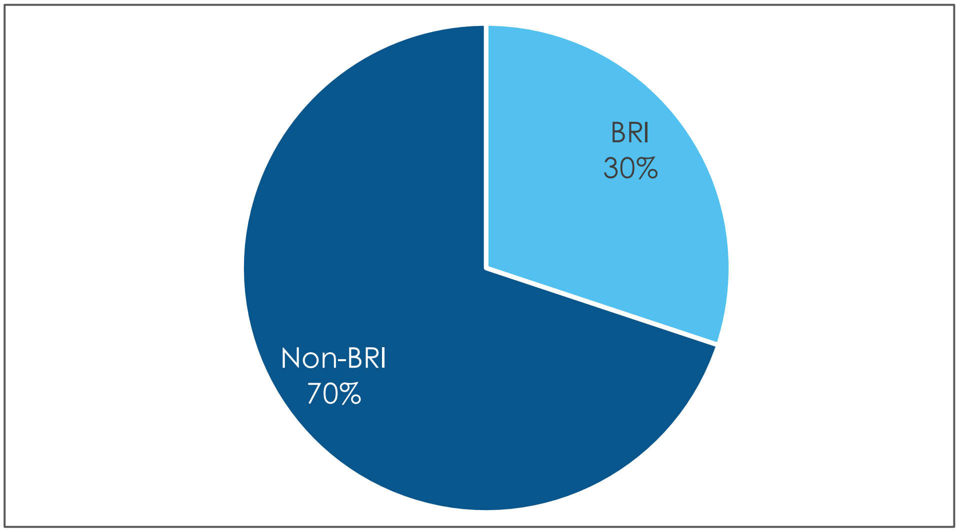
Figure 1: Chinese State-Owned Power Companies Foreign Investment by Technology 2003-2017



Source: Bloomberg New Energy Finance, CEC, Heritage Foundation.

Even so, from 2010 to 2017, only 30% of Chinese foreign investment in renewables was in BRI countries. Top recipient BRI countries included Pakistan (US$1.9 billion), Malaysia (US$0.7 billion), Turkey (US$0.6 billion), India (US$0.4 billion), and Vietnam (US$0.4 billion). Some non-BRI countries actually saw higher levels of investment, including Germany (US$3.6 billion), Australia (US$2.5 billion), the U.K. (US$2 billion), and Greece (US$1.6 billion).

Figure 2: Chinese Foreign Investment in Renewable Energy (2010-2017)



Source: American Enterprise Institute/Heritage Foundation (2018).

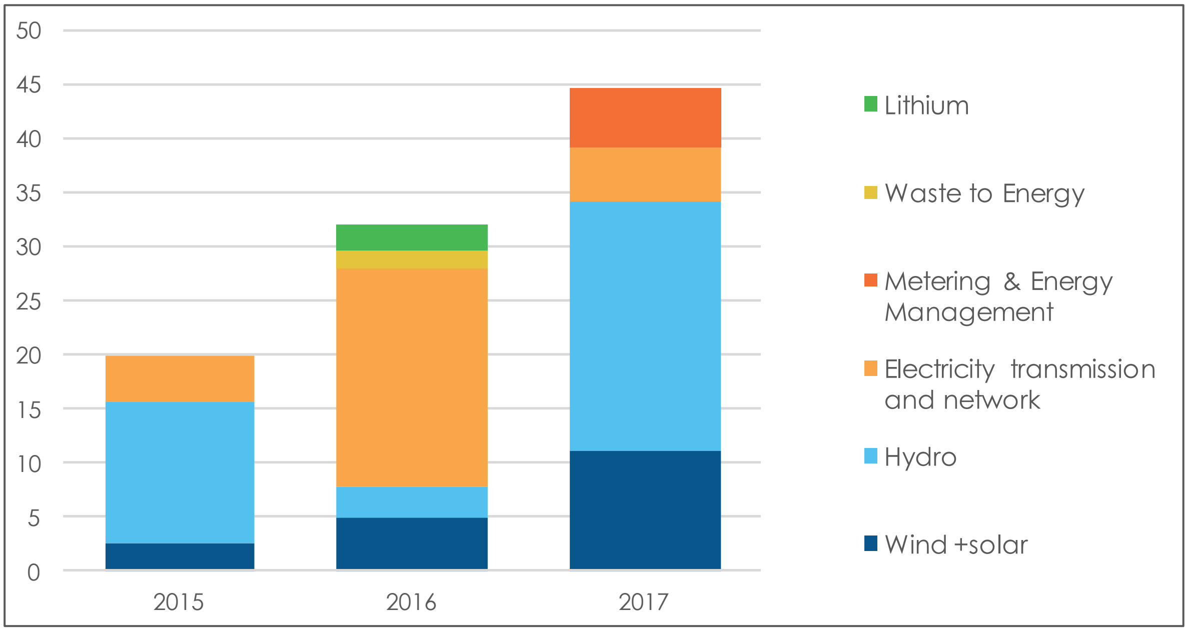
[2] AEI, "China Global Investment Tracker".

If figures for transmission, new energy resources and energy management are included, China's investment in clean energy in other countries becomes even more impressive.

In 2016, IEEFA calculated that China had made US$32 billion of large clean energy project investments (greater than US$1 billion) in foreign countries. The figure for 2017 was higher still, reaching US$44 billion.[3] Between 2015 and 2017, a total of US$34 billion was invested in in BRI countries, whereas US$61 billion went to non-BRI countries.

Latin America is an interesting case in point. This region—clearly outside of the natural BRI corridors—has attracted so much electricity-sector investment from Chinese companies in recent years, particularly in hydro, transmission and solar projects, that the initiative's reach is being re-defined to include Latin America.[4] So while China's strategy of maneuvering to dominate foreign clean energy markets transcends formal BRI boundaries, we are now starting to see those boundaries expanding to cover more geographical areas of Chinese interest.

Figure 3: Chinese Foreign Investments (>US$1 billion) in Clean Energy 2015 to 2017 (US$bn)



Source: IEEFA estimates.

These investments are a mix of private and state-supported partnerships, with private Chinese companies less likely than state-owned enterprises to receive funding from state-owned banks.

Bloomberg New Energy Finance (BNEF) has found that the BRI program provides little support for wind and solar power, with the majority of BRI electricity-generation investment going to conventional power and fossil fuels.[5] This trend has taken root as opportunities to build more

[3] IEEFA, "China 2017 Review", 9th January 2018.
[4] ChinaDialogue, "China's Belt and Road lands in Latin America", 11th July 2018.
[5] BNEF. 2018. Chinese Power Companies' Global Investment Strategies: Seeking Returns and Managing Risks. January 23. Accessed via Bloomberg network.

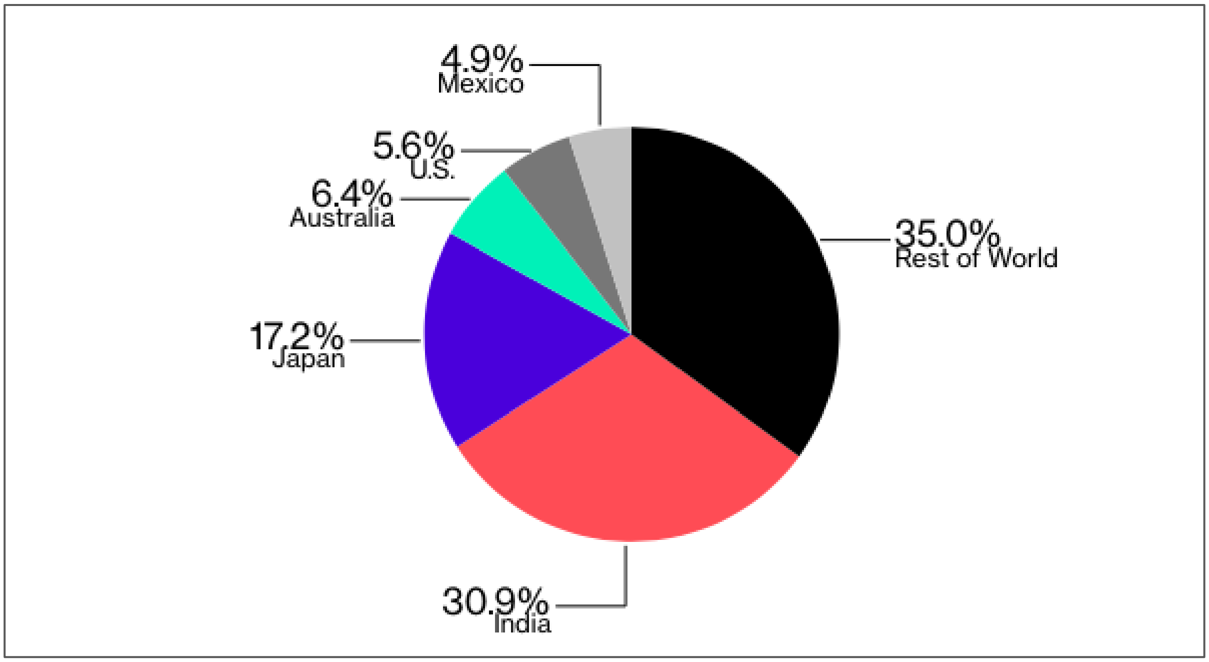
coal-fired and hydro power plants in China have declined significantly and as companies as a result have sought foreign opportunities for coal and hydro projects.

Credit risk that stems from the fact that many BRI nations are relatively under-developed is a key reason for limited wind and solar investment support. Varying regulations and standards, trade tariffs, and the lack of infrastructure to connect electricity generated from renewables to grids are also key barriers to BRI investment in renewables. Here global power transmission investment by State Grid Corporation of China can play a major role in further wind and solar development —much of which is likely to be backed by Chinese funding.

BRI solar and wind developers are often private companies with limited access to public financing. However, these companies have been able to enter BRI markets to a certain extent: from 2015 to 2016, they exported $7.6 billion of solar equipment to BRI countries without formal support from the BRI program, according to BNEF.[6]

The grip that private Chinese companies have on global solar module manufacturing goes well beyond the BRI and looks set to increase now that China has scaled back its domestic solar build-out ambition. These companies are likely to seek even more opportunities abroad and add to existing plans for new manufacturing plants around the globe.

Figure 4: Non-Belt and Road Nations Account for the Majority of Chinese Solar Module Exports



Source: China Chamber of Commerce for Import and Export of Machinery and Electronic Products, Bloomberg.

China's state-owned companies are also increasingly active in foreign wind and solar investments, although again this activity is occurring often beyond BRI territory.

[6] BNEF. 2017. Energy key to China's $1 trillion Belt & Road strategy. May 18. Accessed via Bloomberg network.

China Longyuan, the world's largest wind power developer, is a subsidiary of China Energy Investment Corporation—itself the world's largest overall power producer. Until recently, Longyuan focused on the domestic market but is now expanding in other markets by way of the BRI. It is looking past BRI boundaries, too, eyeing projects in Canada, Poland, and the U.S. Longyuan has also recently brought into operation its first project in South Africa.[7]

Chinese Companies Target OECD Countries for Wind Investment

Chinese power companies' foreign wind investment increased significantly from 2015 to 2016, from US$148 million to US$6 billion in 2016, according to BNEF.[8] Chinese state-owned power companies are especially attracted to wind projects in OECD countries because of lower operating risks and supportive wind policies in those countries. The European Union (US$6.8bn) and Australia (US$5.1bn) were the main recipients of Chinese wind investment from 2011 to 2017.

Up to H1 2017, the top three international wind-acquisition companies were China Three Gorges (CTG), with a total of US$3.3 billion invested, Shenhua (now part of China Energy Investment Corp), with US$3.3 billion, and State Power Investment Corporation (SPIC), with US$2.7 billion. In 2018, state-owned PowerChina made its first move into the Australian wind power market, buying 80% of a Tasmanian wind project from Chinese privately-owned company Goldwind, which will retain the remaining 20%.[9]

Goldwind, the third-largest wind turbine manufacturer globally, has expanded its wind acquisitions in the Americas and Australia in recent years. Faced with saturated domestic markets, Goldwind's strategy has been to go global in a series of foreign acquisitions. In 2017, Goldwind acquired Origin Energy's 530 MW wind farm project in Australia for US$81.5 million and secured US$130 million-$140 million of financing for installing wind turbines at the 160 MW Rattlesnake Wind Project in Texas, which Goldwind acquired in 2016. In 2018, Goldwind opened an office office in Denmark, a seat of wind power expertise, as it seeks to expand its presence in Europe.

State-owned and private Chinese companies alike are acquiring wind projects in OECD countries, as they seek to acquire offshore wind technology knowledge, create new markets for their wind turbine products, and benefit from favourable wind policy incentives like tax breaks or feed-in-tariffs in host countries.

[7] South China Morning Post, "Wind farms operator China Longyuan steps up overseas expansion, follows Belt and Road", 13th March 2018.
[8] BNEF. 2018. Chinese power companies' global investment strategies: seeking returns and managing risks. January 23. Accessed via Bloomberg network.
[9] The Asset, "PowerChina makes first move into Australian wind power", 18th April 2018.

Figure 5: Key Chinese Foreign Wind Acquisitions 2016-2017

Date Announced	Acquirer	Deal (US$ million)	Target	Recipient Country
Dec-17	China Resources	803	30% in the Dudgeon offshore wind farm	UK
Nov-17	China Energy Investment Corp	3,490	75% in 4 wind parks in Greece	Greece
Oct-17	China Investment Corp	390	10% in Equis Energy	Singapore
Jun-17	China Three Gorges	283	49% in EDP Portugal Wind Farms	Portugal
May-17	Xinjang Goldwind	82	100% in Origin Energy's Stockyard Hill Wind Farm	Australia
Dec-16	China General Nuclear	430	100% in Gaelectric's 14 wind farms	Ireland
Oct-16	China Three Gorges	340	49% in EDP Poland Wind Farms	Poland
Oct-16	China Three Gorges	100	49% in EDP Italy Wind Farms	Italy
Jun-16	China Three Gorges	1,800	80% in Blackstone's Meerwind wind farm	Germany
May-16	State Power Investment Corp	230	100% in Taralga Wind Farm	Australia
Feb-16	State Development and Investment Corp	260	100% in Beatrice and Inch Cape Offshore Wind Farms	UK
Jan-16	China General Nuclear	Undisclosed	100% in Brenig onshore wind farm	UK
Jan-16	State Power Investment Corp	2,125	Pacific Hydro's wind and hydro assets	Australia
Total		**10,333**		

Sources: IEEFA, BNEF, Heritage Foundation, and media reports.

Chinese Companies Are Acquiring Big Wind Projects in Europe

European wind projects have become key targets for acquisition-minded Chinese energy companies faced with saturated domestic markets and government mandates to invest in other countries. In the past 10 years— after letting European interests bear the early development costs of learning by doing— Chinese buyers have diversified their portfolios and gained expertise in offshore wind technology by acquiring wind farms across nine countries in Europe. China is now racing to catch up with European countries in the offshore power sector and is expected by BNEF to overtake U.K. offshore capacity by 2022.[10]

Major wind acquisitions by Chinese state-owned energy companies in Europe over just the past two years, beginning with the most recent one:

- The July 2018 acquisition by **China General Nuclear's** (CGN) of 75% of a 650 MW onshore wind project in Sweden from Macquarie and GE Energy Financial Services.[11] The deal's value was not disclosed. A key BRI player, CGN is seeking to invest further afield, including in the in the U.K., where it hopes to augment its traditional nuclear power investments (which include the controversial Hinkley Point C project) with renewable energy holdings. Much of CGN's investment in the U.K. will be in wind power as it seeks to become a major electricity generator there.

- The December 2017 announcement by **China Resources Power** (CR Power), one of the top 10 state-owned power companies in China, of its acquisition of 30% of the Dudgeon offshore wind farm for US$803 million from Statkraft UK Ltd. CR Power sees this deal as a gateway to the European offshore wind market. Currently, 84% of the company's domestic production is from coal, 14% in wind and 1.1% in hydro; this was its first foreign power investment.[12]

[10] BNEF, "Global Offshore Wind Market Set to Grow Sixfold by 2030", 8th January 2018.
[11] Reuters, "China's CGN acquires 75 percent of Swedish wind farm: Xinhua", 18th July 2018.
[12] BNEF. 2018. Chinese power companies' global investment strategies: seeking returns and managing risks. January 23. Accessed via Bloomberg network.

- The November 2017 acquisition by **China Shenhua Group** (now part of **China Energy Investment Corp.**) of a 75% stake in four Greek wind farms developed by Copelouzos Group. This US$3.49 billion deal was the first Chinese investment in wind power in Greece and includes an agreement with Copelouzos to develop solar projects in Greece. Before merging with China Guodian to create China Energy Investment Corp. in 2017, coal accounted for 91% of Shenhua Group's domestic power assets. From 2003 to 2017, the company's foreign investment in coal projects totaled US$4.6 billion, and its wind investments totaled US$3.3bn.[13] After the merger, China Energy Investment Corp became the world's largest wind power developer, with 33 GW of capacity.
- The July 2016 acquisition by **China Three Gorges (CTG),** the world's biggest hydropower developer, of an 80% stake in the Blackstone Group's Meerwind offshore wind farm in Germany for US$1.8 billion. CTG with this deal is seeking to gain project management and technology expertise in one of the world's leading offshore wind markets. CTG has sought wind holdings in Europe since its 2011 acquisition of 23% of Energias de Portugal (EDP), Portugal's state-owned energy company. In 2016 and 2017, CTG expanded its wind portfolio with a 49% stake in EDP's wind projects in Portugal, Poland and Italy. In May 2018, the company made a US$10.9 billion offer[14] for 100% control of EDP. The offer was declined, but CTG has entered discussions with other European utilities as it seeks ways to progress the EDP deal. From 2003 to 2017, the company invested a total of US$3.3bn in foreign wind power assets.[15]
- The February 2016 acquisition by the **State Development and Investment Corp (SDIC),** a Chinese state-owned power company, of Repsol's share in the Beatrice and Inch Cape Offshore Wind Farms on the east coast of Scotland for US$260m. This was the first investment by SDIC in European offshore wind, and the deal was for 100% of the 784 MW Inch Cape project and 25% of the 664 MW Beatrice project. The U.K. is Europe's largest offshore wind market, and this investment reflects a wider trend toward Chinese investment in the U.K. energy sector. From 2003 to 2017, SDIC invested in three projects in the U.K. or Southeast Asia and plans to increase its foreign wind assets.[16]

Chinese Companies Continue to Favor Coal Over Wind and Solar in BRI Countries

Although Chinese companies are rapidly placing themselves in a strong position to dominate the global clean energy sector, it is also clear that many Chinese companies are still building and financing foreign coal-fired power projects as opportunities for domestic coal-fired projects dry up.

In 2017, the Chinese government began restructuring its power-generation sector in an effort

[13] BNEF. 2018. Chinese power companies' global investment strategies: seeking returns and managing risks. January 23. Accessed via Bloomberg network.
[14] BNEF. 2018. What's next for China Three Gorges' $11B bid for EDP? May 15. Accessed via Bloomberg Network.
[15] BNEF. 2018. Chinese power companies' global investment strategies: seeking returns and managing risks. January 23. Accessed via Bloomberg network.
[16] BNEF. 2018. Chinese power companies' global investment strategies: seeking returns and managing risks. January 23. Accessed via Bloomberg network.

to reduce reliance on coal and export China's renewable energy technology while continuing to promote its coal technology in foreign markets.

Chinese foreign energy investment from 2003 to 2017 was dominated by hydro and coal-fired power, with wind and solar coming to the fore more recently by way of technology gains, efficiency improvements, and dramatic declines in cost.

Whilst Chinese wind and solar investment goes well beyond the BRI to developed nations, coal-fired power activity remains high within the BRI and in other developing countries. From 2003 to 2017, the majority of China's foreign power investments in Southeast Asia went to hydro (US$45 billion) and coal (US$12 billion) projects, amounts significantly higher than Chinese wind investment in the EU (US$6.8 billion) and Australia (US$5 billion).[17] Although this trend is influenced by the fact that wind and solar investment has ramped up only within the last few years, it is clear that Chinese coal power investment is restricted more to the BRI and to developing countries.

China Huadian Corp. was the biggest Chinese international coal investor with a total of US$11.2 billion of investment in that sector from 2003 to 2017, followed by Shenhua (US$4.6 billion) and China Huaneng Group (US$3.2 billion).[18]

Huadian plans to build a 1,320 MW coal-fired power plant in Bangladesh (a signatory to the BRI). PowerChina also has a Bangladesh coal project and is contracted to construct the controversial Lamu project in Kenya, of which Huadian is part of the proponent consortium.

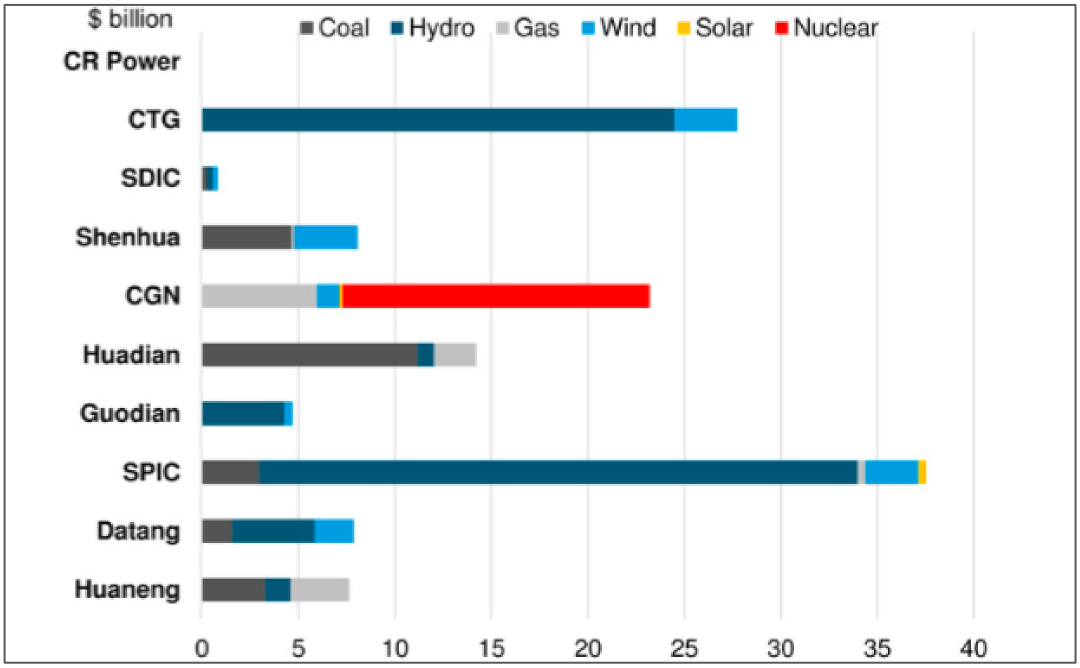
Pakistan, a key BRI country, is hosting substantial Chinese involvement in infrastructure investment, including in coal-fired power. Companies like China Huaneng Group and China Machinery Engineering Corp. (CMEC) are heavily involved in Pakistani coal projects. CMEC alsohas a coal-fired project proposal in Mozambique.

Shanghai Electric and Dongfang Electric are part of consortium that has recently been awarded a tender to build the 6,000 MW Hamrawein coal power project in Egypt, a nation on the BRI crossroads between Asia, Africa and Europe.

[17] BNEF. 2018. Chinese power companies' global investment strategies: seeking returns and managing risks. January 23. Accessed via Bloomberg network.

[18] BNEF. 2018. Chinese power companies' global investment strategies: seeking returns and managing risks. January 23. Accessed via Bloomberg network.

Figure 6: Top 10 Chinese Power Companies' Foreign Investment by Technology, 2003-1H 2017



Source: BNEF 2018.

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