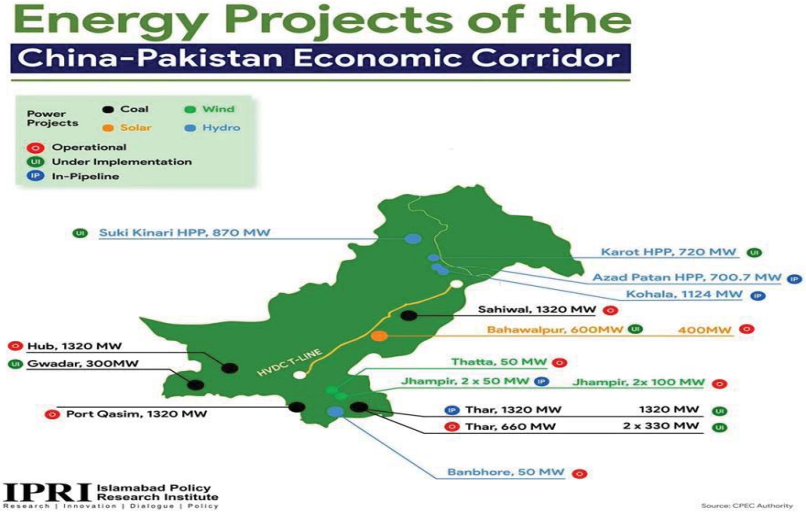


Revitalizing Pakistan's Energy Landscape through CPEC



Muhammad Tanveer Ul Qamar, ACMA
CEO, Allied Financials

The China-Pakistan Economic Corridor (CPEC), established in 2015 through a bilateral agreement between China and Pakistan under the Belt and Road Initiative (BRI), aims to connect over 60 countries across Asia, Africa, and Europe through infrastructure development, including roads, railways, energy generation, and special economic zones. CPEC's primary objective is to enhance the lives of people in both countries by transferring technology to Pakistan and fostering knowledge sharing. China initially allocated $62 billion for various projects, with approximately $34.7 billion designated for energy projects. By the last fiscal year, $13 billion had been invested, with another $4 billion expected for ongoing power projects. Of the 21 CPEC projects, 15 are completed, generating over 8,000 MW of power. The focus on energy aims to ensure reliable power supply for existing industries and new special economic zones, driving future economic growth. Additionally, China is helping establish special economic zones across Pakistan to support economic development, reduce unemployment, and boost exports.



The initial approved cost of electricity generation for CPEC energy projects was PKR 8.80 per KWH, significantly lower than Pakistan's national power generation cost of PKR 16.43 per KWH in 2015. Through investments and the installation of modern technology, China has helped reduce electricity generation costs in Pakistan by supporting various power generation setups, including:

a) Coal-fired power plants

b) Nuclear energy plants

c) Hydropower plants

d) Solar energy plants

e) Wind power plants

Energy plays a crucial role in the economic development of any country, driving industrial and commercial activities. Through the significant development of CPEC power projects, Pakistan's power sector has improved, leading to reduced outages. CPEC not only strengthens power security in Pakistan but also promotes industrial development, contributing to socio-economic progress. These projects have bridged the gap between power generation and supply, improving power transmission lines and enhancing generation capacity. As a result, Pakistan now enjoys more reliable power transmission, a stable national grid, and a substantial reduction in power outages. These advancements have fostered economic growth, boosted investor confidence, and created a healthier business environment and industrial setup.

The Sahiwal Coal-fired Power Plant, with a capacity of 1,320 MW, was completed on October 28, 2017, at a cost of $1,912.20 million, financed by an Independent Power Producer (IPP). The Port Qasim Coal-fired Power Plant in Karachi, also with a capacity of 1,320 MW, was completed on April 25, 2018, with the same investment and financing model. The China Hub Coal Power Project in Hub, Balochistan, with a capacity of 1,320 MW, was completed on August 17, 2019, at a cost of $1,912.20 million, financed by an IPP.

	Project Name	MW
	Completed Projects	
1	Sahiwal Coal fired Power Plant	1320
2	Coal fired Power Plant at Port Qasim Karachi	1320
3	China Hub Coal Power Project, Hub Balochistan	1320
4	Engro Thar Coal Power Project	660
5	Quaid-e-Azam Solar Park (Bahawalpur]	400/ 500
6	Hydro China Dawood Wind Farm, Gharo, Thatta	50
7	UEP Wind Farm, Jhimpir, Thatta	100
8	Sachal Wind Farm Jhimpir, Thatta	50
9	Three Gorges Second and Third Wind Power Project	100
10	Matiari to Lahore +660 KV HVDC Transmission Line Project	4,000 MW Evacuation Capacity
11	Karot Hydropower Project, AJK/Punjab	720
12	HUBCO Thar Coal Power Project (Thar Energy]	230
13	SSRL Thar Coal Block-1 7.8 mtpa & Power Plant [2x660MW] (Shanghai Electric]	1320
14	HUBCO ThalNova Thar Coal Power Project	230
15	Suki Kinari Hydropower Project, KP	884
	In-Pipeline Projects	
16	Coal-Fired Power Project at Gwadar	300
17	Kohala Hydropower Project, AJK	1124
18	Azad Pattan Hydropower Project, AJK/Punjab	700.7
19	Thar Mine Mouth Oracle Power Plant & surface mine	1320
20	Cacho Wind Power Project	50
21	Western Energy (Pvt.) Ltd. Wind Power Project	50

Another key project, the 720 MW Karot Hydropower Project (AJK/Punjab), was completed on June 29, 2022, at a cost of $1,720 million. The SSRL Thar Coal Block-1, with a capacity of 2x660 MW, was completed on February 5, 2023, at a cost of $1,912.12 million, financed by an IPP. The Suki Kinari Hydropower Project in KP was completed on September 13, 2024, at a cost of $2,000 million, also financed by an IPP.

The first project in the pipeline is the 300 MW Coal-Fired Power Project, with an estimated cost of $543.32 million. The Government of Pakistan (GoP) and IPP signed the Implementation Agreement (GoP-IA) and Power Purchase Agreement (PPA) on April 8, 2021, with land acquisition beginning in February 2020. The second project is the 1,124 MW Kohala Hydropower Project in AJK, with an estimated cost of $2,400 million. GoAJK signed the Implementation Agreement (GoAJK-IA) and Water Use Agreement (GoAJK-WUA) in April 2021, and land acquisition is in progress. The next project is the 700.7 MW Azad Pattan Hydropower Project (AJK/Punjab), with an estimated cost of $1,600 million. GoAJK signed the IA and WUA in December 2020, and land acquisition is underway. Another project is the 1,320 MW Thar Mine Mouth Oracle Power Plant & Surface Mine, located at Thar Block-VI, with an estimated cost of $1,912.20 million.

China's State Grid Corporation developed the Matiari-Lahore 660 kV High-Voltage Direct Current (HVDC) transmission project, a 4,000 MW, 878 km line, including two 40 km electrode lines and associated stations, completed on September 1, 2021, at a cost of $1,658.34 million. This innovative project has significantly enhanced Pakistan's power transmission productivity, efficiency, capacity, reduced losses, stabilized the grid, and ensured consistent electricity supply over long distances.

Due to these energy projects, Pakistan's power sector has seen improved and more reliable energy supply, contributing to economic development. China's technical team provided expert services, ensuring efficient and timely completion of the energy projects, which helped achieve reliable results. In 2012, per capita power consumption was 452 kWh, and it has now increased to 511 kWh.

CPEC is structured in two main phases. Phase-1 focuses on Government-to-Government (G2G) collaborations, while Phase-2 is based on a Business-to-Business (B2B) framework. Phase-2 can enhance private sector engagement in Pakistan's power sector through joint ventures and Public-Private Partnerships (PPPs) between Pakistan and China. Pakistan seeks significant investments from China's private sector under CPEC Phase-2 to establish a stable, reliable, and efficient power sector.

The B2B framework allows businesses from both countries to collaborate, fostering technological advancements and job creation in Pakistan. Such investments can address the funding gaps in Pakistan's power sector, ensuring a reliable power supply necessary for industrial development and sustainable economic growth in the region.

In Phase-2, Pakistan aims to meet international environmental standards by adopting green energy solutions. Currently, renewable energy makes up 5% of Pakistan's energy mix, with a target of reaching 30% by 2030. China is assisting Pakistan by providing modern technology to support this transition, including eco-friendly coal power plants, advanced hydro plants, efficient solar systems, and wind power solutions. These renewable energy initiatives will improve air quality, health standards, and affordability, promoting sustainable industrial development and overall economic growth. Pakistan's energy sector currently supplies 49% of electricity to households, 26% to industry, 10% to agriculture, 8% to commercial sectors, and 7% to others.

Most CPEC power projects are based on imported coal, which increases costs for consumers and poses environmental challenges such as air and water pollution. Transitioning to local coal and renewable energy sources, such as solar and wind, can reduce electricity generation costs.

Pakistan requires $101 billion to finance renewable energy projects, construct new hydro power plants, and upgrade power transmission lines by 2040. China, with its world-leading green energy technology, can help mitigate the negative impacts of climate change in Pakistan. China's private sector can play a vital role in funding and providing technology for green energy projects. With major potential in renewable energy and electric vehicle transport systems, Pakistan can meet international environmental standards for a cleaner, greener future. Chinese banks, particularly the China Development Bank and the Export-Import Bank of China, are already contributing significantly to CPEC project financing.

While Pakistan's energy sector has achieved significant progress, it still faces challenges, including transmission losses, power theft, and increasing circular debt. Over the past five years, electricity prices for consumers have surged by approximately 300%, mainly due to the depreciation of the rupee and capacity charges to Independent Power Producers (IPPs). If these issues are not addressed, Pakistan may face mounting debt and high electricity costs, further burdening consumers with taxes and inflation. Addressing these challenges is crucial for sustaining economic development, especially as Pakistan currently relies on IMF loans to manage its debt, which negatively impacts inflation and tax rates for its citizens. Currently, Pakistan has the highest electricity cost compared to other countries in South Asia. In July, domestic consumers paid Rs. 48.84 per kWh, excluding taxes. Additionally, Pakistan is ranked 7th in the world for power outages, which negatively impacts industrial development.

The energy sector in Pakistan is facing the following challenges:

- **Project feasibility analysis:** A lack of thorough feasibility studies leads to transparency issues and conflicts between stakeholders.
- **Provincial conflict:** Inadequate transparency and facts create doubts between federal and provincial departments.
- **Security threats:** Ongoing terrorist attacks on Chinese officials complicate the implementation of projects.
- **Economic burden:** Pakistan's economic challenges, foreign debt, and rising circular debt are significant concerns.
- **Completion delays:** Delays in project completion can undermine energy security.

With China's support, Pakistan's power sector has gained access to the latest grid management systems and more efficient power plants. However, continuous infrastructure upgrades, improved governance, regulatory reforms, and national coordination in the power sector are essential. Additionally, foreign direct investment (FDI) is crucial to achieving CPEC's goals for sustainable economic growth and development.

To encourage private sector involvement from China, better coordination between federal and provincial governments is necessary. Effective communication between the National Electric Power Regulatory Authority (NEPRA), Private Power and Infrastructure Board (PPIB), and Central Power Purchasing Agency (CPPA) is vital for securing funds for renewable energy projects. Political instability can hinder policy implementation, delay projects, and discourage foreign investment.

References:

Pakistan Economic Survey 2023-24; https://finance.gov.pk/survey/chapter_24/Economic_Survey_2023_24.pdf

Ministry of Planning, Development & Special Initiatives. Energy Projects under CPEC|China-Pakistan Economic Corridor (CPEC) Secretariat Official Website; https://cpec.gov.pk/energy

Energy Projects of China-Pakistan Economic Corridor (CPEC); http://ipripak.org/publications/

Towards green energy via CPEC; https://www.dawn.com/news/1857807, Published September 9, 2024

Accelerating Green Energy Transition under China–Pakistan Economic Corridor 2.0 by Zona Usmani, Sadia Satti, and Muhammad Zulfiqar; https://www.mdpi.com/2976930

The challenge of IPPs—III Syed Shabbar Zaidi Published August 7, 2024; https://www.brecorder.com/news/40316237

Electricity in Pakistan in 2023/2024; https://lowcarbonpower.org/region/Pakistan

Renewable Energy; https://www.trade.gov/country-commercial-guides/pakistan-renewable-energy#:~:text=The%20Government%20of%20Pakistan%20renewable,wind%20energy%20market%20in%20Pakistan.

Role of CPEC in Energy and Industrial Development; https://www.researchgate.net/publication/352767328_Role_of_CPEC_in_Energy_and_Industrial_Development_of_Pakistan

World Ranking of Power Outages; https://www.dawn.com/news/1805876

China Pakistan Economic Corridor and Pakistan's energy security: A meta-analytic review; https://www.sciencedirect.com/science/article/abs/pii/S0301421518307997

About the Author: *The author is a member of ICMA and an entrepreneur, currently running a management accounting firm, Allied Financial. He has extensive experience in various services, including real estate, financial and tax consultancy, and corporate services. Additionally, he has freelanced in financial reporting and management accounting.*