



RESEARCH PAPER

CPEC-Driven Energy and Infrastructure Investments as Catalysts for Entrepreneurial Growth and Economic Development

¹Shujahat Ali, ²Adeel Razaq and ³Sheeraz Saleem

1. Assistant professor , Department of Banking and Finance, University of Kotli AJK, Pakistan
2. Lecturer, Faculty of MUST Business School, Mirpur University of Science & Technology Mirpur AJK, Pakistan
3. MS Scholar , Faculty of MUST Business School, Mirpur University of Science & Technology Mirpur AJK, Pakistan

Corresponding Author: shujahat@uokajk.edu.pk

ABSTRACT

This study is designed to highlight the impact of the CPEC on Economic development through investments in energy, infrastructure, and job creation. Secondary data was obtained from a research paper published by the Ministry of Planning and Development. As the project is in process, conclusive data constantly needs to be updated; therefore, the data used consist of facts as well as hypotheses. This study highlights the multidimensional benefits of CPEC, which will help Pakistan overcome its energy crisis that has engulfed the economic growth of the country over the past few years. Overall, national problems are probably resolved by the CPEC; for example, it will be helpful in overcoming energy deficiency, reducing the unemployment level and hence the poverty level, and improving the living standards of common men by contributing to the growth in GDP. This project will encourage the overall growth of entrepreneurship and development as a catalyst for economic growth. The quantitative method is adopted using secondary data, as the data consists of facts as well as the hypothesis, the interpretation may not provide the result with 100 % accuracy. This will help student researchers and teachers in academia understand CPEC and open new horizons for research. The results reveal that the economic corridor links economic stakeholders within a geographic location, coupled with the concentration of enormous resources and people in the uplift of an area. Society can better understand the social implications of these projects through social reforms. It is recommended that a holistic impact study be conducted to assess the effects on the economy. Expand business and entrepreneurial creations, particularly in the energy sector. Ultimately, it will affect businesses by providing the opportunity for expansion, the government by increasing it in the form of taxes, and so on.

KEYWORDS CPEC, Infrastructure, Economic Growth, Energy, Employment

Introduction

Economic cooperation forms the basis of economic development. Regional and national cooperation has been formulated for the exchange of economic and knowledge resources. The move for development known as the China-Pakistan Economic Corridor (CPEC) is a collection of different projects at an approximate cost of \$46 billion, which is roughly equivalent to 20 percent of Pakistan's annual GDP (Bhattacharjee, 2015). The China-Pakistan Economic Corridor project's ground breaking happened Islamabad on August 27, 2013 (Batool, 2016). The corridor project will add 17,000-megawatt electricity to the system at a cost of approximately \$34 billion, and the rest of the money will be spent on transport infrastructure and railway upgrading of the 1827 km track from Karachi to Peshawar via Kotri, Multan, Lahore, and Rawalpindi. Energy projects consist of coal, solar, wind, and hydropower projects (Usmani et al., 2024). All projects that are part of CPEC will be completed before 2030. Approximately 800,000 direct jobs will be created through this project between 2015 -2030 (Khan et al., 2023). As part of the infrastructure projects 1,100 km long motorway will be constructed between two large cities, Karachi and Lahore.

The CPEC is a project for a network of railways, roads, and pipelines connecting Pakistan's port city in Gwadar to China's port city in Kashgar. The four main areas are transport, infrastructure, energy, and industrial cooperation, in which both countries cooperate (VANDEWALLE, 2015). Investment in the energy sector boosts innovation and entrepreneurial activity. These investments will not only build a vibrant entrepreneurial ecosystem but also provide grounds for better monetary, higher education, and industry liaisons (Xuan et al., 2025). The CPEC covers a 2,000 km long route from Gwadar to Kashgar (Ranjan, 2015; Rahim, et. al., 2018). Unemployment and fewer job opportunities are huge hurdles to Pakistan's economic growth and prosperity.

CPEC is the frontline project of the OBOR initiative, which has enormous economic and strategic advantages for both countries (Bibi, et. al., 2025). With the inception of CPEC projects ranging from energy to infrastructure development, Pakistan's GDP is forecasted to grow to above 6% in the coming years. The projects associated with CPEC will have a significant positive impact on the economy of Pakistan, ensuring the fulfillment of energy requirements throughout the country, in addition to adding the most modernized and advanced infrastructure in the shape of rail, roads, and communication networks. The CPEC ensures greater cooperation within the field of energy, trade, and industrial and strategic cooperation, which will enhance the socio-economic development of the backward areas of Pakistan and generate employment opportunities on a massive scale, significantly affecting the lifestyles of billions of people throughout the region (Muzaffar, et. al., 2018). The CPEC is truly a game-changer for the region and an all-time opportunity for peace, stability, and economic growth in Pakistan.

Literature Review

The economic corridor links economic stakeholders within a geographic location coupled with the concentration of enormous resources and people in the uplift of the area. Economic corridors connect through hubs and zones established along a defined geography. Comparative advantages and opportunities instigate a need to establish economic corridors. Each differs from the others on the basis of its characteristics and tends to benefit more while functioning as an integral part of the global economic system and production networks (Brunner, 2013). The CPEC is a landmark agreement between the all-weather friends of Pakistan and China who will reshape the economy of Pakistan and start a new era of economic growth, stability, and prosperity. Economies such as Pakistan need greater support for energy infrastructure and policies from energy-efficient nations (Ali & Reardon, 2013 Yaseen, et. al., 2017).

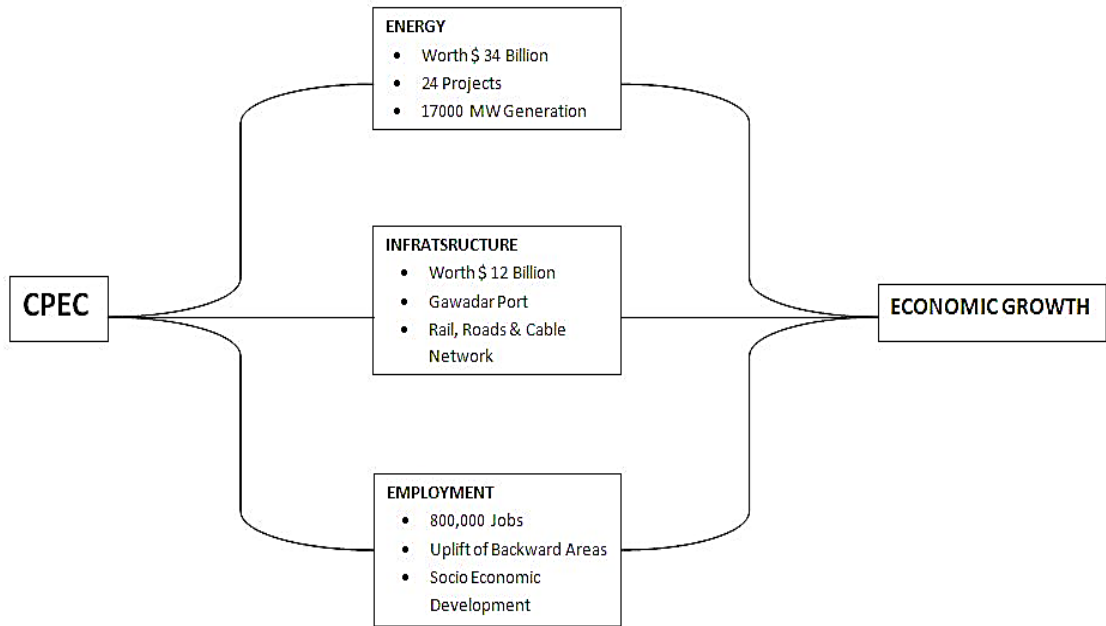
The CPEC will generate economic activities on a larger scale through different projects with key investment areas, including Energy, Communication networks, infrastructure development, and establishing industrial zones (VANDEWALLE, 2015). The benefits of CPEC are multidimensional in terms of socioeconomic development, and attract foreign investment opportunities throughout the country. The port of Gwadar is going to create a potential economic hub for neighboring countries with the prospect of generating high revenues in the shape of transit fees, taxes, and tariffs for Pakistan, in addition to significantly reducing the unemployment rate by creating thousands of job opportunities directly and indirectly in the country. The CPEC is a project to uplift backward and vulnerable areas to create an atmosphere of peace and stability in Pakistan's Baluchistan and KPK provinces. Trade activities along the CPEC route will enhance the development of the SME sector and open the doors to international markets for the country's manufacturing and service industries of the country (Shah et al., 2021). Economic activity tends to accelerate Pakistan's GDP growth rate by more than 6% in the coming years (Humayun et al., 2025).

Energy is a vital component of a country's economic growth and development. Pakistan's economic growth has been overshadowed by the energy crisis of the past few

years. There is a growing demand for energy due to industrialization and population growth in the country, while the energy supply and demand gap is widening compared with energy generation (Hassan et al., 2021). Economic growth and stability are both positively linked to a country's energy supply. The current scenario highlights the need to explore and develop the energy sector to overcome the energy demand, which is vital for economic stability in the country. Pakistan is gifted with an abundance of untapped energy resources, yet it has high potential for energy generation capacity. The CPEC provided a great opportunity for Pakistan to fulfill its energy demands, overcome the energy crisis, and lead the country on the path of economic growth and stability. A major part of CPEC investment includes establishing different energy projects at an estimated cost of \$34 billion, which will add more than 15000 MW of electricity to the national grid until the completion of the energy projects, as by the end of 2018, around 10,400 MW of electricity will be added to the existing capacity (Solangi et al., 2018). These planned projects will have a catalytic impact on attracting private sector investment in the country (Naseem, 2015). Some CPEC energy-based projects include investments in hydel, coal, wind, and solar energy segments, which have a tendency to double Pakistan's energy generation within six years (Zimmerman, 2015). Energy sector development has been given priority in the CPEC agreement, which comprises the establishment of 24 energy generation projects with an investment of \$34 billion in the different areas of Punjab, Sindh, KPK, Baluchistan, and Azad Kashmir. CPEC energy projects are expected to overcome the energy crisis, increase employment and investment opportunities, and instigate the uplift of backward areas across the country (Ali, 2021).

CPEC holds the key for various infrastructure development projects in Pakistan, including construction of rail, road transport networks, a fiber-optic cable network along the route of the corridor, Construction of Gwadar deep sea port, construction of highways and motorways, up to gradation and replacement of railway tracks from Karachi to Peshawar worth \$3.5 billion linking different cities with the trade route is part of CPEC. The development of the Gwadar seaport is the most important part of the CPEC and will be the Center Point for all trade and economic activities within the region. Various projects designed for the development of Gwadar City, including the construction of an airport with international standard facilities, establishment of export processing zones, water treatment plants, construction of hospitals, and vocational training institutes at Gwadar City, are also part of the CPEC. The entire project is well designed and multidimensional in nature, fulfilling Pakistan's energy, infrastructure, and communication needs. The construction of the Diamer Basha Dam, along with 24 different energy projects of coal, wind, thermal, Hydel, solar energy, construction and replacement of rail, road networks, construction of orange line metro trains in Lahore, and repair and rehabilitation of the Karakoram Highway linking Pakistan with China. Establishing special economic zones across different cities in Pakistan makes CPEC a great opportunity for the people of Pakistan (U.KHAN, 2015). The CPEC is a frontline project of the One Belt–One Road initiative that aims to connect three billion people with the revival of the ancient Silk Road, and a blend of energy, infrastructure, and industrial projects that will start a new era of bilateral cooperation and economic growth et. al., 2020).

Conceptual Framework



(Figure 01 is generated by obtaining ideas from different papers and data from tables).

Material and Methods

This study adopts a quantitative approach to comprehensively examine the role of CPEC-driven energy infrastructure investment in entrepreneurial growth and development. Data were gathered from reports and briefings during different periods of the project. To hypothesize the research in these areas, we employed a simple design to make it understandable for researchers and the masses.

Results and Discussion

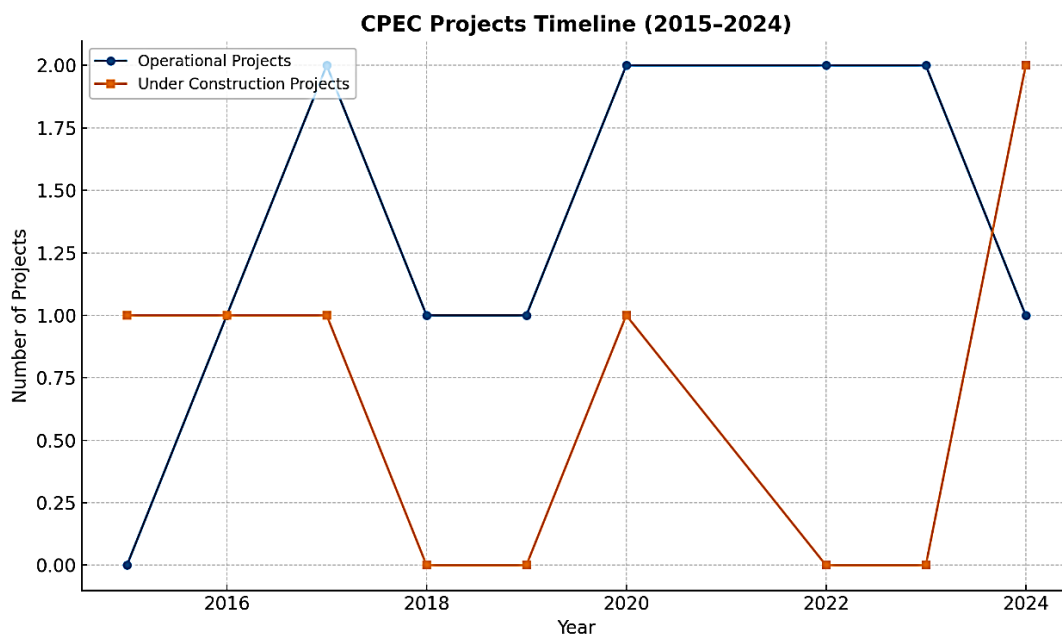


Figure 02: Under-construction CPEC projects from 2015-2024.

The data obtained from the sources were converted into graphs and tables to elaborate the situation and progress. The process is shown in Figure 02.

CPEC is a turning point for Pakistan in terms of economic growth and prosperity. Currently, the key issue is the energy crisis, which severely affects the industrial sector. Currently, global production units are linked directly to energy consumption. Energy is considered a lifeline for the economy and all industrial and domestic activities are severely affected by energy shortages. Energy shortages have a significantly negative effect on both economic growth and employment. Therefore, nations must become self-dependent in the power sector. Production units are affected and become inefficient due to the scarcity of these countries. Such scenarios discourage foreign investors from making investment decisions in Pakistan, thus affecting their FDI portfolios. Infrastructure represents the direction of the country's development. The infrastructure system connects industrial zones and hubs to each other. A well-designed and framed infrastructure course makes mobilization and approaches more convenient and faster. A highly developed and advanced infrastructure system signifies development and progress, whereas a weak infrastructure is a barrier to a nation's economic growth and international competitiveness. Infrastructure projects have an impact on socioeconomic development within a country by generating employment opportunities, ensuring the growth of the manufacturing sector, and accelerating the pace of economic growth in the country.

The projects under the CPEC are capped as per (Figure 02) timeline. These actions and projects were adjusted over time. The timely completion of these projects will strengthen economic cooperation and entrepreneurial venture creation in the energy sector.

Energy Projects in CPEC

Potentially, the CPEC is a game changer for Pakistan's economy and makes it a center for cooperation. This is of immense importance in the revival of the economy, resolution of energy deficiency, and strengthening through technology sharing, development, and infrastructure. Different energy projects will be initiated through CPEC, which fulfills the energy needs of Pakistan. These projects include Solar and Coal-fired power plants, wind energy parks, nuclear power plants, and the Hydel power projects. CPEC has invested \$ 34 billion in energy projects in Pakistan. This project is expected to add 17000 MW of electricity to the system by 2030. Currently, the country is facing severe energy shortages. Through the CPEC, 24 energy projects will be initiated in the different provinces of Pakistan and Azad Kashmir. Through CPEC, ten projects will be started in Sindh, eight in Punjab, three in Baluchistan, one in KPK, and two in Azad Kashmir (Reform, 2015). The Pakistani government has worked on these projects. Initially, 10400 MW of electricity was added to the system in 2018. The details of the different energy projects and their capacities and costs are listed in Table 1.

Table 1
Energy Projects Under CPEC till 2024

Sr. No	Project	Type	Capacity (MW)	Cost (US\$ M)	Status	Key Notes
1	Port Qasim Electric Co., Sindh	Coal	1,320	1,980	Operational (2018)	Reduced LNG reliance
2	Engro Thar Coal Plant, Sindh	Coal	1,320	2,000	Operational (2022)	Uses local Thar coal
3	Sahiwal Coal Plant, Punjab	Coal	1,320	1,600	Operational (2017)	China-Pak joint venture
4	SSRL Thar Coal Plant, Sindh	Coal	1,320	1,300	Phase 1 Operational	Mine-mouth power generation

5	Kohala Hydel Project, AJK	Hydro	1,100	2,397	Under Construction	Delayed due to financing issues
6	Suki Kinari Hydro, KPK	Hydro	870	1,870	Operational (2022)	Part of CPEC priority list
7	Quaid-e-Azam Solar Park, Punjab	Solar	1,000	1,350	Operational (2016)	Largest solar park in Pakistan
8	HUBCO Coal Plant, Balochistan	Coal	660	970	Operational (2019)	Uses imported coal
9	Gwadar Coal Plant, Balochistan	Coal	300	360	Under Construction	Aimed at Gwadar's power needs
10	Wind Farms (Jhampir Cluster), Sindh	Wind	250	659	Operational (2017-2020)	Includes Sachal, UEP, Dawood

Subtotal (Energy): 10,880 MW | \$15,486 M "Source: CPEC Authority Annual Report (2023), World Bank Infrastructure Brief (2024)."

With the commencement of these energy projects, Pakistan not only meets the current shortage of energy, but also fulfills the future energy demands of the country. These projects have provided Pakistan with economic stability and job opportunities. These projects will accelerate economic activities throughout the country and provide sustainable energy for the industrial sector. These projects also provide good job opportunities for people in the different provinces of Pakistan.

Infrastructure Development

Infrastructure is as necessary as energy is, which is important for the country. Infrastructure has both direct and indirect effects on an economy. Poor infrastructure development is a major constraint on a country's economic growth. Infrastructure is considered the backbone of an economy, and it sets the economy on a path towards sustained economic growth. The establishment of a basic and effective infrastructure in transport, utilities, and communications, such as electricity, offers an assisting environment for the private sector, which then takes the lead in the growth process. Approximately \$ 12 billion will be spent on infrastructure development through the CPEC. The details of these infrastructure projects are presented in Table 2.

Table 2
Infrastructure Development

Sr. No	Project	Category	Length (Km)	Cost (US\$ M)	Status	Key Notes
1	ML-1 Railway Line Expansion	Transport	1,736	3,650	Phase 1 Ongoing	60% funded by China
2	Karakoram Highway Phase II	Transport	440	3,500	Completed (2020)	Connects CPEC to Xinjiang
3	Peshawar-Karachi Motorway	Transport	392	2,600	Operational (2023)	Reduces travel time by 50%
4	Gwadar International Airport	Aviation	-	230	Completed (2023)	Capacity: 500,000 passengers/year
5	Gwadar Eastbay Expressway	Road	19	140.6	Operational (2022)	Links port to highways
6	Gwadar Water Supply Project	Utilities	-	130	Delayed	Critical for Gwadar's development
7	Havelian Dry Port	Logistics	-	40	Operational (2020)	Enhance rail freight capacity

Subtotal (Infrastructure): 2,587 Km | \$10,290.6 M

“Infrastructure Status: World Bank Infrastructure Brief (2024), Pakistan Ministry of Planning (2024).”

Moreover, these projects will also increase private investment in the country owing to the productive environment, infrastructure, economic opportunities, and generation of much-needed energy stability. The impact of the investment was 02 per cent between 2016-2018. CPEC is a big opportunity for Pakistan, if we use this project wisely, then country can be able to gain the economic benefits of this corridor and increase its regional power and respect.

Conclusion

The China-Pakistan economic corridor is a symbol of trust and friendship between the two nations and is truly a game changer for the region. CPEC a frontline project of Chinese's leadership vision of One Belt One Road (OBOR) initiative possesses enormous long lasting economic and strategic benefits for Pakistan and China. Pakistan, with a population of 200 million, is rich in natural resources and has high investment potential, making it an important country that the world cannot ignore. The Center Point of CPEC project is the port of Gwadar, which provides the shortest trade route to neighboring countries, including central Asian states, Iran, Afghanistan, and Gulf states, for bilateral and international trade by becoming an international hub for economic activities. It will add its share to the economy of Pakistan through revenue collection in the shape of taxes and tariffs on a larger scale. The China-Pakistan economic corridor is a project worth \$46 billion, covering energy, infrastructure, transport, and industrial development, which will reshape the economy of Pakistan and has a positive impact on the socio-economic development of the backward and vulnerable areas of KPK and Baluchistan, and ensure peace and economic stability in those areas. The benefits of CPEC are multidimensional in nature, which will help Pakistan overcome its energy crisis that has engulfed the economic growth of the country over the past few years. CPEC promises the most advanced state-of-the-art infrastructure development that will attract FDIs in the country while also creating a gap in unemployment throughout the country, with an expected employment generation of 800000 jobs in different economic sectors. The CPEC will bring together people from this region, generate employment opportunities, increase the growth of different economic sectors, and ensure hassle-free communication and mobilization across the country. CPEC is rightly termed as a game changer for Pakistan, providing an opportunity for the people of Pakistan to change their lives and become part of the most advanced and developed countries around the world. Investment in the energy sector spins off entrepreneurial development and creates an efficient model for the economy.

Recommendations

- Establishing CPEC-linked business incubation centers in all key economic zones is recommended.
- Train and transfer technology and expertise.
- Ensure sustainable and inclusive infrastructure development, particularly in the energy sector.
- Improving access to finance and support for entrepreneurs is crucial.
- Provide market linkages and support regional policies and frameworks.
- There is a greater need to establish a CPEC command control and monitoring system.

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