PRIED
Policy Research Institute
for Equitable Development

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Sustainable Development Policy Institute

OPTIMISING THE CHINA–PAKISTAN ECONOMIC CORRIDOR

Reform agenda for CPEC 2.0

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Acknowledgement

We extend our sincere appreciation to an esteemed constellation of contributors who have helped us illuminating our report with their expertise. We extend our heartfelt gratitude to the organizations and acknowledge their inputs for our study, especially Board of Investments (BOI), National Electric Power Regulatory Authority (NEPRA), Ministry of Energy, who enriched our deliberations, provided invaluable insights through extensive stakeholder consultations, shaping our study's discourse profoundly.

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Acronyms and Abbreviations

CPEC	China-Pakistan Economic Corridor
BRI	Belt and Road Initiative
G-G	Government to Government
B-B	Business to Business
SEZs	Special Economic Zones
GDP	Gross Domestic Product
IFM	International Monetary Fund
PPA	Power Purchase Agreement
SSD	Special Security Division
IGCEP	Integrated Generation Capacity Expansion Plan
NDCs	Nationally Determined Contribution
NDRC	National Development and Reform Commission

Transitioning the CPEC

1.1. Brief history

The idea for China-Pakistan Economic Corridor (CPEC) was proposed by Chinese Premier Li Keqiang during his visit to Pakistan in 2013. A preliminary study to operationalize CPEC was completed in 2014, highlighting the importance of a China-run port near the Gulf of Oman[1]. Consequently, ideas were conceived to integrate the western Chinese city of Kashgar with Gwadar district of Balochistan[2,3]. A year later, CPEC came into effect -- under a larger Chinese plan called the Belt and Road Initiative (BRI) – when Chinese President Xi Jinping and Pakistani Prime Minister Nawaz Sharif signed 51 agreements and memorandums of understanding valued at 46 billion US dollars[4], mainly involving various road networks and energy generation projects.

These projects aimed at modernizing Pakistan's infrastructure, including road, rail, and energy infrastructure. These included the construction of various motorways, Karakoram Highway, coal-based power plants. By the end of 2020, the value of these Chinese-financed and Chinese-built projects in Pakistan stood at 62 billion US dollars[5]. In the energy sector alone, direct Chinese investments stood at 25.4 billion US dollars[6].

All these projects were carried out under government-to-government (G-2-G) agreements but involved loans and grants provided both by the Chinese government and the Chinese banks. In the second phase of CPEC (or CPEC 2.0), the focus is mostly on business to business (B-2-B agreements for industrial development, agricultural modernization and energy transition. The only major G-2-G agreement would be about a dual-line rail corridor that links Karachi with Peshawar.

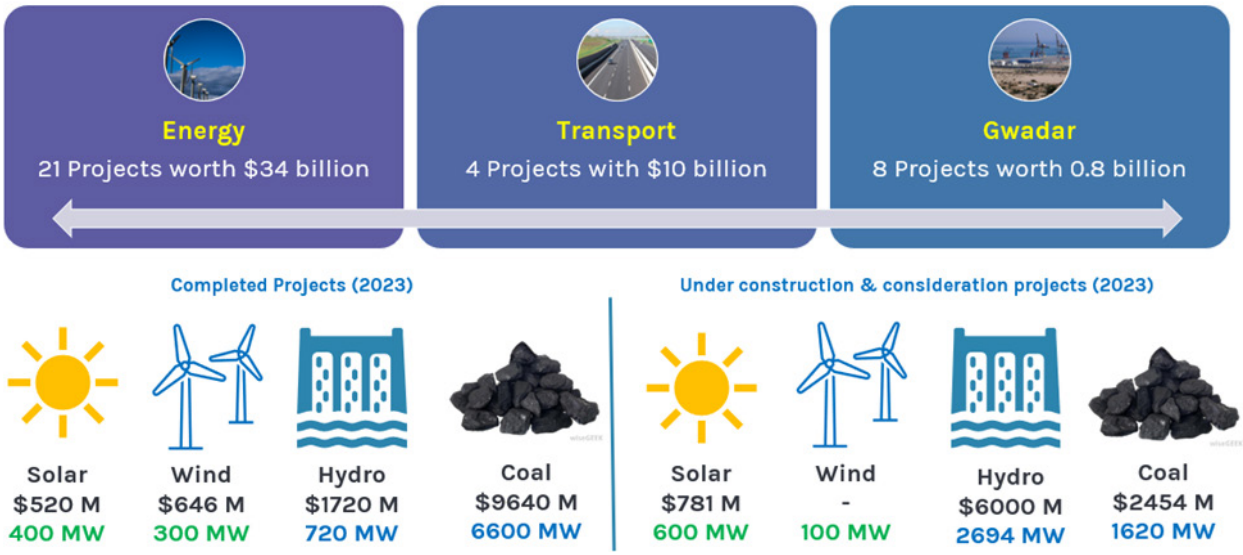

Figure 1: Investments and developments under the CPEC

1 https://pakobserver.net/cpec-history-background-challenges-and-way-forward-by-ahmad-jawad/?form=MG0AV3
2 https://www.crisisgroup.org/asia/south-asia/pakistan/297-china-pakistan-economic-corridor-opportunities-and-risks
3 https://pssr.org.pk/issues/v4/1/china-pakistan-economic-corridor-prospects-and-challenges.pdf
4 https://www.britannica.com/topic/China-Pakistan-Economic-Corridor
5 https://en.wikipedia.org/wiki/China%E2%80%93Pakistan_Economic_Corridor
6 https://www.dawn.com/news/1856301/building-confidence-for-cpecs-success

1.2. Energy projects

Multiple energy projects have been launched under CPEC in Pakistan. The following table provides their brief descriptions:

Table 1: Energy projects built under CPEC in Pakistan

Serial No.	Project	Installed Capacity (in megawatts)
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 / 600
6	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	Karot Hydropower Project, Azad Jammu and Kashmir	720
11	HUBCO Thar Coal Power Project (Thar Energy)	330
12	Shanghai Electric SSRL Thar Coal Block-I mine of 7.8 MTPA	1320
13	HUBCO ThalNova Thar Coal Power Project	330
14	Suki Kinari Hydropower Project, Khyber Pakhtunkhwa	870
15	Matiari to Lahore Transmission Line	With 4,000 megawatts evacuation capacity

Apart from the projects already completed, several other plants are under various levels of consideration. These include:

Table 2: Energy projects under consideration under CPEC in Pakistan

Serial No	Projects	Installed Capacity (in megawatts)
1	Coal-Fired Power Project at Gwadar	300
2	Kohala Hydropower Project, Azad Jammu and Kashmir	1124
3	Azad Pattan Hydropower Project, Azad Jammu and Kashmir	700.7
4	Thar Mine Mouth Oracle Power Plant & surface mine	1320
5	Cacho Wind Power Project	50
6	Western Energy (Pvt.) Ltd. Wind Power Project	50

Energy projects completed under CPEC are facing an array of challenges. Many of them rely on imported coal for power generation which is becoming difficult to maintain because Pakistanis often do not have enough money for the coal imports. The utilization rate of these power plants has also declined by 20-30 percent, given that Pakistan installed generation capacity of more than 45,000 megawatts is way above its peak demand of around 27,000 megawatts.

1.3. CPEC 2.0: What, Why and How

As CPEC's first iteration moves towards completion, Chinese and Pakistani authorities signed new memorandums of understanding (MoUs) to boost Pakistan's industrial output and economic growth through B-2-B engagements -- as opposed to G-2-G engagements which were the cornerstone of CPEC's Phase I[7,8]. The focus in the second phase of CPEC is specifically on public-private partnerships and green technology, which have been endorsed by ministers and policymakers, as well as private sector players in Pakistan[9]. Pakistan has highlighted 13 key sectors — including energy, mines and minerals, iron and steel, chemicals, fertilizers, textiles, leather, information technology and services — where it is seeking Chinese investments under CPEC 2.0. Many events have been scheduled in Pakistan and China, such as the Shaanxi-Pakistan Economic and Trade Cooperation Fair – which are aimed at to persuading Chinese investors to invest in these sectors[10].

The understanding to develop CPEC 2.0 was reached at the 5th Round of the Pakistan-China Foreign Ministers' Strategic Dialogue co-chaired by Pakistan's foreign minister Ishaq Dar and Chinese foreign minister Wang Yi in May 2024 in Beijing. Marking a decade of CPEC, the two sides agreed that its second phase should focus on subjects such as growth, livelihood-enhancing, innovation and green technologies and aligns them with Pakistan's

7 *https://www.pakistantoday.com.pk/2024/09/20/higher-than-the-himalayas/*

8 *https://www.pakistantoday.com.pk/2024/09/20/cpec-phase-ii-to-help-pakistan-transform-its-economy-pm/*

9 *https://www.samaa.tv/2087321424-minister-abdul-aleem-khan-stresses-cpec-s-role-in-economic-growth*

10 *https://www.pakistantoday.com.pk/2024/09/22/pakistan-identified-13-priority-sectors-seeking-chinese-investment-envoy/*

development framework and priorities[11]. The two governments have identified around 70 projects for potential collaboration[12] under this phase. Diamer Bhasha Hydropower Project (DBHP), costing 8 billion US dollars has also been included CPEC 2.0 under the directions of Prime Minister of Pakistan[13].

Several Special Economic Zones (SEZs) -- Rashakai Economic Zone (Nowshera, Khyber Pakhtunkhwa), China Special Economic Zone, Dhabeji (Sindh), Bostan Industrial Zone (near Quetta), Punjab-China Economic Zone (Sheikhupura), ICT Model Industrial Zone (Islamabad), Industrial Park on Pakistan Steel Mills Land (Port Qasim); Bhimber Industrial Zone (Azad Jammu and Kashmir) Mohmand Marble City (Khyber Pakhtunkhwa) and Moqpondass SEZ (Gilgit-Baltistan) – are also being set up under CPEC 2.0.

Vision for CPEC 2.0

CPEC 2.0 aims to upgrade, promote and implement measures that are focused on industrialization, sustainability and inclusivity. It includes five corridors, each serving specific purposes ranging from growth and innovation to sustainability and regional connectivity. These are:

- **Corridor of growth** -- emphasizes long-term planning and overall management of the country;
- **Corridor of life enhancing** -- aims to create jobs and improve living standards for local people;
- **Corridor of innovation** -- focuses on high-tech areas like mobile communications, e-commerce, artificial intelligence and cybersecurity';
- **Green corridor** -- integrates the green Silk Road and Green Pakistan initiatives;
- **The corridor is open** -- invites participation from other countries to enhance regional connectivity and investment.

CPEC 2.0 also aims to strategically align these five Cs with the five E framework prepared by Pakistan's Ministry of Planning Development & Special Initiatives[14]. These Es include Exports, E-Pakistan, Environment and Climate Change, Energy and Infrastructure, and Equity and Empowerment[15].

The pillars of the 5-E framework include seven following key drivers and enablers of growth envisaged in the government documents:

1. Achieving sustainable, indigenous and inclusive growth
2. Energy, water and food security
3. Institutional reform and democratic government
4. Putting people first
5. Private sector-led growth

11 *https://www.radio.gov.pk/16-05-2024/pakistan-china-reiterate-resolve-to-further-deepen-ties*

12 *https://profit.pakistantoday.com.pk/2024/09/23/pakistan-prepares-over-70-projects-for-chinas-cooperation-in-cpec-phase-ii/*

13 *https://www.brecorder.com/news/40325835*

14 *https://www.app.com.pk/business/pakistan-china-to-form-wg-on-5-new-economic-corridors-under-cpec/*

15 *https://tribune.com.pk/story/2460230/phase-2-of-cpec-accelerated-with-new-economic-corridors*

1.4. Energy, economy and debt

Since its inception, CPEC has significantly impacted Pakistan's energy sector and boosted its generation capacity, helping to alleviate its energy shortage crisis. CPEC's focus on coal-based power plants, however, has created many social and environmental concerns[16]. Figure 2 reflects that the coal and hydropower-based projects dominate Pakistan's energy mix under CPEC implemented projects. These energy projects have also increased Pakistan's reliance on imported fossil fuels, making it vulnerable to price fluctuations in the global market and putting heavy pressure on its balance of payment.

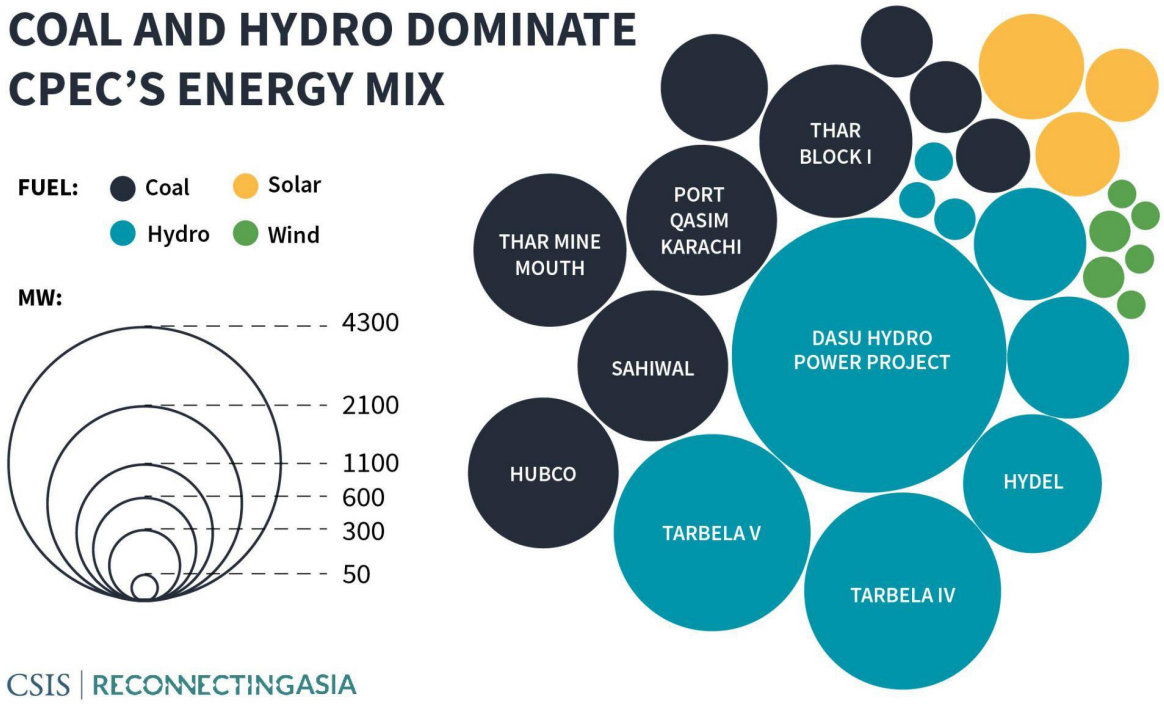

Figure 2: Energy mix of projects under CPEC in Pakistan[17]

Meanwhile, Pakistan's external debt has risen significantly due to CPEC-related loans[18] . To contextualize this debt burden, it is important to highlight that the country's foreign debt was estimated to be almost 125 billion US dollars in 2023 -- roughly 42 percent of its gross domestic product (GDP)[19]. The International Monetary Fund (IMF) estimates that Pakistan's debt service requirements would be around 25 billion US dollars in 2023-24. As per China Global Investment Tracker[20] Chinese investments and contracts in Pakistan between 2005-23 are worth over 65 billion US billion dollars. Out of these, 47.5 billion US dollars are in the energy sector. Consequently, Pakistan owed 24.7 billion US dollars to China in 2021[21] whereas it owed only 7.6 billion US dollars to China in 2016.

16 *https://www.priedpk.org/wp-content/uploads/2023/01/Research-Study-Coal-rush-The-impacts-of-coal-power-generation-on-Tharis-land-rights-1.pdf*

17 *https://www.csis.org/analysis/china-pakistan-economic-corridor-five*

18 *https://pide.org.pk/research/cpec-and-pakistans-debt-burden/?form=MG0AV3*

19 *State Bank of Pakistan (SBP).*

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

21 *https://www.usip.org/publications/2021/05/pakistans-growing-problem-its-china-economic-corridor*

The graph presented in figure 3 highlights the changes in Pakistan's overall debt profile from 2013 to 2022, with debt ranging from the Chinese government, banks, and other bilateral and multilateral contracts.

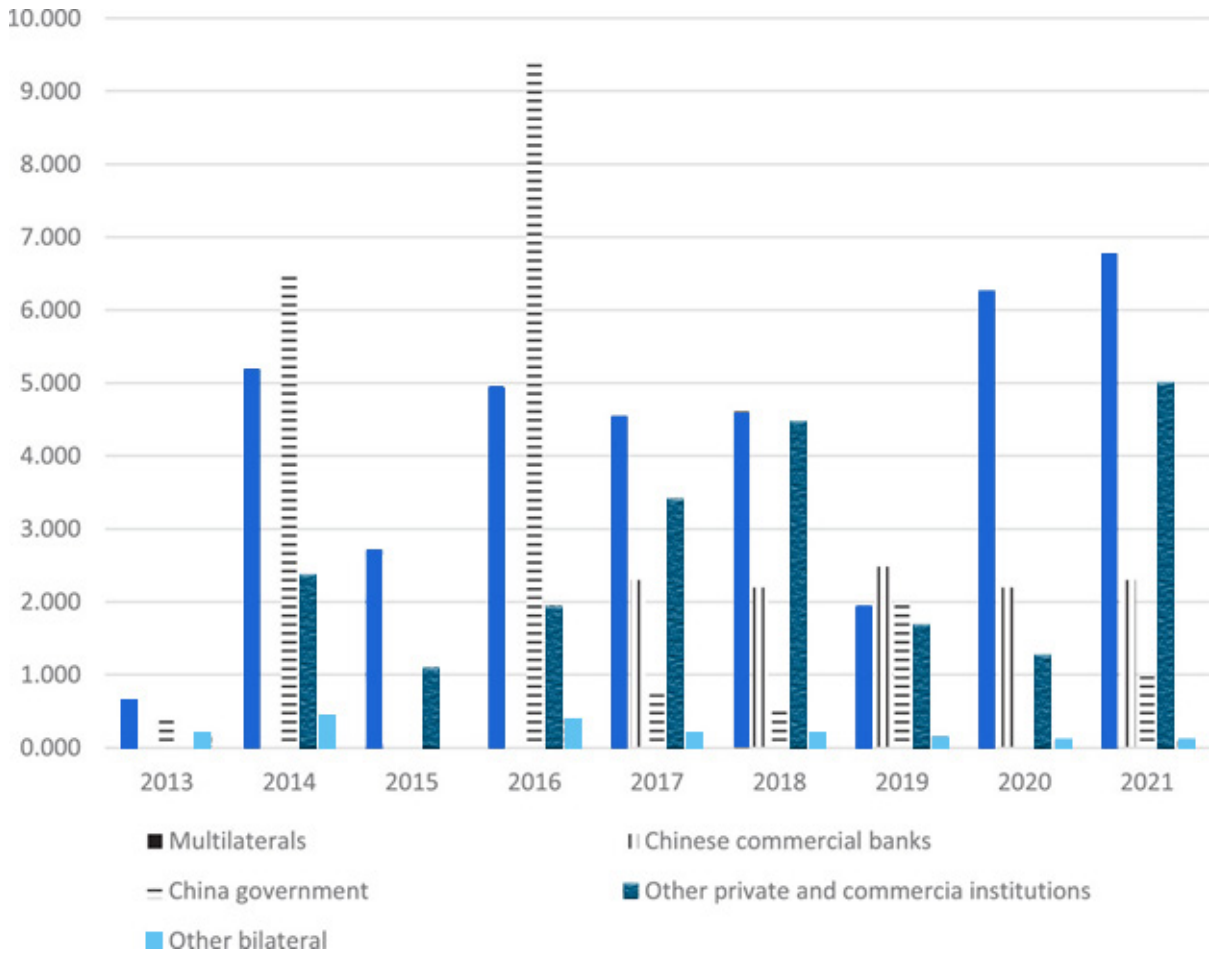

Figure 3: Pakistan's changing debt profile in US$ billions. (Source: Ministry of Finance - 2022)[22]

This situation has led to concerns that, in spite of having made much-needed increased Pakistan's energy and transport infrastructure, these loans are so big that they could affect Pakistan's ability to pay them back. Since Pakistan is already taking more loans to return its previous loans, its increasing debts can create a debt trap that it might not be able to come out of.

There are also fears that if Pakistan cannot generate enough revenue from its CPEC projects, it might have to give up its strategic assets to China in return for the unpaid loans. This is what has happened in Sri Lanka with reference to its Hambantota port[23,24]

Delays in the implementation of CPEC projects – as well as in the payment of their dues -- have also posed serious financial challenges. This explains why China linked its investment in the second phase of CPEC with the priority return of loans and other dues Pakistan owes to it. These repayments have become highly untenable given that they are often dollar-indexed which means that any depreciation of Pakistani rupee increases Pakistan's financial burden in a massive way.

22 *https://onlinelibrary.wiley.com/doi/full/10.1111/dech.12798?msockid=2f7bc41746a862ba166fd5aa471c63da*

23 *https://pide.org.pk/research/cpec-and-pakistans-debt-burden/?form=MG0AV3*

24 *https://pakobserver.net/cpec-prospects-and-challenges/?form=MG0AV3*

All these developments are highly likely to have seriously negative consequences for Pakistan's economic stability -- both in the short and long term. For one, its rapidly increasing debt burden means that the government is left with little money for development expenditure after debt repayments. This lack of money makes it difficult for the government to invest in the development of human resources and also keep in check the prices of essential economic inputs, such as electricity. These inabilities have led to several economic challenges, including slowed growth, high inflation, and increased budget deficits.

To overcome these challenges, the Pakistani government and Chinese power companies have signed agreements to reprofile Pakistan's energy debts – essentially increasing their repayment tenure by five years – and to put a moratorium on debt repayments worth over 16 billion US dollars for three years. On the flip side, these renegotiations have lowered the interest and confidence of Chinese investors in Pakistan's energy sector. They believe that the Pakistani government does not respect its agreements with the Chinese companies and also cannot pay back its loans as it promises.

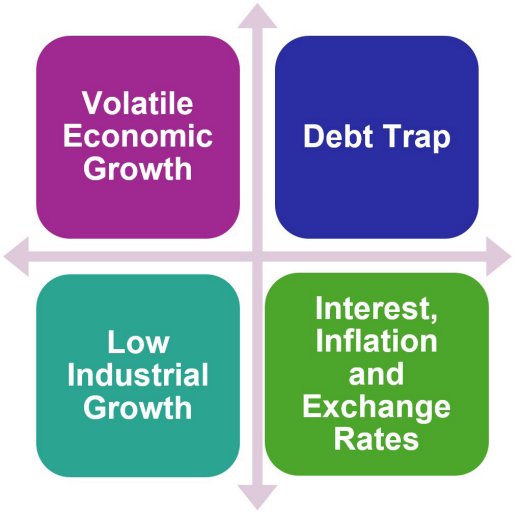

Figure 4: Macroeconomic landscape of Pakistan

Some other factors too might hinder further Chinese investments in the energy sector. These include:

Availability of foreign exchange: The uncertainty surrounding foreign exchange availability and difficulties in conversion of Pak rupees to dollar leads to inefficiencies in financial planning and budgeting for the power sector. This uncertainty also disrupts cash flow management of power projects, making it challenging to meet operational expenses and debt obligations.

Foreign exchange transactions: Chinese investors encounter difficulties in managing foreign exchange transactions in Pakistan because of regulatory restrictions which impede the efficient movement of capital in and out of the country.

Stringent taxation policies: Corporate taxes, too, poses a significant financial challenge to Chinese investors operating in Pakistan. Complex tax regulations, high tax rates, and inconsistent enforcement contribute to increased financial burdens and operational uncertainties for the power projects. Uncertainty regarding tax liabilities further deters investment and undermines investor confidence.

Limited local investment opportunities: Chinese investors in Pakistan face challenges due to the limited availability of local investment opportunities. Despite the potential for collaboration and joint ventures, the scarcity of viable local partners hampers investment initiatives. This limitation restricts the diversification of investment portfolios and increases reliance on external resources, impacting long-term investment.

Addressing these interconnected challenges requires comprehensive reforms which include improving energy efficiency, diversifying national economy, reducing debt and ensuring transparency about and sustainability of CPEC projects. On its part, the International Monetary Fund (IMF) has highlighted the importance of strategic financial planning for Pakistan's energy and infrastructure projects under the China-Pakistan Economic Corridor (CPEC). Its suggestions include the renegotiation of power purchase agreements (PPAs) between Pakistan and Chinese companies as a pathway for the financial sustainability of investments made under CPEC. This suggestion, on the one hand, is simplistic and, on the other hand, it could be counterproductive because voluntary or involuntary renegotiations might erode the confidence of future foreign investors in Pakistan's ability to abide by its investment contracts.

1.5. Environmental challenges

The majority of the projects implemented under CPEC are focused on the energy sector and, therefore, are accompanied by significant environmental costs[25]. One of the primary concerns is the emission of climate change causing carbon dioxide from coal-fired power plants as well as other energy focused projects. Transport infrastructure projects, on the other hand, have led to deforestation, with over 54,000 trees having been cut down for building roads. This deforestation not only increases the level of carbon dioxide in the atmosphere but also disrupts local ecosystems[26].
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Another major issue is the increase in vehicle traffic on all the roads built under CPEC, particularly the motorway, that links Khyber Pakhtunkhwa's mountainous and forest-covered Hazara region with the rest of the country, and Karakoram Highway, that passes through some of the most climatically vulnerable regions in Pakistan's northern region. For instance, up to 7,000 trucks will be using the Karakoram Highway every day, releasing an estimated 36.5 million tons of carbon dioxide annually.

Deforestation, human habitat loss, and biodiversity challenges are also quite significant in the areas selected for project implementation – such as the desert region of Thar which needs to be protected for its unique ecology. These environmental impacts highlight the need for sustainable development practices to mitigate the adverse effects of CPEC projects[27]. Continued collaboration between Pakistan and China is, therefore, essential to balance economic growth with environmental protection[28].

The environmental suitability of CPEC's energy projects has also remained under debate because 80.3 percent of electricity generation capacity of these projects will come from coal. This high reliance on coal has several socio-economic costs associated with it. These costs could worsen further if the Pakistani government goes ahead with its plans to shift at least three more power plants from imported to local.

Another focus area under CPEC is the development of hydropower projects which cause several negative social and environmental impacts including significant disruptions in local ecosystems, altering of river flow patterns, impacts on aquatic life, large scale human displacement and the destruction of habitats for fauna and flora. These hydropower projects also impact communities that rely on the river ecosystems for their livelihoods.

Since all the social and environmental impacts related to CPEC's energy projects, they run counter to Pakistan's commitments to neutralize its carbon footprint by 2050. Known as net-zero, this target can be achieved only if Pakistan reduces its carbon emissions, transitions to renewable energy and offsets its remaining carbon emissions by preserving and strengthening its natural resources.

China might have a few things to teach to Pakistan in this field since it has already embarked on a large-scale energy transition of its own. In 2023 alone, China installed 1,453 gigawatts of renewable energy.

25 *https://www.csis.org/analysis/china-pakistan-economic-corridor-five?form=MG0AV3*

26 *https://link.springer.com/article/10.1007/s11356-019-07428-5?form=MG0AV3*

27 *https://www.emerald.com/insight/content/doi/10.1108/IJDI-08-2021-0154/full/html?form=MG0AV3*

28 *https://pakobserver.net/green-cpec-and-sustainable-development-in-pakistan/?form=MG0AV3*

1.6. Political and security-related challenges

Pakistani leaders usually hail CPEC as a 'game changer' for Pakistan's economy but many in the country do not agree. The critics point out that, while negotiating and signing CPEC deals with China, Pakistani authorities did not consider many local considerations. For instance, the parliament, political parties, the civil society, private businesses and the communities to host Chinese projects were neither provided the details of CPEC agreements and projects nor were they formally consulted to ascertain their views about those agreements and projects. The critics also raise serious concerns over the lack of protection for local economic interests, high returns for Chinese investors and implications for Pakistan's national finances. In Balochistan, in particular, local communities feel that the present and potential benefits of Gwadar port will not flow to them. They also complain that the port development and its associated projects have taken their land, water and fishing rights. Similarly, coal-based projects in Sindh's Tharparkar district are damaging the local environment, polluting and depleting local water resources and displacing local communities from their homes and hearths. Pakistani state's response to the voicing of these grievances is usually heavy-handed[29].

On the flip side, several CPEC projects face serious geopolitical challenges. Regions like Azad Jammu and Kashmir and Balochistan, where several Chinese energy and communications projects are at various stages of implementation are both in the cross-hairs of regional security dynamics and their fraught relations with Islamabad. Balochistan, in particular, has become too volatile for Chinese companies and their employees to work with a peace of mind even though the Pakistani government has deployed thousands of security personnel to protect them and the projects they are building.

These security concerns have been highlighted during several discussions between Pakistani and Chinese leaders at various forums[30]. In a recent public outburst of his frustration over violence against the Chinese working in Pakistan, China's ambassador in Islamabad stated categorically that "Security is the biggest concern for China and a constraint to CPEC in Pakistan.[31]" To address these challenges and ensure the protection of Chinese personnel, Pakistan has formed a Special Security Division (SSD)[32] though it has not fully succeeded in its objective.

1.7. Policy and regulatory challenges

Foreign investments in Pakistan's energy sector – and not just the Chinese investment -- have faced an unfriendly environment due to constantly changing regulatory frameworks and policies. The challenges these investments face include: changing policy targets, financial instability, renegotiations of agreements and violation of key principles enunciated in policy provisions. To cite just one example, wind power projects operating in Jhimpir, Sindh, are experiencing curtailment issues even in the peak wind hours despite the fact they have 'must-run status' under the renewable energy policy. Consequently, the financial viability of many of these wind power projects is now at risk.

There is also a serious lack of coordination between national and sub-national entities, leading to non-transparent, non-inclusive and contradictory decision making. While the provincial governments have the legal and constitutional mandate to start energy projects in their jurisdiction, the federal government retains the right to set tariffs and decide whether or not – and also when and how -- to bring an energy project into the national grid. Many solar and wind power projects in Sindh and Balochistan have either been stalled or already scrapped because the federal and provincial government could not coordinate on how to handle them. This federal/provincial fracture in policy making and policy implementation is certainly not sending any positive signal to the

29 *https://www.crisisgroup.org/asia/south-asia/pakistan/297-china-pakistan-economic-corridor-opportunities-and-risks*

30 *https://www.clingendael.org/sites/default/files/pdfs/The_China_Pakistan_economic_Border_def.pdf*

31 *https://tribune.com.pk/story/2506203/chinese-envoy-miffed-at-cpec-security-lapses*

32 *https://www.researchgate.net/publication/316567368_The_China-Pakistan_Economic_Corridor_Security_Challenges*

current and prospective investors.

There is a similar lack of coordination between different ministries within the federal government. The inadequate and ineffective inter-agency and intra-agency, combined with bureaucratic inertia, and a culture of delaying every decision, impedes the resolution of crucial issues being experienced by the investors. A major manifestation of these problems can be seen in how various departments and agencies working on electric vehicles have failed to come up with a unified single policy.

1.8. Informational challenges

Both Pakistani government and private sector players do not have sufficient information about the location, financial status and performance of particular technology companies. They also often do not have necessary information about the origins, resources and areas of specialization of these companies. This lack of information means that Pakistani government and private sector players risk finding unsuitable Chinese partners for investments.

Another area where Pakistanis do not have enough understanding about Chinese financial markets and the products and services – such as bonds, carbon markets and debt-for-nature swap. We, in fact, have little information about how these markets work.

1.9. Technological challenges

Data collected and released by the Pakistan Telecommunication Authority[33] shows that Pakistanis have 165 million mobile subscriptions. Around 60 million of them own and use smartphones and 70 million of them use 3G or 4G technologies for connectivity.

These country-level numbers, however, hide many regional differences. The highest number of phone and internet users are to be found in the central regions of Pakistan – as well as in Karachi. In contrast, large areas in rural Sindh and Khyber Pakhtunkhwa provinces either remain woefully underserved or not served at all. Mobile phone connectivity and internet usage are even lower in almost the whole of Balochistan, Gilgit-Baltistan and Azad Jammu and Kashmir.

Even where the penetration of information technologies and digitization is high, it is well below global standards in general and the standards followed in China in particular. This digital divide within Pakistan – as well as the one between China and Pakistan –throws up several challenges. The greatest of these challenges involves opportunities and problems associated with digitizing energy production, transmission and distribution technologies in line with Chinese levels and standards. Another part of this challenge is to lay down digital infrastructure across all those regions where CPEC projects are located but the penetration of digital technologies there is rather low.

Bridging the digital divide, however, presents numerous opportunities for economic development and innovation. Embedding digital solutions across CPEC projects can enhance their productivity and efficiency. Integrating Pakistani projects with latest Chinese advancements and innovations will help Pakistan make a leapfrog from its current technological state to cutting edge contemporary technologies. The use of artificial intelligence, blockchain and the Internet of Things can help Pakistan identify the sources of leakages, inefficiencies and losses in the energy sector.

These changes will require large scale technology transfer – and accompanying investments -- from China to Pakistan in the information technology sector. This transfer of technology and investment, in turn, can have strong salutary impacts on Pakistan's overall economic growth and development.

33 *https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9165687/*

The following figure highlights the challenges and opportunities associated with digital integration under CPEC in Pakistan.

Challenges:

Lack of broadband internet networks and mobile phone connectivity in rural and underserved areas;

Need for investments in digital infrastructure for equitable access to high-speed internet and high connectivity mobile phones.

Opportunities:

Enhance productivity and efficieny of energy production, transmission and distribution processes by embedding digital solutions in them;

Plugging leaks and losses in the energy sector by using artificial intelligence, blockchain process and other latest digital innocations.

Potential Impacts:

Providing a foundation for Chinese investments in Pakistan's information technology sector

Boosting economic growth across all the sectors associated with energy.

Figure 5: Technology Integration in CPEC

Roadmap for the future

To address the challenges highlighted above, and tap into potential opportunities, Pakistan needs to provide Chinese authorities and investors with an enabling regulatory environment, stable policy framework, secure and safe working conditions, sufficient (but not over the top) incentives for investment and sustainable return on investment. On the flip side, China can push for transforming all its investments in Pakistan's energy sector in accord with its stated goals of greening CPEC and BRI and can also provide the means to do so.

Given these challenges and opportunities, this paper focuses on the key reform priorities which can be tapped to ensure long-term economic and environmental sustainability of CPEC. These priorities include:

1. **Ensuring regulatory and policy consistency**
2. **Leveraging Chinese private sector investments in renewable energy**
3. **Gradual transition from fossil fuels**
4. **Financing mechanisms for low-carbon development**
5. **Localization of renewable energy supply chain**
6. **Capacity building programs**
7. **Improving Pakistan's energy access through Pak-China collaborations**
8. **Modern, smart and expanded grid for energy transition**
9. **Green diplomacy and effective communications**

In the following subsections, this paper will take up each of these reform priorities in some detail.

2.1. Ensuring regulatory and policy consistency

Building the confidence of Chinese investors is the key driver for rapid integration and promotion of renewable energy in Pakistan. This will not just allow Pakistan to address its economic challenges in the power sector, it will also enable China to have a green technological, economic and environmental footprint in Pakistan.

To bring consistency in the regulatory and policy support for renewable energy

- The ministry of energy's power division should develop a comprehensive plan of action for renewable energy development. This plan should cover the regulatory framework as well as fiscal measures. It is important to involve the provincial governments in the consultation process to ensure a collaborative approach.
- There should be consistency in the targets set for renewable energy in different policies and planning documents. The targets set under the Alternate and Renewable Energy Policy 2019 must be the same as those given in the Indicative Generation Capacity Expansion Plan (IGCEP) and Pakistan's Nationally Determined Contributions (NDCs). Any plans to add renewable energy capacity should be formed and implemented under a uniform policy and regulatory framework – without creating any exceptions and without providing any project-specific exemptions and incentives.

- Pakistan's ministry of planning, development & special initiatives, and its ministry of commerce, and the government of People's Republic of China and the National Development and Reform Commission China (NDRC) should work to restructure the CPEC debt and should develop ways and means to swap this debt for green energy projects.
- The Pakistani government should establish direct and open lines of communication, particularly with Chinese project developers to ensure consistency in policy implementation and enforcement of agreements. Through these lines of communication, they should be able to discuss with the highest and most relevant government officials such matters as law and order problems, infrastructure bottlenecks, evacuation and transmission of power, timely payments, hurdles in monetary and financial transactions and any other administrative and legal obstacles.
- Pakistani authorities should also develop a clear and concise policy framework that is based on global best practices, ensures integrated policy formulation, planning and implementation. This framework should also be protected from quick and frequent changes through legislation to enable investors to make informed decisions, identify risk metrics from the outset and enhance their confidence in the Pakistani government. It should also ensure that all policies, plans, projects and agreements developed and implemented under it remain consistent over time so that investors can plan and make their investments without worries about unexpected cost escalations and other sudden and unplanned expenses.

Figure 6: Key strategies for regulatory and policy consistency to support RE

2.2. Leveraging Chinese private sector investments in renewable energy

The Chinese private sector will play a key role in CPEC 2.0 because it is focused primarily on B-2-B partnerships. Pakistani government and private sector businessmen, therefore, should be able to leverage private Chinese investments. This leveraging will require them to;

- Capitalize on the Chinese announcement about the greening of Belt and Road Initiative (BRI) to attract private Chinese investment in renewable energy. Two important Chinese documents -- Guidelines for Ecological Environmental Protection of Foreign Investment Cooperation and Construction Projects, issued in January 2022 by China's ministry of environment and ecology and ministry of commerce, and Green Finance Guidelines for the Banking and Insurance Industry, issued by China Banking and Insurance Regulatory Commission in June 2022 – can be very useful for Pakistani authorities and Pakistani businesses to pitch renewable energy projects to Chinese investors.
- Collaborate with Chinese authorities and Chinese businesses to develop a renewable energy deployment plan to identify and explore clear technical and financial avenues for scaling up renewable energy projects.
- Develop grid infrastructure and introduce smart grid technologies to increase the transmission capacity of the national grid so that renewable energy projects have guaranteed means to evacuate and transmit the electricity they produce.
- Develop a comprehensive, long-term policy for climate adaptation and climate mitigation.

Figure 7: Leveraging Chinese private sector investments and infrastructure development under

CPEC 2.0

- Enable public private partnerships for establishing renewable energy parks in Pakistan, especially addressing land acquisition issues in a just and equitable manner that ensures that landowners get market-based compensation for the lands acquired from them or alternative lands of the same quality and market value.

- Develop trade policies that support the import of renewable energy technologies and materials and promote export opportunities for locally produced renewable energy components.
- Give a seat on the table to private Chinese investors to ensure timely and effective dispute resolution.
- Develop integrated plans for energy generation, transmission and distribution as well as for larger resource management to ensure a comprehensive needs assessment and efficient, affordable and sustainable resource allocation.
- Devise a mechanism to ensure that economic growth driven by CPEC is environmentally sustainable, politically inclusive and socio-economically fair, just and equitable. This mechanism should especially focus on rural electrification through community-driven mini-grids and microgrids to make energy accessible to all segments of society.

2.3. Gradual transition from fossil fuels

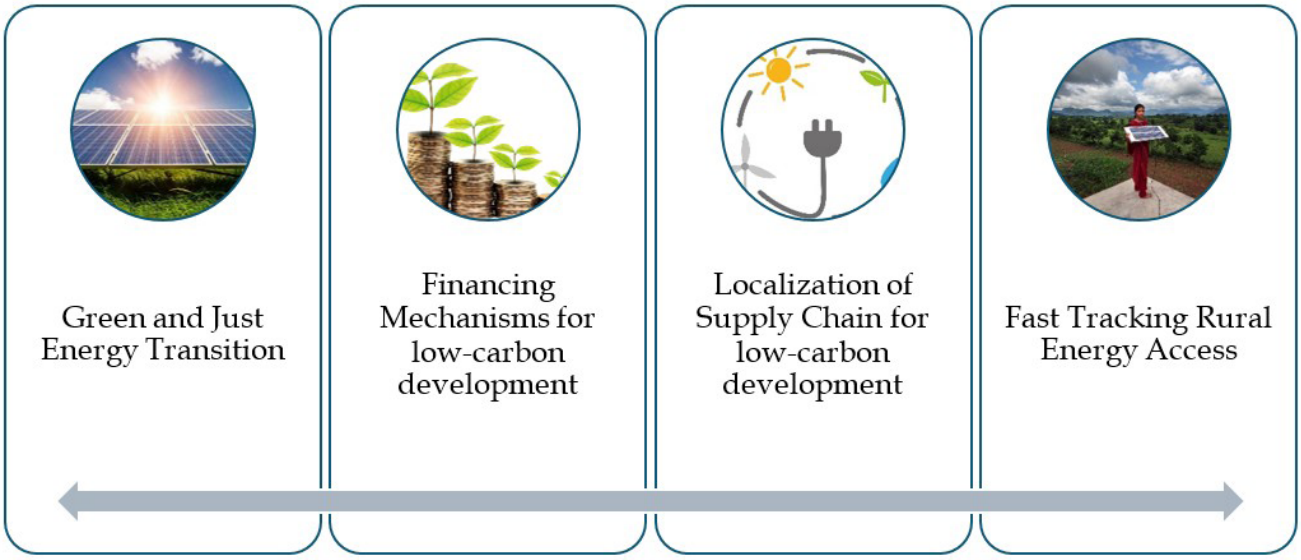

Figure 8: Key priority reforms areas

Enabling an effective energy transition under CPEC requires a pathway for a simultaneous reduction of carbon emissions from the existing coal-fired power plants and expansion in renewable energy sources. China certainly has the wherewithal to facilitate Pakistan's energy transition because its own installed renewable energy capacity exceeds 510 gigawatts[34]. It also has more than 20 million electric vehicles (EVs) on its road. This year (2024), in fact, its EV sales surpassed its sale of traditional cars.

China also has the world's largest carbon market and continues to expand its carbon reduction policies, highlighting that it has developed a strong base for promoting and expediting green economic development.

Given China's twin abilities mentioned above, following measures should be taken for transitioning CPEC away from fossil fuels:

- Initiating negotiations with Chinese financial institutions -- such as EXIM bank, China Development Bank and large state-owned investment companies – to initiate a short-term pathway for transition

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from fossil fuels to renewable energy. These institutions can help Pakistan identify mutually beneficial areas of cooperation.

- Developing detailed analysis and conducting scoping studies for a just energy transition through alternative financing mechanisms such as Energy Transition Mechanism (ETM), Just Energy Transition Partnerships (JETPs), Accelerating Coal Transition (ACT), Glasgow Alliance for Net Zero (GFANZ) and other international climate funds and partnerships that can support early retirement of coal or mobilize financing for renewable energy under CPEC.
- Developing medium term and long-term energy transition plans with help from Chinese financial institutions. These plans could include both the retirement of power plants running on fossil fuels, particularly coal, and their repurposing or conversion to renewable energy generation facilities. Following instruments can be used to operationalize this transition:

  i) refinancing existing loans through cheaper loans.

  ii) finding managed transition vehicles (MTV) that finance coal buy-outs to replace them with renewable energy projects. For instance, the Coal to Clean Credit Initiative (CCCI) initiative can be used to accelerate a managed phase-out of coal-based power plants and incentivize their full or partial replacement with renewable energy.

- Developing mechanisms that also have China's support to mitigate the financial risks involving coal-fired power plants which are facing several financial problems such as delayed payments for the electricity they produce and restrictions on their foreign transactions in foreign currencies. These mechanisms can ensure that coal-fired power plants owned and operated by Chinese companies are able to pay back to their investors and lenders earlier than their original loan repayment deadlines – at a discounted rate. This proactive measure will give the plant owners and operators the opportunity to recalibrate their financial portfolios, aligning them with Pakistan's and China's broader policy and strategic objectives focused on the induction and promotion of renewable energy.
- Designing a carbon pricing mechanism to measure the implicit/hidden social and environmental costs of coal-based power generation. After these costs are authentically measured, these can be realized either through a carbon tax or emissions trading with the objective of removing concealed incentives given to coal developers that allow them to pollute and contaminate natural resources without having to pay for them.

2.4. Financing mechanisms for low-carbon development

China's movement towards the greening of its overseas investments is manifested by its President Xi Jinping's pledge that China will build no new coal-based power plant both in China and abroad. Meanwhile, China has also made significant strides in developing green financial instruments, policies and institutions to support environmentally sustainable energy projects. One example of this is its collaboration with Indonesia for low-carbon development. Under this collaboration, Indonesia is supplying green electricity to Singapore with China's facilitation.

Similar approaches need to be adopted for the greening of investments under CPEC. These could take following shapes and forms:

- Green credits, green development funds, debt swaps and green bond markets -- to speed up investment in a sustainable infrastructure for renewable energy.

- A toolkit – similar to the one developed by the Private Financing Advisory Network (PFAN -- for financing institutions to facilitate the implementation and enforcement of the Environmental Social Management System (ESMS) for medium and high-risk projects. This toolkit includes multiple phases, ranging from project screening and evaluation to its decommissioning, obligating the developers of coal-based power plants to report back to the financial institutions after every six months about the mitigation measures being taken.
- The Traffic Light System devised in October 2021 by the Belt and Road Initiative International Green Development Coalition (BRIGC), a collective of think-tanks, Chinese government agencies and civil society organizations to evaluate all projects for their environmental risks. This system reviews projects in the light of their contributions in the three environmental dimensions of pollution, climate and biodiversity. It distinguishes between
- green projects that contribute positively to at least one environmental dimension and do no significant harm on any environmental dimension;
- yellow projects that have neither significant positive nor negative environmental contributions or risks;
- red projects that contribute negatively to at least one environmental dimension (no matter whether the project also contributes positively in another dimension. For example, this effectively puts "clean coal" on the red project list due to the negative climate impacts).
- A supporting and secure environment to be provided by regulatory bodies so that financing institutions and project developers can devise and implement incentives, standards, rules and guidelines for green investments under CPEC.
- A grievance redress mechanism in local language that is accessible to the people who are negatively impacted by power projects in various phases. Consultations should be done with local stakeholders and affected communities to ensure transparency, inclusion and accountability in project planning, development and reviews. This mechanism should be backed by a legislative framework and enforcement mechanism.
- Including international, bilateral and national covenants about environmental and social risks of energy projects in the agreements between financial institutions, project developers, project owners and host governments. These agreements should allow financial institutions to work with project developers and project owners to rectify/mitigate the environmental and social risks caused by the project.
- Incentivizing financial institutions to disclose their environmental, social and governance (ESG) targets and guidelines for lending and investing so that regulatory authorities can ensure transparency and accountability in financial transactions.
- Development of a carbon market via Clean Development Mechanism (which allows developing countries to earn certified emission reduction credits through emission-reduction projects). The funds that thus materialize should be channeled into green infrastructure and environmental, social and governance (ESG) projects focused on the development of affected communities. There are a wide variety of ESG metrics that can be applied to Pakistan -- from carbon emissions and water usage to community involvement and workplace safety.
- Collaboration between the State Bank of Pakistan (SBP) and People's Bank of China over the latter's carbon emission reduction facility (CERF) which is a structural monetary policy instrument aimed at mobilizing more social capital to promote carbon reduction and support the development of clean energy, energy conservation, environmental protection, carbon reduction technology

and other relevant key areas in a steady and direct manner. Under this facility, the People's Bank of China provides low-cost funds to financial institutions and guides the financial institutions to extend carbon reduction loans at rates.

2.5. Localization of renewable energy supply chain

As has been mentioned above, CPEC's first phase was primarily focused on infrastructure development. CPEC 2.0, on the other hand, focuses on making Pakistan a 'Hub of innovation' aimed at enhancing the impact of CPEC in Pakistan's neighboring countries. This shift acknowledges the evolving economic and development needs of the region and positions CPEC to address them effectively.

To achieve this objective, CPEC 2.0 will be primarily driven by Special Economic Zones (SEZs) to be set up at several different locations in Pakistan. Pakistan and China need to take certain steps to ensure that these SEZs become the engines of green development. To do so

- Pakistan's ministry of energy, Board of Investment (BOI), ministry of industries and production and China's National Development and Reform Commission and Chinese ministry of commerce should facilitate the relocation of green Chinese industries to Pakistan, especially the ones that work on the manufacturing of solar panels, wind turbines, batteries, and electric vehicles.
- The two sides should explore financial instruments such as green bonds, venture capital funds, and low-interest loans specifically targeted at renewable energy and EV projects within the SEZs. This facilitates access to capital for businesses operating in these sectors.
- Pakistan should expedite investments in infrastructure for SEZs to mobilize. These investments should upgrade transportation networks and ensure reliable access to electricity, water and other essential amenities.
- China and Pakistan should create such bilateral forums that provide opportunities to Pakistani and Chinese investors to interact and explore business opportunities in SEZs.

2.6. Capacity building programs

- China and Pakistan should initiate and promote joint research programs (mainly under the China Study Centers set up in various parts of Pakistan) for research and development focused on innovations in renewable energy and electric vehicles sectors. The two sides should also establish partnerships between universities, research institutions and private companies to foster innovation.
- A capacity-building program should be introduced to increase the skills of Pakistan's labor force in advanced manufacturing, digital technologies and renewable energy. Pakistan's ministry of energy, National Vocational and Technical Training Commission (NAVTTC) and ministry of Federal education and professional training should work in collaboration with China's ministry of human resources and social security, ministry of industry and information technology and National Development and Reform Commission to ensure a smooth execution of this program.

2.7. Improving access to energy in Pakistan through Pak-China collaborations

Pakistan's energy sector is marred by many anomalies. Its generation capacity exceeds its peak demand by more than 20,000 megawatts and yet many parts of the country face regular power cults. And while it struggles to increase its electricity demand, especially in winters, many of its regions, especially the rural and remote ones remain unelectrified. The most economically viable way to electrify these areas is to move away from a centralized power system to a decentralized one through an extensive use of community-run mini and micro grids. To develop this decentralized system, Pakistan's ministry of energy, ministry of planning, development and special initiatives and China's National Development and Reform Commission and other relevant Chinese authorities should develop and deploy off-grid and mini-grid renewable energy solutions under CPEC. This can be achieved by leveraging the latest renewable energy technologies, such as solar, wind, and biomass, to create sustainable and self-sufficient energy systems for rural areas.

2.8. Modern, smart and expanded grid for energy transition

Pakistan needs to adopt smart grids and work on the modernization of its existing grids in order to overcome the shortcomings of its electricity transmission and distribution system and, thereby, make electricity equitably accessible across the country. To achieve this objective,

- Pakistan's ministry of energy and China's ministry of commerce should facilitate investments to develop public-private partnerships for upgrading Pakistan's national grid.
- Pakistan's ministry of energy and the National Electric Power Regulatory Authority (NEPRA) should come up with attractive tariffs to incentivize Chinese investors for modernizing Pakistan's old and rickety grid.

2.9. Green diplomacy

- Pakistan's ministry of foreign affairs and China's ministry of foreign affairs should collaboratively design a holistic approach for green diplomacy that integrates geopolitical strategies with geo-economic objectives to promote sustainable development under CPEC.
- Pakistan's ministry of climate change and China's ministry of ecology and environment should design and conduct joint public awareness campaigns to educate the public in both countries about the importance of environmental sustainability and green practices under CPEC.
- Pakistan's ministry of planning, development and special initiatives and China's National Development and Reform Commission should encourage community involvement in green initiatives through incentives and public-private partnerships within the CPEC framework.
- The two countries should develop joint metrics and indicators to monitor and evaluate the progress of green diplomacy after a certain interval of time. This will help them assess the effectiveness of their joint initiatives.

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