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Article:	**The Effect of CPEC Energy Projects on Pakistan's Economic Development**
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ABSTRACT

The China-Pakistan Economic Corridor (CPEC) project is one of the key Belt and Road Initiative (BRI) projects, which is also known as One Belt, One Road (OBOR), and is anticipated to significantly alter the regional economy. The main goal of the current study is to determine how the CPEC energy projects would affect Pakistan's socioeconomic growth. Also included in this study piece are the dangers and difficulties that Pakistan's economy may face as a result of CPEC. The urgent requirement of the hour is to draw attention to the CPEC's key problems. A variety of publications, including newspapers, magazines, journals, research articles, reports, and seminars, have been used to collect data. Pakistan has been experiencing an energy problem for the past 20 years, and the CPEC has made a significant $35 billion investment in the energy industry. Industrial parks, employment opportunities, regional integration, infrastructure development, transportation, FDI, cross-cultural interaction, tourism, etc. are just a few of the areas where CPEC is having a significant impact. Even with all of these benefits, there are still some problems, like security, political agreement, terrorism, fair funding distribution, stabilising local businesses, etc.

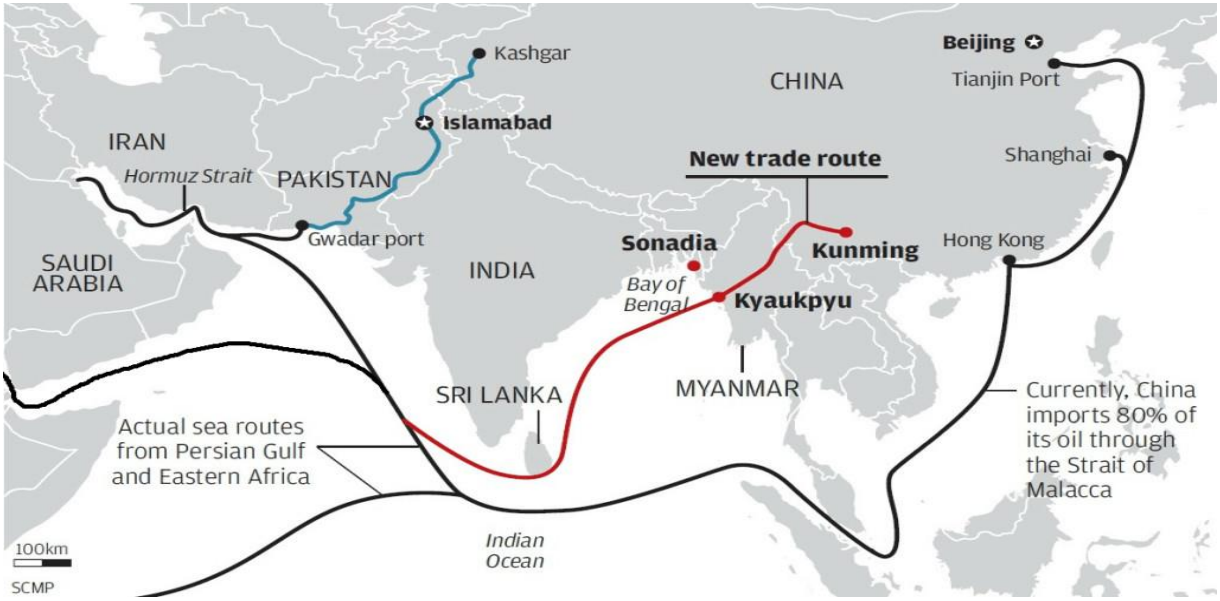
Keywords: BRI, CPEC, Energy Projects, Economic Development.

Introduction:

The China-Pakistan Economic Corridor (CPEC) provides China and Pakistan with significant benefits. In the past, foreign enterprises established themselves in the trade-friendly eastern seaside towns, leaving the western regions of China undeveloped. Also, it is expected that CPEC will make it easier for Chinese areas like Xinjiang to connect to each other by bringing in foreign and local investment to build businesses in the area. Pakistan could also be a way for China's western provinces to reach the Indian Ocean and markets in central Asia (Sarker 2018).

China's economy is the world's second largest economy, behind the United States'. It has become a global leader in important technologies such as semiconductors, rebotics, renewable energy, and electric cars as a direct result of the country's commitment to innovation and the creation of new technologies. China also has a substantial proportion of global foreign direct investment (FDI). China, like other established capitalist economies, is experiencing domestic market saturation. Domestic demand for industrial commodities, steel, cement and coal has decreased, and the nation's manufacturing titans are currently overproducing. Their "Going Out" approach addresses their demand for expansion and accumulation (Harris 2018). No matter what drives this huge BRI project, the China has already given BRI partner countries $300 billion in credit and trade funding (Casarini 2016).

Moreover, for China, the second-largest oil importer in the world, CPEC has the ability to provide energy security. Figure 1 demonstrates that China now imports around 54.8% of oil over a lengthy energy supply path. With CPEC, getting oil from the Persian Gulf and East Africa would take a lot less time and cost a lot less money (Zhang 2011).



(Ali 2016)

Figure 1. The CPEC route to China in comparison to the Strait of Malacca route

Pakistan and China have always had a good relationship. CPEC will significantly assist Pakistan in overcoming its numerous obstacles, especially its energy problem. This agreement establishes cooperation in four areas: common economic and cooperative interests; geostrategic interests; energy concerns; and security issues. It is really interesting to see that China and Pakistan share a lot of the same concerns over the safety of their energy supplies. Since many years ago, Pakistan has been struggling with an ongoing energy crisis. It is a big problem for Pakistan's economy, which is already in bad shape, because the country spends 60% of its reserves on importing fossil fuels (Ebrahim 2019).

In contrast, China's energy consumption grew so quickly during the years 2000–2008 that it was responsible for 51% of the rise in demand around the world during that time (Li and Meng 2021). Due to its fast economic expansion since 1993, China was the second largest oil user in the world in 2003, after the United States. Due to China's rising energy demands, the proportion of oil imports is predicted to increase to 60-80 percent by 2020 (Meidan 2020). Given China's rapid economic expansion and energy use, access to a sufficient energy supply is a major concern for the nation's future. On the basis of these facts, China sees Pakistan as a potential link in a regional energy supply grid. This view is shared by the United States. One reason why China is interested in Pakistan's energy resources is its location as a potential alternate energy corridor to Iran, Central Asia, and Gulf States.

In addition, Pakistan is banking on China's technological and financial assistance to diversify its energy resources through CPEC (Tiezzi 2016). The export of gas and oil accounts for fifty percent and thirty percent, respectively, of Pakistan's overall energy needs; the country's economy is therefore put under significant strain as a result. It is essential for Pakistan to incorporate renewable energy sources into its total energy mix. Prior to this, China and Pakistan had established extensive cooperation in the atomic energy sector. However, their cooperation in the hydropower sector was much more limited. Pakistan has expressed interest in obtaining China's assistance in enhancing its utilisation of renewable energy sources like sun and wind by giving it money, technology, and experience (Hussain 2017).

Since it gained its independence in 1947, Pakistan, which has a populace of thirty million people, has maintained a per capita income of one hundred dollars. Agriculture was responsible for half of the whole economy, while the industrial sector made little contribution (Pasha 2014). Taking into account purchasing power parity, Pakistan's economy is now rated 26th in the world. According to projections made by the IMF, Pakistan's GDP for FY15 amounted to 271 billion dollars. Pakistan's gross domestic product constitutes 0.39 percent of the total world economy. The GDP is broken down to be 1,427 dollars per person. The rate of expansion of Pakistan's gross domestic product in 2014 was 4.7%. The Gross Domestic Product of Pakistan grew at a rate of 4.7% in 2014 (Economics 2018). The rest of the article is structured in the following manner: The literature review may be found in Section II of the paper. Section III outlines the approach. A comprehensive explanation of challenges is presented in Section IV of this article. The conclusions of potential future suggestions are discussed in Section V.

Literature Review:

Through strategic cooperation, the Pakistan and China are establishing the China-Pakistan economic corridor (CPEC) as the most significant initiative of the $1.4 trillion US dollars BRI. China's BRI includes a vast array of industries, including culture, energy, commerce and economics, and transport sector. The BRI's physical part comprises, to the north, the "land Route (Belt)," which traverses Eurasia, and, to the south, the "Maritime Silk Road (Road)," which begins on the Chinese coast, passes across East Asia and the Indian Ocean, and terminates in Europe (Chung 2018). Two economic organisations, the "Asian Infrastructure Investment Bank" and the "New Silk Road Fund", were established in order to enable and sustain the BRI. There have been several worldwide discussions on the various elements of this gigantic Belt and Road Initiative (Das 2017). The BRI, according to the perspective and goal defined in the China's white paper, is essentially economic in character. The BRI is more than just a set of activities that happen at the same time in education, technology development, culture, and health care.

CPEC was announced in July 2013 during Pakistan's Prime Minister's visit to China. CPEC is a long-term programme that will run from 2014 to 2030 (Malik 2018). CPEC is made up of five major components.

1. Gwadar port and city development
2. Energy (LNG, wind, solar, coal, and hydel)
3. Transportation infrastructure (air, roads, and railways)
4. Investment and industrial cooperation (industrial parks and free economic zones)
5. Mutually agreed-upon areas of mutual interest

According to the data that was presented by the Board of Investment (BOI), energy projects account for 74% of the total projects that are part of the CPEC. Wind, solar, coal, and hydro are some of the energy sources that will be utilised in these projects. It is anticipated that China will invest a total of $46 billion in the project, with around $35 billion designated for the energy sector (Zimmerman 2015). The CPEC is often referred to as the PCEEC due to the fact that the CPEC project places a significant emphasis on the generation of electricity (Shaikh and Ji 2016). The World Bank Director, China's Vice Premier, Zhu Rongi and Burki, in China at the time and a Pakistani, dreamed up the PCEEC in 1993 as a way to access warm water through Gwadar, Pakistan. Shahid Javed Burki was the Director of the World Bank in China. The purpose of this plan was to facilitate the expansion of the Chinese region known as Western China through the establishment of a network of communication and transportation links between Gwadar and Kashgar. This network would consist of a road, a rail line, and an oil and gas pipeline in addition to having a pipeline.

Numerous scholarly research papers and different verities books have been published about the significance of the CPEC. CPEC is without a doubt a gigantic infrastructure development scheme that aspires to connect port of Gwadar to China via a web of motorways, pipelines, and trains networks (Younas and Aftab 2021). People in China and Pakistan see the CPEC as a way

to get jobs, improve infrastructure such as highways and rail networks, constructing brand-new special economic zones, and engaging in cultural activities.

Energy is the lifeblood of any nation, including Pakistan. Considered a crucial aspect of the socioeconomic growth of society. Pakistan is now experiencing an energy shortage of 5,400 megawatts. Pakistan is a country that uses a lot of energy and loses 2.5% of its GDP every year because of power outages. This large deficiency has significantly impacted the industrial, services, and agricultural sectors, resulting in a significant economic slowdown (Ahmed 2016). China has said that it will put $33 billion in Pakistan's 22 energy schemes through the CPEC between 2018 and 2025. These energy projects have been sponsored at a rate of 5–6% by the Exim Bank of China (Mahmood 2018). Some researchers in the academic world feel that there is a link between economic growth and energy production in Pakistan. In addition, the findings of the study indicate that energy has a positive influence on career chances. On the other hand, studies have shown that there is no correlation between energy production and the expansion of the country's economy.

When it comes to the challenges and dangers that CPEC offers to the economy of Pakistan, China has a number of strategic and economic goals in mind, some of which include the BRI, control over the port of Gwadar, and port access to Central Asia (Hao and Shah 2020). Research shows that Pakistan's economic recovery would not depend on the building of the CPEC but on the country's ability to make exports that can compete with those from other countries. Numerous and multifaceted features of CPEC's energy projects are outlined in the sources listed above. There are also several CPEC-focused studies available. To the author's knowledge, however, there is no substantial research on this topic in Pakistan. Consequently, the present research will fill this need.

Methodology:

This research is descriptive in nature. In light of this, the suggested method for the study is an exploratory literature review of the economic benefits that would come from energy projects funded by CPEC. The information came from the official CPEC website, as well as reports, newspapers, books and research articles.

Discussions:

Pakistan has reaped significant socioeconomic benefits from the PCEEC, also known as the CPEC, a flagship initiative of the BRI. The CPEC overall cost has increased from $46 billion to $62 billion. By 2030, it is anticipated that an extra $100 billion would be needed for future CPEC projects. The CPEC has reportedly spent 33 billion US dollars on Pakistan's energy schemes. The CPEC energy schemes intend to add around 17,000 megawatts of hydroelectric, solar, wind, and coal power output to the national grid (Zhang and Shi 2018). This will help meet Pakistan's growing and urgent energy needs.

According to the findings of recent studies, Pakistan had a significant energy deficit in the year 2008, amounting to 4,000 megawatts (MW), and it is expected that this deficit would increase to 8,000 MW by 2010, representing an annual growth rate of 5.67 percent. Since 2011, Pakistan

has been subjected to daily load-shedding that lasts for anywhere between 14 and 18 hours on average. In 2015, the country had an energy deficit of 5,201 MW. The latest government projections indicate that Pakistan will be able to emerge from its ongoing energy crisis in 2019, at which point the country will produce an energy surplus equal to 2,732 megawatts (MW). According to the findings of this study, Pakistan was able to create 553 MW of electricity by utilising the most up-to-date renewable energy technology, which was then linked to the country's main power system (Kamran 2018). Nevertheless, Pakistan's energy landscape relied heavily on oil to generate electricity until 2013–14, when a transition from oil to gas was observed in the power sector to generate energy for industrial, domestic, commercial, and transportation sector usage. Prior to this time, gas was the primary fuel source for Pakistan's power sector. The price of fossil fuels increased in 2009 as compared to 2008, which led to a decrease of 0.6% in overall energy supply, which in turn had a negative influence on the economy of the nation. Oil and natural gas, the two major contributors to fossil fuels, account for 64% of the resources that are utilised in the production of energy. Despite these efforts, Pakistan is unable to meet its energy requirements. This circumstance mostly impacted the industrial sector, resulting in reduced exports and negative consequences for the country's economic growth. As of July 2017, fossil fuel, hydroelectric, and nuclear power plants in Pakistan had a total installed capacity of 25100 MW and made a total of 108408 GWh of electricity (Bhutta 2021). Like in other nations, energy is a key component of Pakistan's economy. Since the previous decade, Pakistan has been experiencing acute energy shortages. The CPEC energy projects have substantially assisted Pakistan in reducing its energy deficiency. Table 1 shows the energy projects that have been finished, are still going on, or are still being planned.

	Project Name	MW	Estimated Cost (US$ M)
1	2 × 660 MW Coal-Fired Power Plants at Port Qasim Karachi, Sindh	1,320	1,980
2	Suki Kinari Hydro power Station, KPK	870	1,802
3	Sahiwal 2 × 660 MW Coal-fired Power Plant, Punjab	1,320	1,600
4	Engro Thar Block II 2 × 330 MW Coal-run energy unit	660	2,000
	TEL 1 × 330 MW Mine Mouth Lignite Fired Power Project at Thar Block-II, Sindh, Pakistan	330	
	ThalNova 1 × 330 MW Mine Mouth Lignite Fired Power Project at Thar Block-II, Sindh, Pakistan	330	
	Surface mine in block II of Thar Coal field, 3.8 million tons/year		1,470
5	Hydro China Dawood 50 MW Wind Farm (Gharo, Thatta)	50	125
6	Gwadar Coal/LNG/Oil Power Project, Gwadar	300	600
5	HUBCO coal power plant 1 × 660 MW, Hub Balochistan	660	970
6	300 MW Imported Coal Based Power Project at Gwadar, Pakistan	300	600
7	Quaid-e-Azam 1000 MW Solar Park, Bahawalpur, Punjab	1,000	1,302
8	UEP 100 MW wind Farm, Jhimpir, Sindh	100	250
9	Sachal 50 MW Wind Farm, Jhimpir, Sindh	50	134
10	SSRL Thar Coal Block-I, 6.8 mtpa & SEC Mine Mouth Power Plant (2 × 660 MW)	1,320	2,000 + 1,300
11	Karot Hydropower Station, AJK & Punjab	720	1,420
12	Three Gorges Second Wind Power Project	50	150
	Three Gorges Third Wind Power Project	50	
13	CPHGC 1,320 MW Coal-fired Power Plant, Hub, Balochistan	1,320	1,940
14	Matiari to Lahore Transmission line		1,500
	Matiari (Port Qasim) — Faisalabad Transmission Line Project		1,500
15	Thar Mine Mouth Oracle Power Plant (1320 MW) & surface mine (Thar Block IV)	1,320	1,300
	Total	**11,110**	**23,943**

Source: CPEC Secretariat, http://cpec.gov.pk/energy.

(M. Ali 2022)

Table 1. The CPEC energy projects.

Conclusion:

The primary purpose of this study is to examine the influence of CPEC energy projects on Pakistan's economic growth. The paper concluded that CPEC energy projects are beneficial in all areas, including tourism, cultural exchange, socioeconomic cooperation, regional integration, infrastructure development, industrial parks, employment opportunities, foreign

direct investment, transportation, etc. The paper also suggests that CPEC is an excellent means of presenting a positive and optimistic image of Pakistani society on a national and worldwide scale. Despite the good aspects, there remain hazards and obstacles like terrorism, security, equitable allocation of cash, political agreement, and stabilisation of local enterprises, among others.

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