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China-Pakistan Bilateral Energy Investment Agreements in the Perspective of CPEC: Environmental Challenges, Legal Issues and Recommendations

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Abstract

The purpose of the following study is to conduct a critical and in-depth investigation of the coal-based electricity projects and investment under CPEC (China-Pakistan Economic Corridor), discussing their environmental impacts, legal issues, and recommendations. This research uncovers various aspects of these projects, phases them out, and presents solutions to achieve sustainability. For this study, the researchers have chosen the qualitative research method with the help of secondary data sources and thematic analysis. Following the qualitative design, this research will uncover varied subjective data, such as the results of other studies on carbon pricing, the carbon power energy projects of CPEC, and the arbitration methods used for amicable solutions and their impacts. Additionally, using the qualitative design will allow offering more enriched and detailed outcomes, supporting a better understanding of the data. The data sources of the current research include but not limited to Acts, Statutes, International Conventions and Treaties, International Energy Reports and Statistics, Case laws as well as quality research articles, books and e-journals repositories. Through the findings of this study, it may be observed that coal-based electricity projects under the CPEC require further improvement to overcome environmental and legal issues. The solutions recommended within this study include emission trading system, significant development and work on renewable sources, carbon pricing policy and adopting best international arbitration practices. This study is significant because by examining Pakistan's coal-based energy infrastructure situation, revisiting applicable rules and regulations, and considering the bilateral investment regime, Pakistan can better manage the CPEC projects.

Keywords: *China Pakistan Economic Corridor; Carbon Pricing; Coal based Energy; Environmental Challenges; International Arbitration; Legal Issues; Renewable Energy.*
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1. INTRODUCTION

Envisioned in the middle of 2013 and started in 2015, the China-Pakistan Economic Corridor (CPEC) is a project set under the Belt and Road Initiative of China, marking a new period in the economic relationship between China and Pakistan, traditionally characterized by security cooperation. However, it is noted that CPEC is aggravating existing grievances among the population, who view it as an exploitation activity, compounded by neglect from central authorities and the suppression of dissent, which has long driven an insurrection. In the Tharparkar district of Sindh, CPEC's coal-based power projects are not only destroying the environment but also displacing local citizens from their homes, negatively impacting their livelihoods.

Moreover, the environmental effects of coal power, such as water and air pollution for the carbon emissions, have created controversies in the project. According to China, shifting the plant to Thar demonstrates their commitment to not supporting new coal projects. China claims to be well aware of the environmental issues caused by the coal project and has scrutinized the site from all perspectives, including the environmental considerations. To achieve these goals, all the coal-based power plants operating without carbon storage and an emission must be completed by the year 2040 as outlined by the Paris Agreement of 2015. Despite considering other alternatives, China identified coal as the only feasible fuel source to help Pakistan develop Gwadar and secure investment, emphasizing that sustainable power provision is essential (Ebrahim, 2023).

To analyze the data, the researchers used a thematic analysis method. This analysis is considered an effective approach due to its ability to yield varied findings regarding the coal-based electricity projects under CPEC in Pakistan. It is noted that the thematic analysis method allows the researcher to examine the data through the construction of themes from the information (Braun and Clarke, 2012). The thematic analysis was chosen because it helps in determining detailed results in an understandable manner. Thus, every objective of the study can be analyzed separately.

2. COAL-BASED ELECTRICITY PROJECTS UNDER CPEC IN PAKISTAN

There are various coal-based electricity projects under CPEC in Pakistan, such as the 1320MW Sahiwal Coal Power Plant, the Port Qasim Coal-fired plant of 1320MW, China Hub Coal Project of 1320MW, Coal-Fired Power Project of 300MW in Gawadar (cpec.gov.pk, 2023), and the most notable Thar coal power projects of more than 2,000 MWs. It is also noted that Pakistan has launched a plan to develop an imported coal plant at Gawadar under the CPEC project, due to the high cost of imported fuel, preferring to use local resources (Rana, 2022).

CPEC coal energy projects have had an impact effective on the power industry improvement of Pakistan that supported economic development by raising reduced supply at a lower cost. It is noted that the total CPEC projects installed capacity, such as the solar, hydropower, coal, and wind positions at 6570 MW. Moreover, they have developed 28549.94 and 25772.48 GWH of power in the year 2020 and 2021 respectively, and have accounted for 18.37% and 22.03% of overall production in Pakistan. The 20% average annual addition in the national grid has alleviated the widespread load shedding in the region and particularly powered the industries which are exporters from Pakistan. Moreover, it is also identified that CPEC could eliminate the energy deficit in the country which is approximately 8500 MW. The imported fuel products account for an enormous 90% Pakistan's fuel consumption, therefore CPEC will significantly improve the energy mix in a country of more than 200 million citizens. Capitalizing on native energy resources might enable Pakistan to reduce its overall reliance on imported fuel from the Middle East, which is

costly to nationwide funds (Kugelman, 2017).

3. COAL-BASED ELECTRICITY PROJECTS IMPACT ON ENVIRONMENT

An inexpensive source of energy production, coal-based plants have intense environmental implications. It is asserted that while China has created tremendous economic growth in the last few decades, it has also had a damaging effect on the environment primarily due to the unprecedented development of coal-based energy (Ali, 2018). Considering this, the CPEC-coal power projects may reduce the demand and supply gap in Pakistan. These may also have a significant impact on the environment in the long term. However, there are many issues related to carbon dioxide (CO2) emissions associated with coal-based power projects. Though engagement with different academics and civil society members, honest concerns were raised regarding the coal-based serious thoughtful environmental implications for the state. Thus, despite the high hopes connected with the energy sector's extensive investments, a shift towards coal power plants may have major long-term effects on the environment in Pakistan, as the state is already high vulnerable to climate-induced dangers (Isran, 2017). According to the 2017 Global Climate Risk Index 2017, which ranks states based on their impacts from extreme weather conditions, including fatalities and economic losses, Pakistan is listed as one of the 10 most affected states.

CPEC is not only an economic project but also holds a strategic and political significance for both China and Pakistan. Additionally, it has international implications affecting regions such as Central Asia, East Asia, West and South Asia, America, and the Gulf (Naz, 2020). Therefore, changes and negotiations to the agreements may impact overall international diplomacy and international considerations. Moreover, there may be challenges such as compensation claims, potential penalties, and re-evaluation of funding.

4. CHALLENGES AND LEGAL ISSUES IN CHANGING THE COAL-BASED ELECTRICITY PROJECTS UNDER CPEC

There are various challenges faced by coal-based electricity projects under CPEC with financial viability being a major issue. The Government of Pakistan may not be able to provide the funding that is necessary for the project's energy needs. The international financial organizations are also unable to provide the authorities with the required funding. Moreover, the circular debt issues in the power industry did not receive any attention in CPEC. Despite the problems in the sector, electricity has developed significantly as an outcome of coal-fired power projects (Rasheed et al., 2022). Furthermore, inhaling hazardous substances emitted from coal-power plants and their by-products are detrimental to human health. According to the study, coal burning is a more polluting than any other energy sources. It is

noted that burning 1 ton of coal, emits nearly 4 tons of carbon, which is the highest among all other energy resources.

The aim of this research is to propose legal reforms to accelerate the coal phase-out within CPEC in a manner that minimizes legal issues for both Chinese and Pakistani investors. This can be achieved through banning coal or implementing carbon pricing alongside electricity market reforms. However, such approaches raise significant legal questions regarding the state's capacity to reduce coal usage and prioritize sustainability. The legal aspects of decarbonization in Pakistan remain largely unexplored, despite their significance in global climate policy and Chinese investment. Certain projects focus on Pakistan and provide a critical reflection on legal reforms necessary to phase out coal by 2040.

Regarding the situation in Pakistan, the consequences of Chinese coal-based investments can be addressed or mitigated through three perspectives. The perspective strategy involves direct environmental regulation, which includes investigating the impact of stringent emissions regulations on the closure of coal-fired power plants, thereby restricting coal-powered operations. The second perspective involves conducting an assessment of the financial impact on electricity, analyzing how market-based electricity and carbon pricing reforms could facilitate the phase-out of coal. Similarly, the third perspective entails a thorough analysis and critical study from environmental, social, legal, and economic perspectives. This would help estimate the implications of these reforms on Chinese investments and explore legal pathways for expediting coal phase-out. Based on this research, recommendations are formulated to enhance coal restrictions with minimal impact on investor rights in Pakistan.

5. CARBON PRICING POLICY OF PAKISTAN

The proposition of carbon pricing policy in Pakistan can be considered a major strategic action to address the climate change objectives and commitments of the country including the Paris Climate Agreement. Pakistan relies for most of its energy needs on coal and other fossil fuels, Pakistan has the herculean task of shifting towards cleaner forms of energy. Carbon pricing, which encompasses carbon taxes and cap-and-trade systems among others, has a simple practical way of discouraging carbon emissions while at the same time making renewable energy sources cheaper to compete with the carbon emitting sources of energy. For example, carbon taxes require the polluter to pay a direct monetary amount based on the volume or weight of carbon in fossil fuels. This approach is quite direct in the sense that it motivates industries to cut back on their emissions to save money at the same time, it also creates government revenue that could be reinvested into projects such as renewable energy plants or energy efficiency modernizations. One good example of this strategy is Sweden this country has probably the highest carbon tax rate in the world and has been able to realize deep cuts in carbon emissions while at the same time registering impressive economic growth (Anser, Ahmad, et al., 2021).

While a cap-and-trade system introduces a maximum allowable

amount of emissions for greenhouse gases and provides these emissions with permits that can be bought and sold by companies. This method offers an economic signal to firms to be innovative and bring changes for cutting down emission levels in an effort to trade surplus permits. The European Union's Emissions Trading System (EU ETS) is an example of an implementation of this system whereby, having set an emissions ceiling, the organization progressively lowers it to ensure that the levels of greenhouse gas emissions reduce (Anser et al., 2020). In addition, Pakistan has international commitments under treaties like the Paris Agreement that was acceded by Pakistan in 2016 to reduce and limit greenhouse gas emissions and to adapt it to the operational consequences of climate change by providing further assistance to other developing nations for the same. In this regard, carbon pricing could be used not only to achieve these goals but also possibly to obtain financial resources from abroad, for example, climate finance in the framework of the GCF. These funds could go towards covering the setup cost of carbon pricing systems and further dampen the economic effect.

However, the introduction of carbon pricing policy in Pakistan is not without risking the country's economy, especially in organizations that use inexpensive coal energy (Bompard et al., 2022). Another plausible argument is the feeling, that due to carbon pricing, more costs can appear suddenly affecting certain industries' competitiveness and, therefore, jobs and prices on the consumers' side. To this end, any policy aimed at the use of carbon prices should incorporate the following steps: It should be implemented gradually; sectors affected most by the change should be given enough time to adapt; and the policy should include provisions for compensating the losers, be they particular industries or certain groups of the population (Anser, Khan, et al., 2021). Thus although, the use of carbon pricing in Pakistan is an excellent suggestion for the country to decrease the level of its carbon emissions, the approach should be well thought-out and come with solid legal foundations and proper economic calculations. Thus, only with the further synchronization of national legislation with the requirements of international environmental obligations and guaranteeing the minimization of economic consequences through the proper elaboration of policy measures, Pakistan can unleash the maximum potential of carbonization to achieve climate targets efficiently (Khurshid et al., 2023).

The introduction of carbon pricing in Pakistan offers a complex solution, mainly because of the country's economic relations and the political aspect of the energy sector. Pakistan's economy depends a lot on the coal and other non-renewable sources of energy which are subsidized to keep energy prices low for the consumers and various industries (Khurshid et al., 2022). The transition to a carbon pricing instrument whether a carbon tax or a cap and trade system requires a lot of careful planning to avoid the adverse effects on the economy and particularly sensitive populations. For example, carbon pricing could lead to higher costs for energy which could be unbearable especially to low income earners and small to medium enterprises, which are more vulnerable to cost shocks (Akhtar et al., 2022). Hence, the formation of

an effective carbon pricing policy must entail instruments such as revenue recycling which can be used to underlay the purchase of renewable energy for the underdeveloped or rural regions or actual rebates to consumers to cushion them from the high energy costs. Such measures would not only act as a shock absorber to the economic effect but would also help in a more effective transition to the green energy sources.

Regarding the legal initiatives, Pakistan has to fit its attempts to introduce carbon pricing into the national legislation on the environment as well as into the organization's international treaties. Presently the law used for framing the policies is Pakistan Environmental Protection Act (PEPA) 1997 and this law does not have provisions regarding carbon emission or price of carbon. Hence, more legislations or new legislation on carbon pricing would be necessary to have a legal framework that addresses carbon pricing in compliance with international environmental laws and conventions including the Paris Accord. Also, Pakistan must pay attention to its commitments it made to UNFCCC and Kyoto Protocol that support the economic instruments like carbon pricing for achieving the intended low-carbon economy. These international conventions offer the guidelines for the accountability of emission reduction and tracking of progress which not only assist Pakistan in achieving the emission reduction goals but also in enhancing its position in the international forums for environmental concerns.

6. THE ROLE OF ARBITRATION IF THE COAL-BASED PROJECTS CONFLICT REFERS TO THE ARBITRATION CENTRE

Arbitration is one of the significant tools available in the sphere of international dispute resolution especially in relation to energy contracts linked with diverse coal-oriented ventures in Pakistan. The use of arbitration clauses in these contracts is basically designed to make it possible that any emerging disputes avoid the rather conventional and possibly unpredictable court procedures but rather go for a more neutral, rule-based arbitration. More to the point, these ventures are more or less consistent with the so-called CPEC projects, which entail a tremendous amount of Chinese money, meaning the risks are higher. The choice of the arbitration institutions often names entities like ICC or SIAC as preferred for their neutrality and efficiency of the processes in their procedures. This is because of past occurrences like the KKEU and Islamic Republic of Pakistan where the International Centre for Settlement of Investment Disputes (ICSID) was applied. The amounts of money awarded to KKEU by the tribunal for wrongful contract termination also underlines the necessity of the financial consequences of the decision as well as the fact that arbitration awards are final (Goldberg et al., 2020). Such outcomes not only prove the efficiency of the arbitration in the settlement of critical international disputes but also show that a huge sum of money might be recovered in case of non-fulfillment of contractual obligations, which still emphasizes the severity of the situation.

The challenge emerges when these environmental responsibilities are

addressed together with investors' legal rights under IIL, including those provided by the ECT. The ECT allows the investors to claim the right to fair and equitable treatment and the latter can be interpreted as the right for a stable environment. That is why, any changes in policies or cancellation of projects can be considered as the violation of this treaty and further filing of arbitration claims against Pakistan. This raises a major conflict of interest for Pakistan. Because, on one hand, the country is bound to protect environment while on the other hand, it has to ensure that Chinese investors under CPEC deals are safeguarded. However, the execution of the arbitration awards in Pakistan has some technical issues of its own. Despite the fact that the country is a contracting party to the New York Convention on the Recognition and Enforcement of Foreign Arbitral awards which makes it easier to enforce arbitration awards from other countries there is still resistance when it comes to the enforcement of such awards locally. This was the case especially after the Tethyan Copper Company arbitration when challenges in enforcing the award revealed tensions between international arbitration decisions and domestic legal frameworks. Such instances indeed give rise to pertinent questions pertaining to the ability of arbitration in situations where national interest and international legal obligations are in conflict (Zeller & Trakman, 2019).

The choice of the neutral venues and the use of foreign legislation, for example the United Kingdom or Singapore laws, can be considered as part of a global plan, which was designed to avoid unpredictability and domestic approaches of the national legal systems. It is useful especially taking into account rather large investments and the number of strategic projects, which often become an object of influence by nationalist policies and domestic political processes. For instance, the choice of English law, which is particularly renowned for its detailed precedents and principles in contract and commercial law means that there is a familiar and comparatively stable legal environment for both parties to operate in. This choice is rather typical for the contemporary international contracts to rely on the legal systems of the countries with rich legislatives and jurisprudences in order to be confident that the contracts will be legally sound and their enforcement predictable.

However, these arbitration clauses that have been negotiated a fine detail must also take the dynamic nature of the international environmental law, especially within the climate change framework. Since Pakistan has also signed the Paris Agreement, it has agreed to cut down on carbon emission and move towards the sustainable energy sources. This international commitment requires reconsidering the existing and planned energy initiatives, particularly those of CPEC that are mainly coal-fired power plants which contribute immensely to carbon emissions (Donaubauer et al., 2018). The legal regime set out by the Paris Agreement is not specific on how to attain these reductions, but it indirectly pushes the signatories to eliminate the less sustainable sources of energy. This means that there is a possibility that the contractual relations within CPEC may contradict Pakistan's international environmental responsibilities.

The Pakistan Environmental Protection Act of 1997 and other domestic laws of have legal provisions to empower the government to take measures for the conservation and protection of environment. This act might be construed to mean a lack of enforcement of arbitration awards that are perceived to be prejudicial to the environmental policies of the nation. Here is the possible conflict between protection of the international commercial treaties and the promotion of national environmental goals. This tension underlines the fact that there is in most countries a complex balance that has to be made between the legal requirements of the country and the environmental concerns of the country in question, In this case Pakistan.

While arbitration is effective, free from bias and time consuming, it is also time-consuming and carries some decreases that some times more less useful in cases that the of public interest or those concerning the environment. The first major drawback is the cost implication of the arbitration process. Arbitration is generally costly because it comprises of the arbitrators' fees, counsel fees, and administrative charges from the arbitration center. In the case of states such as Pakistan, which remain financially limited, this can prove to be a real problem because the costs of arbitration are high (Brekoulakis, 2019). This is even more so in the cases with significant financial turnover like the large-scale infrastructure or energy projects under such programmes as CPEC, where the scale of the cases' financial implications and their specific nature entail the need for the most sophisticated legal advice. In addition, the undertaking can take time, in the range of several months or years, due to comprehensive preparation and strict adherence to procedures. This not only increases costs but also heightens the time taken to address important matters concerning energy projects and environmental management; this may slow down the putting into effect of essential environmental policies or even the commencement of developmental projects that are vital for the country's progress.

7. RECOMMENDATIONS

a. Develop a Comprehensive Energy Transition Plan

Pakistan should formulate a detailed energy transition plan that supports nation compliance with to the Paris Accord. This plan should detail strategies and timeline of phasing out the use of coal-based energy and progression towards renewable energy within the national energy mix. It should also contain plans outlining the Connected Grid roadmap, the transmission system roadmap, and the roadmap for integrating renewable energy solutions.

b. Strengthen Legal and Policy Frameworks

Due to a heavy dependency on non-renewable sources, Pakistan requires the enhancement of its legal and policy measures to move towards renewable energy. This includes passing new amendments to the NEPRA regulations as well as the AEDB policies to afford more incentives to the renewable energy projects. The government should be working on the simplification of the

approval point, lessening of bureaucratic encumbrances and ensuring of legal certainty to foster local as well as foreign investments.

c. Enhance Financial Mechanisms

The creation of renewable energy facilities requires much of capital for its creation and incorporation. There is also the question of what instruments can be used for climate finance in Pakistan; it is recommended that Pakistan should look into unconventional methods like green bond schemes and PPPs and international climate finance. Similarly path the government can also design a renewable energy fund that will offer loans as well as subsidies to the renewable energy undertaking.

d. Promote International Cooperation

International cooperation is a matter of great importance for Pakistan when it comes to the transition to clean energy. The government should proactively solicit for assistance, technical and financial, from IGOs, multilateral development banks, as well as countries with proven capabilities in renewable energy technologies. Specifically, deepening cooperation with China due to their competencies and experience in the use of renewable sources seems promising within the framework of cultivating partnerships with other countries. Similarly, collaborative R and D efforts can also enable Pakistan to implement advances in Technologies for Renewable Energy.

e. Implement Carbon Pricing Mechanisms

Speaking of carbon pricing mechanisms as carbon taxes or cap-and-trade systems, it is possible to encourage the decrease in greenhouse gas emissions. These techniques keep on generating certain revenues that in turn, are utilized in supporting renewable energy undertakings and energy conservation measures. Thus, by adopting a phased implementation plan, industry will be ready to adjust as necessary and reduce on the overall impact on the economies of the world.

f. Invest in Grid Modernization

An effective national grid system that is capable to absorb the uncertainties of the renewable energy generation is therefore required. Pakistan should invest in grid modernization in order to ease it to manage intermittent electricity source such as solar and wind. This includes investing in smart grid solutions, energy storage solutions, and increasing grid accessibility.

g. Focus on Capacity Building and Training

It is imperative that there is an active construction of local capability in renewable energy technologies. The government should also train the people to support renewable energy since the industry needs well-trained personnel coupled with certification programs and links with academic institutions. Another advantage of capacity building is that it lessens reliance on foreign skills and expertise hence promoting sustainable development.

h. Encourage Public Awareness and Participation

Educational initiatives to expand people's understanding of the advantages of renewable energy and the need to decrease their carbon footprint can contribute to the support of the energy transition. Decision-making processes should involve the communities, industries, and CSOs to fully represent the people's interests.

i. Develop a Just Transition Strategy

It is crucial to have a just transition policy to regulate the shift from coal usage since it has negative economic repercussions. It should also detail plans for transitioning workers and the communities that depend on these coal plants to other economic activities like, retraining programs or jobs placements for the laid off employees, and economic diversification to provide for the needs of the communities that depend on the plants for their source of income.

j. Monitor and Evaluate Progress

Establishing a structure for the monitoring and evaluation of the energy transition plan is essential to track its implementation. Evaluation can be used to determine what obstacles may exist, how the newly adopted policies perform, and what modifications must be made to guarantee the plan's success. If the mentioned recommendations will be pursued, Pakistan will be able to transform from the use of coal as an energy source to renewable and become an energy secure as well as an ecologically sustainable country that will fulfil its commitments within the framework of the Climate Change Convention.

8. CONCLUSION

Pakistan is on strategically important economic trajectory where, on one side, it is aiming to achieve its economic development goals. On the other hand, it is burdened with environmental sustainability challenges. Renewable power sources are not only legal and environmental requirements but also, they are economic and social requirements as well. This work has endeavored to describe the transition as not limited to energy systems solely but requiring inclusive energy policies, enhanced infrastructure, collaborations with other nations, and creative approaches to funding. The first recommendation is the development of national and regional energy policies that give serious considerations to renewable sources of energy. The Alternative and Renewable Energy (ARE) Policy should be enhanced so that it provides clear and realistic goals for the expansion of the role of renewable energy sources in total energy consumption. This policy should encourage the private investors, especially in the development of contracting solar, wind, and hydroelectric power projects through providing tax incentives and subsidies and dealing with repetitive bureaucratic hurdles. By improving the policy environment, there will be the realization of a favorable environment for renewable, thus attracting local and international investors. However, most importantly, it is critical to create a special authority to regulate the renewable energy sector and the implementation of the policies above. Carbon taxes and cap and trade policies will help in reducing the amount of carbon emissions by imposing a price on

carbon. They will help in funning the renewable energy subsidies. Green bonds enable private capital for sustainable infrastructure projects, and their access to International Climate Funds like Green Climate Funds will be useful for large-scale renewable energy generation. Further, the studies regarding the environmental advantages of adopting renewable energy resources, like cleaner air and water, as well as a decrease in greenhouse gas emissions, would offer a strong argument for boosting the pace of change to renewable energy sources. Comparative examinations with other countries, which have faced a similar challenge of the shift from the utilisation of coal to renewable energy, may yield useful insights and experiences.

Thus, Pakistan's transition from of coal-based energy to renewable energy is not an easy process. Still, it is more sensitive and comprehensive and addresses various sectors such as policy, technology, finance, and cooperation. Adopting various energy policies, improving infrastructures, enhancing cooperation across the globe, and developing research can help Pakistan build a sustainable energy system in the future. The proposed structural change will help Pakistan fulfils its global climate commitments and achieve the goals of energy self-sufficiency and development. The listed recommendations above point insight into this transition process by pointing towards the necessity of well-coordinated and multi-faceted efforts in policy-making, technology development, financing, and cooperation at the international level.

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