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DISCUSSION PAPER

Chinese Investments in Pakistan's Energy Transition

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China's One Belt and Road Initiative (BRI)

The President of the People's Republic of China, Xi Jinping, announced the BRI in 2013 on his visit to Kazakhstan, with the vision to connect the maritime ports of Southeast Asia, South Asia, the Middle East, Europe and Africa with China, establishing an elaborate trade and transportation infrastructure. The Chinese government operationalized trade with European countries in 2015 through the two routes of the Silk Road Economic Belt, running north to the Scandinavian countries through Russia and Germany, and running south through central Eurasia to Lisbon. The ports were also connected to this belt through the committed infrastructure projects, which were mainly financed through the Asia Infrastructure Investment Bank (AIIB)[1].

Figure 1: Map showing BRI regions and projects[2].

The major regions spanning the BRI include Southeast, Central, and South Asia (shown in Figure 1) for enhanced infrastructure and regional connectivity. These zones align with six strategic international economic corridors: the China-Pakistan Economic Corridor (CPEC), Bangladesh-China-India-Myanmar (BCIM), the Eurasian Land Bridge, China-Mongolia-Russia, China-Central Asia-West Asia, and the China-Indochina Peninsula. Additionally, vital transportation routes along the BRI, which include important railways and ports, also play a critical role in linking nations along the 21st Century Maritime Silk Road, opening up trade and cooperation opportunities[3].

China's shift towards regional economic engagement led to the launch of the BRI, rooted in its broader strategy of reform and opening up since the late 1970s. Initially focused on developed economies, China expanded its outreach westward after becoming the world's second-largest economy in 2010. This new focus targeted neighboring regions in Central, South, and Southeast Asia to promote investment, export excess capacity, and advance its "good neighbor" policy alongside the Western Development Strategy[4].

1 https://www.tandfonline.com/doi/abs/10.1080/00207543.2019.1605225

2 https://www.researchgate.net/publication/327159506_China_Belt_and_Road_Initiative_How_revival_of_the_silk_road_could_impact_world_trade

3 https://ipripak.org/wp-content/uploads/2024/05/Paper-BRI-March-2024.pdf

4 https://www.cigionline.org/static/documents/documents/no.225%20web.pdf

Many policies and guidelines have been established under the BRI over the years for collaboration and cooperation among member countries and China, including the Suzhou guidelines[5], which were compiled and issued on 24th November 2015 at the fourth summit of the Central and Eastern European Countries and China. These guidelines set the tone for economic, financial, agroforestry, science and technology, health, and people-centric and cultural cooperation among the signatories. Another important document is the Vision document on the joint building of the Silk Road Economic Belt[6], which was issued by the National Development and Reform Commission (NDRC) in 2015. The document establishes frameworks for joint cooperation to facilitate global trade through the BRI in line with the principles of the UN charter, which advocates for peaceful coexistence. It outlines the priorities of participating countries and cooperation mechanisms through local, regional and international forums.

The main goals[7] of the BRI include:

Figure 2: Major goals of the Belt and Road Initiative.

Although China's official discourse portrays the BRI as a platform for mutual growth and cooperation, academic literature presents a more divided perspective. There appears to be a lack of clarity in the initiative's underlying motivations, with analysts often split between viewing the BRI as collaborative and as driven by China's strategic self-interest. Official Chinese authorities and public channels project the country's BRI as an open and collaborative opportunity for Europe and Asia; however, most critics believe that behind the cooperative façade lies a policy that is rooted in Chinese economic expansion and serves their interests[8].

The Chinese Ministry of Ecology and Environment, in collaboration with international partners, initiated the BRI International Green Development Coalition (BRIGC) in May 2017, which was announced by President Xi Jinping at the first Belt and Road Forum for International Cooperation (BRF)[9]. BRIGC was established with the primary objective of fostering global consensus, mutual understanding, and collaborative action in pursuit of green development along the BRI. It aims to embed principles of sustainable development within the BRI framework through joint initiatives, helping participating countries advance environmental and developmental goals aligned with the Sustainable Development Goals (SDGs)[10].

5 https://eng.yidaiyilu.gov.cn/p/1432.html

6 https://chinaus-icas.org/wp-content/uploads/2019/12/vision_and_actions_on_jointly_building_silk_road_economic_belt_and_21st-century_maritime_silk_road.pdf

7 https://greenfdc.org/belt-and-road-initiative-about/

8 https://www.tandfonline.com/doi/abs/10.1080/00207543.2019.1605225

9 https://wedocs.unep.org/bitstream/handle/20.500.11822/28901/Belt_and_Road.pdf?sequence=1

10 http://en.brigc.net/About_us/Overview/202009/t20200928_102502.html

The major thematic partnerships under BRIGC include:

1. Biodiversity and ecosystem management
2. Green energy and energy efficiency
3. Green finance and investments
4. Improvement of environmental quality and green cities
5. South-south environmental cooperation and SDG capacity building
6. Green technology, innovation and corporate social responsibility
7. Sustainable transportation
8. Climate change governance and green transformation
9. Environmental legislation and standards
10. Maritime community with a shared future and marine environment governance[11]

Funding and Investments under the BRI

Between 2014 and 2024, China significantly increased its investments and construction projects in ten countries: Pakistan, Indonesia, Bangladesh, Malaysia, Singapore, Laos, Israel, the UAE, Egypt, and Nigeria. Compared to the period from 2005 to 2013, the growth was substantial—especially in Pakistan, where investment levels tripled. Nine of these countries lie within China's six Belt and Road economic corridors, reinforcing the strategic focus of the BRI. Malaysia, Singapore, UAE and Laos also saw a doubling of Chinese investment flows into construction and other initiatives. Pakistan and Indonesia emerged as the top recipients of Chinese funding and projects as of 2024, as shown in Table 1. President Xi mentioned many priority projects in his speech at the BRF, including the Karakoram Highway through CPEC, the Jakarta Bandung High Speed Rail, China-Laos Railway and China-Thailand Railway down the China-Indochina Peninsula economic corridor, the Gwadar Port, Port of Piraeus and Hambantota Port, and the Trans Eurasia Railway[12].

11 *https://green-bri.org/belt-and-road-initiative-green-coalition-brigc/*
12 *https://www.cigionline.org/static/documents/documents/no.225%20web.pdf*

Table 1: China's Investment and Construction Contracts before (2005–2013) and after (2014–2024) the BRI — Top 15 Countries (US$ billion)13.

S. No	Country	2005-2013 Value (US$ billion)	2014-2024 Value (US$ billion)	Percentage Change
1	**Bangladesh**	3.77	29.78	689.92%
2	**Israel**	1.82	11.21	515.934%
3	**UAE**	7.73	38.26	394.955%
4	**Singapore**	11.51	50.43	338%
5	**Pakistan**	12.91	51.13	296%
6	**Indonesia**	16.6	57.5	246%
7	**Laos**	8.18	24.32	197.311%
8	**Malaysia**	15.77	39.1	148%
9	**Egypt**	8.27	19.16	131.681%
10	**Saudi Arabia**	21.56	47.18	119%
11	**Brazil**	30.83	48.9	58.612%
12	**Iraq**	14.71	22.19	50.85%
13	**Russia**	22.93	32.08	40%
14	**Vietnam**	16.49	21.71	32%
15	**Nigeria**	19.21	23.2	20.77%
16	**India**	16.17	18.84	17%
17	**Angola**	14.92	15.77	6%
18	**Kazakhstan**	22.19	22.79	2.7%
19	**Turkey**	10.85	9.66	-10.968%
20	**Iran**	12.97	10.34	-20.278%
21	**Ethiopia**	16.57	12.36	-25.407%

The BRI is largely financed by state-owned policy and commercial banks, which together contributed around 87% of total funding by the end of 2018; 81% directly through loans and an additional 6% via government-backed bilateral funds and BRI bonds. The remaining 13% came from enterprise equity financing in China's capital markets, multilateral institutions, and the Silk Road Fund. Two key players, the China Development Bank and the Export-Import Bank of China, jointly accounted for nearly half of the BRI's capital, with $196 billion and $145 billion in loans, respectively. Four major commercial banks, including the ICBC, Bank of China, China Construction Bank, and Agricultural Bank of China, collectively added $227.2 billion in financing (breakdown given in Figure 3), supporting hundreds of international projects and enabling overseas bond issuance and insurance for Chinese enterprises involved in BRI countries[14].

13 https://www.aei.org/china-global-investment-tracker/

14 https://www.researchgate.net/publication/340840127_The_Belt_and_Road_Initiative_Motivations_financing_expansion_and_

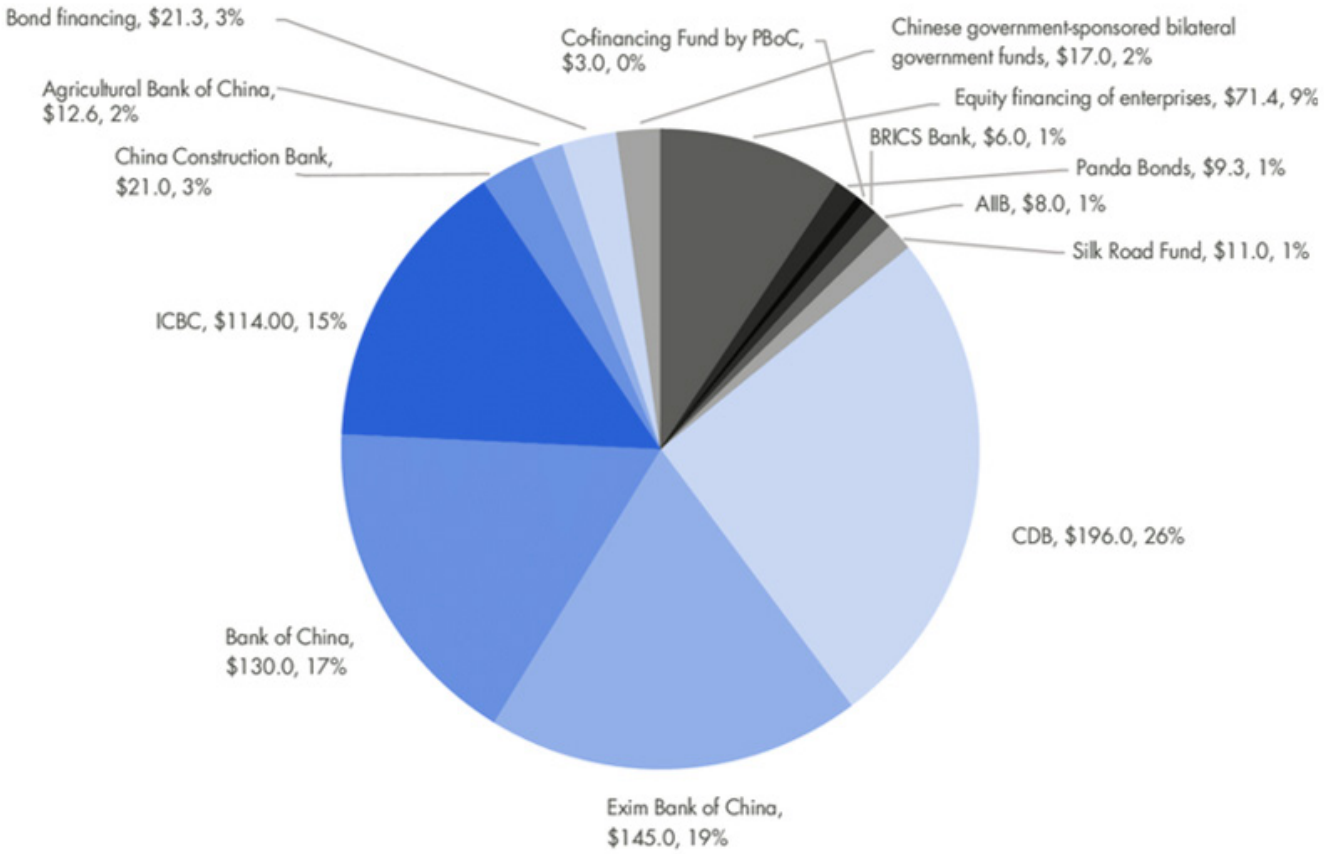

Figure 3: BRI funding by source at the end of 2018 (US$ billion)[15]

The BRI remains heavily focused on the energy sector, though the trend has been declining. In 2021, the BRI investments totalled approximately 22.3 billion US dollars—down from 26.1 billion US dollars in 2020 and 44.8 billion US dollars in 2019. That year (2021), oil, solar/wind, and gas each accounted for roughly a third of energy engagement. While China pledged to halt overseas coal power development, three new coal projects were announced in early 2021 in Bosnia, Indonesia, and Vietnam, though their financing remains uncertain due to increasing withdrawal of financial support from investors such as ICBC. Oil investments rose to 6.4 billion US dollars in 2021, with key recipients including Iraq and Tanzania, while gas projects reached 4.5 billion US dollars, focused on construction for field expansions in countries like Uzbekistan and Thailand. Engagement in green energy and hydropower declined to 10 billion US dollars in 2021 from 16.4 billion US dollars in 2019, continuing a downward trend from previous years, although construction activity remained relatively stable[16]. These investments can be visualized in Figure 4.

challenges_of_Xi's_ever-expanding_strategy

15 *https://www.researchgate.net/publication/340840127_The_Belt_and_Road_Initiative_Motivations_financing_expansion_and_challenges_of_Xi's_ever-expanding_strategy*

16 *https://media.bhrrc.org/media/documents/Nedopil-2022_BRI-Investment-Report-2021.pdf*

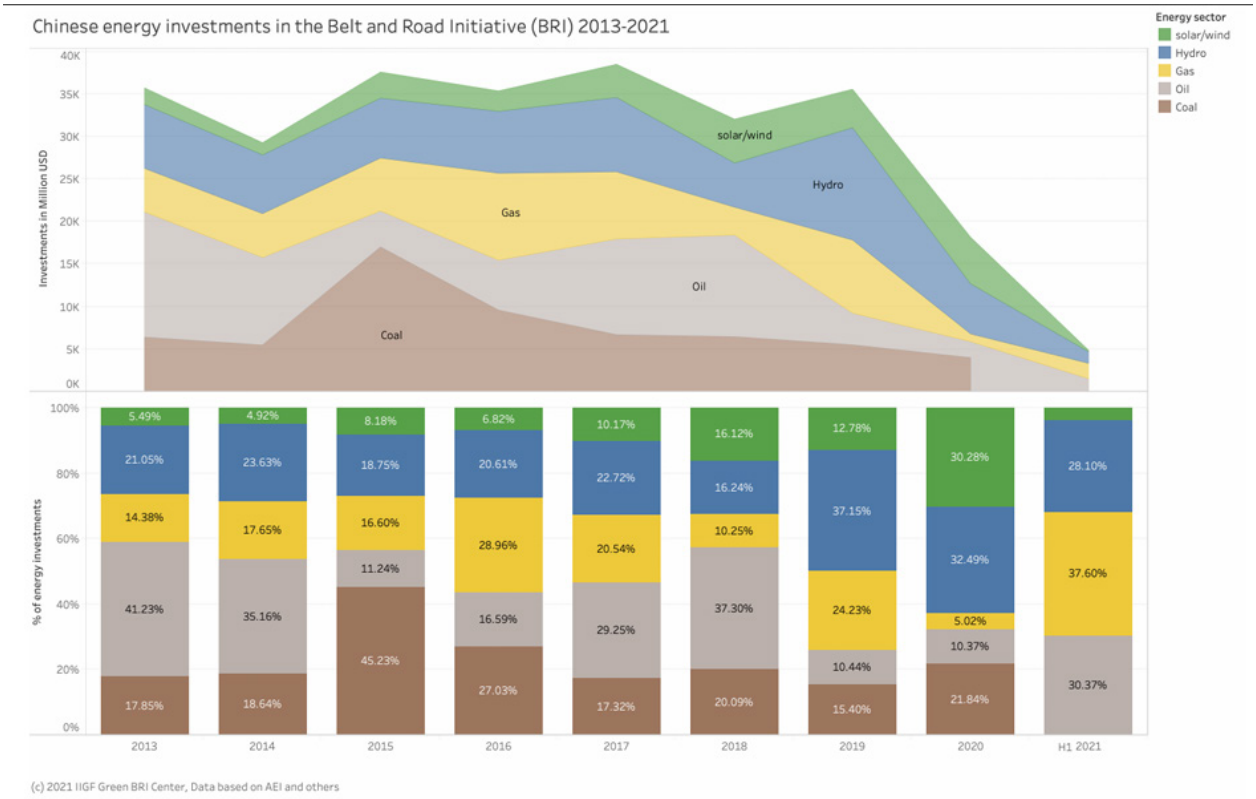

Figure 4: China's global investments in the energy sector under BRI (2013-2021)[17]

Chinese Investments in Pakistan under the BRI

Pakistan received a major bulk of Chinese investments 2013 onwards, when CPEC was inaugurated, which included infrastructural projects such as roads, airports, hospitals, and power plants, highlighted in Figure 5. Energy sector investments topped the charts, especially in fossil-fuel-fired plants, mainly coal, and hydroelectric power as well. More than fifty percent of investments were channeled into the country's energy sector, mainly in hydropower[18]. China's strategic move of investing in Pakistan has facilitated its access to the Indian Ocean and important trade routes. Statistics from 2023 show that China has invested more than 70 billion US dollars under the CPEC project, including the development of the Gwadar port, hydroelectric and other power projects[19]. A complete list of energy sector projects falling under CPEC is given in Table 2.

17 https://iigf-china.com/wp-content/uploads/2022/04/10.-BRI-Investment-Report-H1-2021.pdf

18 https://greenfdc.org/wp-content/uploads/2021/01/China-BRI-Investment-Report-2020.pdf

19 https://storymaps.arcgis.com/stories/6ca00fcdda684593bd15514afdd25327

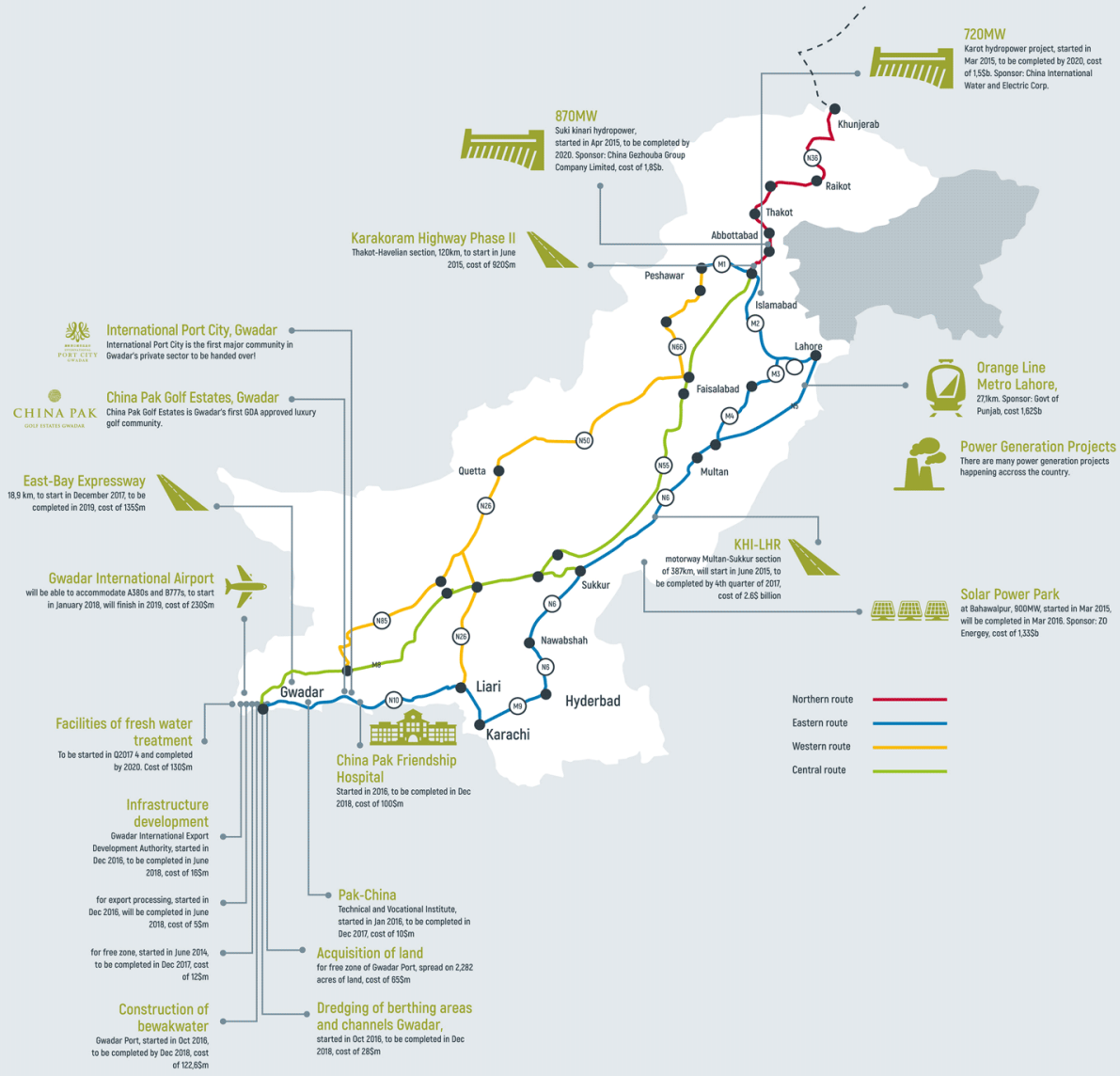

Figure 5: CPEC route and projects in Pakistan under the BRI[20]

20 https://www.cpicglobal.com/cpec-map/

Table 2: Energy projects in Pakistan under CPEC[21]

Power Project	Installed Capacity
Sahiwal Coal-fired Power Plant	1320MW
Coal-fired Power Plant at Port Qasim Karachi	1320MW
China Hub Coal Power Project, Hub Balochistan	1320MW
Engro Thar Coal Power Project	660MW
Quaid-e-Azam Solar Park (Bahawalpur)	1000MW
Hydro China Dawood Wind Farm, Gharo, Thatta	50 MW
UEP Wind Farm, Jhimpir, Thatta	100MW
Sachal Wind Farm, Jhimpir, Thatta	50MW
Three Gorges Second and Third Wind Power Project	100MW
Matiari to Lahore ±660 KV HVDC Transmission Line Project	±660 KV
Karot Hydropower Project, AJK/Punjab	720MW
HUBCO Thar Coal Power Project (Thar Energy)	330MW
SSRL Thar Coal Block-I 7.8 mtpa & Power Plant (Shanghai Electric)	2×660MW
HUBCO ThalNova Thar Coal Power Project	330MW
Suki Kinari Hydropower Project, KP	884MW

21 https://cpec.gov.pk/energy

Challenges associated with BRI projects

There are many challenges to the implementation of the projects under the BRI, which have been visualized through Figure 6 below. But these challenges and barriers could become opportunities if utilized correctly, and regulatory and mitigatory measures are implemented.

Figure 6: Barriers to and facilitators of transport connectivity and trade related to BRI[22].

Financial and economic challenges within the BRI

Since 2017, critics have increasingly accused China's BRI of creating a debt trap for the investment recipient countries. This accusation has gained traction, especially in Western media, and political and academic discourse in the recipient countries. However, claims that China intentionally burdens partner countries with unsustainable debt lack conclusive evidence. The more pressing concerns stem from the opaque nature of state-led investments, particularly in areas like project bidding, financing arrangements, and mechanisms for resolving disputes[23]. Many countries involved in the BRI face significant economic and political challenges, with over 90 percent of them classified by the World Bank as low or lower-middle income. Several countries, including Sri Lanka and Zambia, have struggled to repay Chinese loans and turned to the IMF for assistance, while other countries like Myanmar have shown reluctance toward Chinese investment, leading to the government halting major projects such as the Myitsone dam that were committed under the BRI through Chinese financing.

Environmental issues associated with BRI

A wide range of environmental challenges stem from the expansive infrastructure development under the BRI, which heavily relies on cement and contributes to pollution and carbon emissions. The initiative is a threat to the sustainable management of transboundary water resources in Central Asia and raises concerns about the outsourcing of polluting industries to partner countries, leading to environmental degradation. Chinese CO2 emissions associated with its exports have also been greatly misreported, reaching 3000 Mt, which has complicated the creation of effective carbon trade policies. Additionally, while the BRI enables access to vast reserves of minerals, oil, and electricity, it introduces sustainability concerns regarding resource extraction, development, and distribution. Energy cooperation across regions, though promising, also brings up complex issues related to energy security and long-term ecological impact[24].

22 https://www.researchgate.net/publication/327159506_China_Belt_and_Road_Initiative_How_revival_of_the_silk_road_could_impact_world_trade

23 https://www.cigionline.org/static/documents/documents/no.225%20web.pdf

24 https://www.tandfonline.com/doi/abs/10.1080/00207543.2019.1605225

Mass deforestation to acquire land for setting up mega infrastructure projects such as railways, roads, and pipelines is also a major constraint. Destruction of natural habitats and the disruption of natural ecosystems as a result of changes in land use, discharging industrial waste into natural waterways, respiratory and other health issues caused by increased PM 2.5 and other harmful gases and substances in the atmosphere are all major side effects of development projects under the BRI[25].

Sociopolitical issues associated with the BRI

Political instability and weak institutions in countries like Pakistan and Myanmar further complicate BRI implementation. China's foreign policy, while rooted in economic growth and regional stability, is marked by assertive territorial stances, particularly in the South China Sea and along its border with India, where it has responded forcefully to perceived threats. The BRI serves as a strategic tool for China to expand its global influence and reshape regional dynamics, especially in South Asia. Through infrastructure investments and port developments in countries like Pakistan, Sri Lanka, Myanmar, and Bangladesh, China has gained significant geopolitical leverage, often at the expense of India's regional dominance. In response, India has strengthened military ties with Indian Ocean nations and opposed key BRI projects, notably the CPEC, which it views as a threat to its strategic interests. This rivalry has fueled confrontational politics and negative propaganda, with India portraying BRI as a vehicle for Chinese economic coercion[26].

Chinese investments in Pakistan – Implications and challenges

Many infrastructural projects have been completed in Pakistan under the CPEC, as evident from Figure 5. However, this lucrative foreign investment comes with its threats and challenges, for Pakistan as well as the investors and the Chinese personnel. These challenges range from sociopolitical to environmental as well as financial. There is also ambiguity around local and national laws and policies in Pakistan that apply to these projects, which further complicates the matter. CPEC triggered profound sociocultural changes in Pakistan, especially in its most vulnerable regions, including rapid urbanization, shifting community structures, and demographic transitions. While it offered the people improved access to services, employment, and skill development, especially near major infrastructure sites, it created massive concerns and issues around cultural displacement, social inclusion, and the erosion of indigenous traditions, which has become very evident in the villages of Tharparkar, where coal-fired power plants under CPEC are operational. Women's evolving roles and labor rights have been undermined due to increasing development, leading them to travel long distances just to fetch water from distant wells[27].

In addition, development has also shifted the job market and livelihood structure of the local communities. Following the launch of CPEC, projections suggested significant job creation in Pakistan—400,000 by the ILO and up to 800,000 by the Planning Commission by 2030. However, early CPEC projects revealed a gap between available jobs and local skill levels, leading to a preference for foreign labor over the local unskilled workforce by the Chinese firms. A major example is how out of 1100 skilled workers hired for the Gwadar Free Zone in 2017, only 250 were of Pakistani origin[28]. The local land has also been contaminated by coal mining waste, leading to reduced fertility of the soil. Since the majority of Tharparkar's communities relied on agropastoralism, their sources of income

25 https://thecrsss.com/index.php/Journal/article/view/35/34

26 https://ipripak.org/wp-content/uploads/2024/05/Paper-BRI-March-2024.pdf

27 https://ojs.mrj.com.pk/index.php/MRJ/article/view/448/530

28 https://www.e-ir.info/2022/03/10/cpec-an-assessment-of-its-socio-economic-impact-on-pakistan/

and livelihoods have been severely impacted because of the erection of coal-fired power plants[29].

Environmental impacts of CPEC projects include deforestation, pollution, water table depletion, reduced soil fertility and biodiversity losses. Heavy machinery, industrial activity, and land-use changes threaten air and water quality, while increased CO_2 emissions contribute to climate change and glacier melting at the country and regional level. Fly ash from the transportation of coal mined in one part of the country to another also depletes the air quality by increasing concentrations of particulate matter and other polluting substances in the atmosphere[30]. The local vegetation, natural grazing lands and pastures, and the local biodiversity have also been impacted as a direct result of these mega infrastructure projects, especially the hydropower and energy projects.

From the investor's and an external viewpoint, the Chinese personnel working on CPEC-related projects in Pakistan also face many security threats, especially from militants in tribal areas and the law and order situation in big cities near their projects. Political instability and infighting among political parties contribute negatively to the effectiveness of the CPEC projects. Provincial conflicts also hamper the progress of new development projects and investment inflows[31], especially between Balochistan and Punjab or the Federal government.

Although Chinese authorities recognize the social, environmental, cultural, and even economic constraints associated with the development of mega infrastructure projects and are shifting the focus towards green financing and emission reduction, the extension of these considerations from Chinese investors towards large-scale cross-border projects, especially large energy infrastructure setups, remains ambiguous and lacking. In Pakistan, although the regulations exist that the approval of mega infrastructure projects is reliant on the acceptance of PC-I and PC-II forms, which mandate EIAs, that in turn have a whole section dedicated to community and local grievances and their resolution mechanisms, they are not followed through during implementation. Major EIAs require the implementation of a thorough Grievance Redressal Mechanism (GRM) focused on the communities where the project is being implemented; however, lack of enforcement by the government and regulators has led to the suffering of the local communities and villages where these development projects have been established.

BRI and a just energy transition

Mr. António Guterres, the UN Secretary-General, highlighted the importance of common but differentiated responsibilities under international environmental law at the third Belt and Road Forum in 2023. He emphasized that the developed countries need to scale ambition and reach net zero by 2040, with the developing economies striving for a 2050 target. A just energy transition requires significant financing and development mechanisms and needs to follow a fair and equitable process[32]. Energy transition is not a sudden replacement of fossil fuels with renewables, but rather a gradual shift that reduces reliance on traditional sources while expanding the role of cleaner alternatives like solar and wind, which had negligible shares in the global energy mix previously. The BRI covers six major global routes, and so, an investment shift towards a clean energy transition within the initiative would impact global dynamics. Major challenges like market liberalization, heightened competition, shrinking domestic employment prospects, and increased economic instability across interlinked economies have shown up over the last few decades, leading the world to look into just energy transitions[33].

29 https://www.priedpk.org/wp-content/uploads/2023/01/Coal-Power-and-Livelihood-Disruptions-in-Thar.pdf

30 https://iopscience.iop.org/article/10.1088/2515-7620/ad8a22/meta

31 https://issi.org.pk/wp-content/uploads/2019/07/5-SS_Muhammad_Zahid_Ullah_Khan_and_Minhas_Majeed_Khan_No-2_2019.pdf

32 https://press.un.org/en/2023/sgsm21993.doc.htm

33 https://www.frontiersin.org/journals/sustainable-food-systems/articles/10.3389/fsufs.2022.982086/full

At the UN General Assembly in 2021, President Xi Jinping pledged to place moratoriums on coal-powered plants and their financing abroad, in the pursuit of carbon neutrality by 2060. As a result, Chinese investors and banks cancelled committed coal projects with the capacity of 42.8 gigawatts, leading to 4.5 billion tonnes of carbon emissions abatement[34]. The annual Greenpeace East Asia report released for 2024 highlighted that Chinese renewable capacity surged to 11.8 terawatts, leaving coal behind, which is a testament to China's decarbonization commitments[35]. The number of coal power plant permits issued also dramatically declined by 80 percent in 2024[36], and looking at the 14th five-year plan period for China, the total approved capacity since dropped to 62.24 gigawatts, showing a marked decline from 2023 onwards (shown in Figure 7).

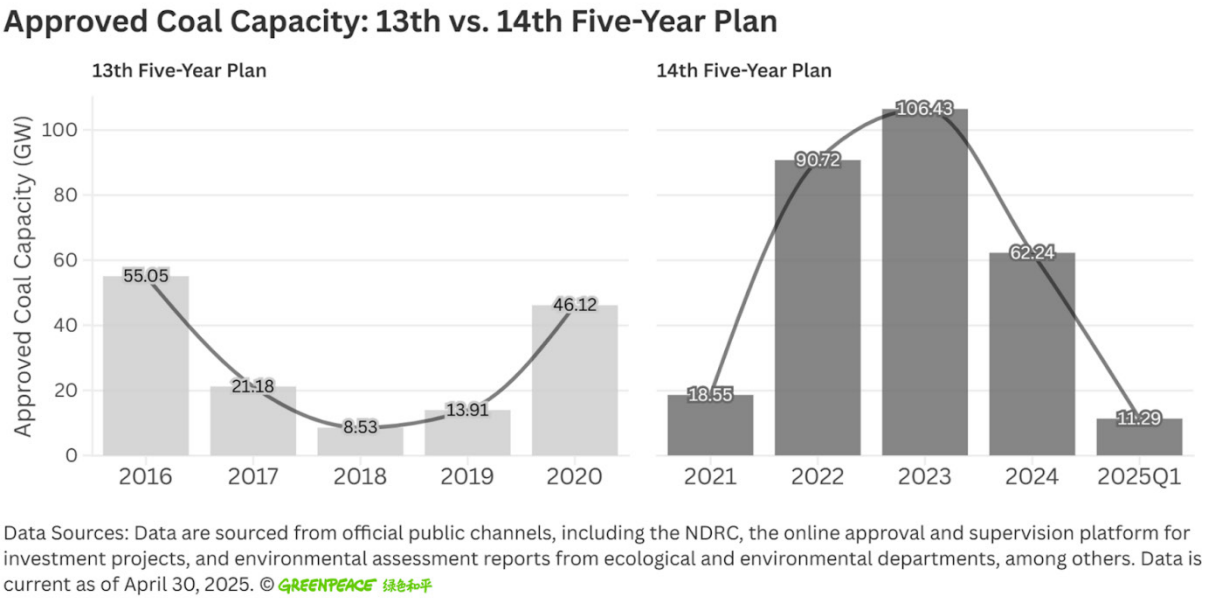

Figure 7: Trend showing approved coal capacity for China's 13th and 14th five-year plan, running from 2015 to 2025[37].

To present itself as a global leader in renewable energy production and transition, China has aligned its BRI with its green development goals. This shift is guided by a series of environmental and investment policies aimed at promoting low-carbon growth and enhancing Environmental, Social and Governance (ESG) standards across international projects. The growing momentum for sustainable energy financing worldwide, including initiatives like Just Energy Transition Partnerships and green bonds, creates a favorable climate for Sino-Pakistani collaboration. Pakistan stands to benefit significantly from Chinese expertise in renewable technologies, particularly in wind and solar, and could save billions by reducing fossil fuel imports and meet its commitment of 30 percent renewables by 2030, as outlined in its Alternative Renewable Energy Policy of 2019. Public-private partnerships need to be prioritized, and a robust policy framework needs to be established to incentivize Chinese investment in Pakistan, mediating a just energy transition under the second iteration of the CPEC[38].

34 https://dialogue.earth/en/digest/chinas-overseas-coal-power-projects-persist/

35 https://change.greenpeace.org.hk/publications/annual-reports/gpea-2024-annual-report_hk_eng.pdf

36 https://www.reuters.com/business/energy/china-has-cut-new-coal-power-plant-permits-by-nearly-80-greenpeace-says-2024-08-21/

37 https://www.greenpeace.org/eastasia/press/68068/china-approved-11-29-gw-of-coal-power-in-q1-2025-after-pipeline-shrank-in-2024-for-first-time-since-2021-greenpeace-report/

38 https://drive.google.com/file/d/1LkJk-LDdSBbYTINylXlJVDA1WPKxaTB8/view

Facilitating a just energy transition in Pakistan

Pakistan's energy sector's future needs to be sustainable and equitable to ensure the rights of all its residents in the long run. The BRI can play a vital and significant role in pushing Pakistan towards a just energy transition by channeling finance, as well as facilitating the mutual sharing of resources. It emphasizes inclusive policy frameworks, community engagement, and green investment priorities that balance economic growth with environmental stewardship. By integrating social justice into energy planning, Pakistan can harness BRI partnerships to accelerate its shift toward clean energy, empowering local communities, protecting ecosystems, and fostering long-term resilience. A few major steps Pakistan and China can take to facilitate this transition include:

1. Prioritize the integration of renewable energy projects into Pakistan's energy mix to mediate a shift from expensive and dirty fossil fuels to solar and wind, as well as cleaner and more efficient technologies.

2. Expedite approvals and create a conducive local market and policy landscape for the implementation of renewable energy projects in naturally resource-rich regions, allowing for a faster and more streamlined energy transition.

3. Channel private overseas investments into Pakistan's energy transition through the creation of Special Economic Zones (SEZs) along the CPEC corridor, as well as through localized manufacturing hubs.

4. Arrange technical training programs at the regional and national level to empower workers laid off from fossil fuel-based jobs, as well as locals and communities directly linked to energy projects.

5. Facilitate the creation of green jobs as a result of the clean energy transition and develop socio-economic opportunities for the communities directly residing along the CPEC routes.

6. Facilitate access to concessional loans, green bonds, and other national and international financing mechanisms and tools to promote the shift, alleviating concerns for financial constraints.

7. Evaluate and report environmental and social constraints and impacts associated with existing energy infrastructure projects through focused studies, and for upcoming projects through EIAs, leading to the identification of the least intrusive projects.

8. Set up a transparent monitoring, reporting and accountability mechanism for all international investments, especially under CPEC, to ensure compliance and minimize harm to the environment, the community, and the climate.

9. Ensure reporting and complaint registration and resolution mechanisms are built into every new energy project, and integrated into existing ones, to build community-investor trust and prevent the infringement on the rights of locals in terms of land, air, water, and other resource use.

Recommendations and interventions for Pakistan's energy sector developments

The Thar coalfields, a centerpiece of Pakistan's energy strategy under CPEC, have attracted significant Chinese investment to develop coal-fired power plants. While these projects have boosted energy capacity, they raise concerns around environmental degradation, water scarcity, health and air quality, and long-term sustainability. Moreover, a dedicated mechanism to report the grievances and follow up for their alleviation is severely lacking for the communities residing in the vicinity of these mega power projects. The following recommendations aim to balance energy needs with climate commitments, local development, community empowerment and strategic diplomacy.

To the Chinese companies running power plants in Thar

- Invest in cleaner and more innovative technologies, focusing on repurposing fossil fuel-based plants into renewable energy projects to reduce emissions and socio-environmental and cultural disintegration.
- Launch biodiversity offset programs and soil restoration initiatives to mitigate ecological damage caused by mining and plant operations.
- Implement closed-loop water systems and invest in desalination or wastewater recycling to reduce pressure on local water sources and mitigate further depletion of the water table.
- Establish regular dialogue forums with local communities and villages; make the environmental impact assessment reports public and disclose CSR spending.

To the Sindh Government

- Empower and strengthen the Sindh Environmental Protection Agency (SEPA) with technical capacity and legal authority to monitor emissions and enforce compliance.
- Develop a district-level water strategy for Tharparkar that prioritizes sustainable usage and equitable access for the local communities and the villages.
- Fund independent studies on respiratory and water-borne diseases, other health risks and diseases, adverse effects of mining and dumping of waste, as well as correlation of mining and power generation activities with changing climate and weather patterns, and publish the findings annually.
- Create and provide access to proper reporting channels, legal and otherwise, to ensure that private sector development does not just benefit the investor while bringing harm to the indigenous communities.
- Create vocational training centers to train local youth and village residents in green skills to prepare them for the energy transition and green jobs.
- Review and revise the land use and land rights policy of Sindh, and ensure its implementation to avoid stripping people of their right to ancestral lands.

To the Federal Government

- Develop a roadmap to reduce coal dependency by 2035, prioritizing the early retirement and phaseout of coal-based power plants, including the ones funded through Chinese investments, and align them with Pakistan's climate commitments under its NDCs and the Paris Agreement.
- Introduce a carbon tax or cap-and-trade system to internalize the social and environmental costs of coal power production.
- Commission an independent audit of all CPEC energy projects to assess environmental, social, and economic impacts, and make the results public to ensure transparency and reliability.
- Facilitate access to international green bonds and climate funds, in addition to allocation of the national budget for renewable energy projects to offset coal reliance.
- Initiate bilateral talks with the Chinese government and private investors to reorient future CPEC energy investments toward low-carbon technologies and joint research and development initiatives.

To Chinese Authorities Working with BRI/CPEC

- Ensure all future energy investments in Pakistan under BRI comply with China's Green BRI principles and global climate and net zero commitments.
- Facilitate the transfer of cleaner and renewable technologies to Pakistani partners, facilitating local manufacturing and indigenization of supply chains.
- Establish a China-Pakistan Environmental Oversight Board in collaboration with the Federal government to monitor emissions, water usage and quality depletion, land degradation, air quality, and environmental and community impacts of BRI projects.
- Collaborate with Pakistani authorities to develop a phased exit strategy from coal, with clear timelines and financial support for energy transition aligned with both countries' climate commitments.
- Integrate environmental standards into all energy and infrastructure projects under the BRI, new and existing, and ensure their implementation and compliance through regular monitoring and reporting.
- Create a mechanism to engage all relevant stakeholders, especially the communities and villages whose lands would be impacted as a result of development projects, to avoid infringing upon their rights.
- Develop built-in mechanisms to ensure that complaints/grievances are properly recorded, their records maintained, and their resolution swift and fair.

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