

# CPEEC

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**A Renewable  
Renaissance  
for the  
Energy  
Portfolio**

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## A Renewable Renaissance for the Energy Portfolio

The journey of friendship between Pakistan and China is a remarkable odyssey that began over seven decades ago, rooted in the principles of diplomacy and cooperation. This enduring partnership, which found formal diplomatic ties in 1950, has flourished over time. With the China-Pakistan Economic Corridor (CPEC); one of the most significant infrastructure projects of the 21st century, as its centerpiece, this friendship has translated into concrete achievements. CPEC has paved way for the development of modern transportation networks, energy projects, and industrial zones, significantly bolstering Pakistan's economic prospects. Moreover, the two nations have supported each other on the global stage, whether it's through China's backing of Pakistan on various international forums or Pakistan's unwavering support for China's initiatives like the Belt and Road Initiative (BRI). As we celebrate the 10th anniversary of China's BRI, a defining foreign policy strategy of the Xi Jinping era, we envision a visible opportunity for China to solidify its global influence in the most pressing challenge of the 21st century - Climate Change. As more than 150 countries across the globe have joined the BRI through MOUs and investment partnerships, the BRI has the capacity to not only boost national economies and global GDP, it also has the potential to address and mitigate one of the biggest existential threats faced by planet earth.

### Revisiting the CPEC Journey

Designed jointly by both countries, the strategic foundation of CPEC spans across three methodically planned phases, with each phase bearing its distinct blueprint and objectives.

In the inaugural phase (2014-2020), efforts were channeled towards addressing foundational impediments, particularly within the realms of energy and infrastructure. This era saw the development of pivotal road networks, an enhanced ICT framework, and the addition of substantial power generation capabilities. A notable symbol is the establishment of the Gwadar zone into a potential economic powerhouse. Investments, especially in Pakistan's energy sector, have also been noteworthy. A whopping USD 14.5 billion was directed towards various power generation projects with a combined potential of 8220 MW. China's sponsorship in almost all of Pakistan's coal power projects has increased the coal-based energy capacity from 0.15 GW in 2015 to 7.2 GW by March 2023, accounting for 80.3% of the total capacity under the CPEC portfolio.



As of 2023, the ongoing second phase of CPEC promises a diversified vision, with objectives spanning several sectors. This phase underscores the importance of amplifying trade, bolstering industrial connectivity to global value chains, socio-economic progression, and the continued evolution of Gwadar. Furthermore, a renewed focus is on regional collaboration, agricultural modernization, and an increase in industrialization. China's 2021 resolution to halt overseas coal plant projects, coupled with its emphasis on renewable energy investments, paints a hopeful picture for Pakistan. This commitment, especially within the framework of BRI, suggests a potential green turn for CPEC's future endeavors.

China's influence in the future of Pakistan's energy sector remains pivotal as the latter embarks on a monumental energy transition. Pakistan envisions augmenting its solar and wind contribution to 30% of its total generation capacity by 2030. With a projected cumulative investment of USD 52 billion until

2030, as outlined in its planning document – Indicative Generation Capacity Expansion Plan (IGCEP), China’s role as a principal financier of power generation projects becomes indispensable for achieving these milestones.

Further emphasizing the scale of the transition, Pakistan updated its Nationally Determined Contributions (NDCs) in 2021, indicating a sweeping investment requirement of USD 101 billion for energy transformation. The BRI, with its clean energy projects, will be paramount in securing the investments needed to realize these NDCs. As Pakistan gears up to announce its Net Zero targets and strategies, the push for a greener BRI becomes ever more essential for achieving the ambitious goals outlined in the country’s Net Zero plans.

## **Pakistan’s Vulnerability to Climate Change**

Pakistan’s ongoing climate crisis is marked by a convergence of formidable challenges. With a population exceeding 220 million and a predominantly agrarian economy, the agricultural sector contributes nearly 24% to the GDP and employs about 40% of the workforce. However, a worrisome 30% reduction in river flow over the past five decades, coupled with inefficient water management practices, has plunged the nation into a precarious water scarcity situation. Additionally, the accelerating glacial melt in the northern regions, leading to an annual loss of roughly 1.5% of freshwater reserves, exacerbates this predicament. Concurrently, Pakistan grapples with recurring floods affecting approximately 5 million people annually, while an increasing frequency of heatwaves inflicts a staggering economic toll, estimated at 1.6% of GDP, stemming from healthcare expenditures, agricultural losses, and energy-related costs. These multifaceted challenges underscore the immediate imperative for comprehensive climate action and adaptation strategies in Pakistan. In fact, Pakistan ranks 5<sup>th</sup> amongst nations most vulnerable to climate change, and as per Climate Risk Country Profile of World Bank and ADB, a rise in the occurrence of flooding, potentially affecting more than 5 million people through river floodings by 2044, and an annual increase of 1 million people exposed to coastal flooding is predicted by the end of the century.

Both China and Pakistan are signatories of the Paris Agreement, committing to voluntary greenhouse gas (GHG) emissions reduction targets. It is incumbent upon the shared responsibility principle within the Paris Agreement that no new coal projects be incorporated into the flagship Belt and Road Initiative (BRI). The new coal projects expected to come online are not short-term investments but would rather span 25 to 30 years for fossil fuel-based power generation. Given the global shift away from coal and thermal power, new projects slated to come online in the coming years are anticipated to extend beyond 2050, posing a challenge to the clean development image envisioned by the BRI in the long run.

Pakistan has been a staunch advocate for the recognition of Loss and Damage (L&D) as a paramount issue in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations. The nation has underscored its susceptibility to climate-induced disasters, including floods, droughts, and glacial melt, which have inflicted profound socio-economic consequences.

## **A Shifting of the Winds – Locally and Globally:**

During a United Nations gathering in September 2021, President Xi Jinping declared China’s intention to enhance assistance to fellow developing nations in advancing green and low-carbon energy solutions, while emphasizing China’s commitment to refrain from establishing new coal-fired power plants on foreign soil. Subsequently, as per the China Overseas Finance Inventory, there have been no documented instances of new investments in coal-based power plants under the BRI.

According to the Global Energy Monitor (GEM), China is on track to double its national renewable energy capacity and generate 1,200 gigawatts of wind and solar power by 2025, surpassing its 2030 target by five years. While China has accelerated its domestic renewable energy efforts, there is a pressing need for a similar pace to be set in other BRI countries. Chinese companies are poised to play a pivotal role in expediting the energy transition across the BRI nations. It is no different for Pakistan, where Goldwind has slowly and assuredly enhanced its percentage share in Pakistan’s wind turbine market. Solar companies are also highly dependent on Chinese solar panels as well as Chinese developers, for both utility-scale and on-grid solutions. Longi, Jinko, Canadian, JA, SunTech, and Trina Solar have captured more than 95% of the local solar market, while Chinese turbine manufacturers Goldwind and MinYang have installed 311 wind turbines in the country with 526.5 MW by end of 2022.

Chinese companies are in fact the most prominent investors in Pakistan's renewable energy projects, where, as per Pakistan-China Joint Chamber of Commerce and Industry (PCJCCI), Chinese capital contributes nearly 87% of the total foreign investment in solar PV plants.

In fact, a perceptible shift toward sustainability is already underway. The most recent assessment by the Green Finance Development Center (GFDC) at Fudan University indicates that China's energy-related "engagement" – encompassing construction and investment – under the BRI during the first half of 2023 has been the most environmentally conscious for any six-month period since the initiative's inception in 2013.

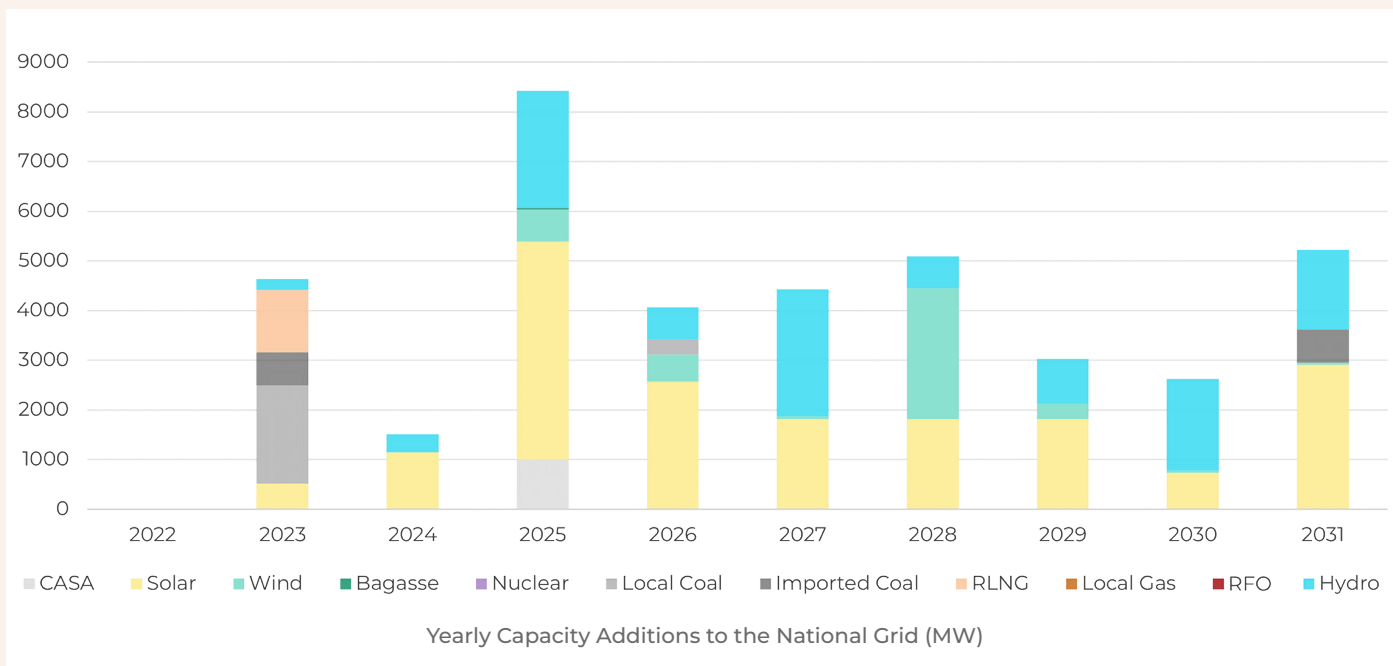
## **The Green Bridge: Renewables as CPEC's Revitalization Catalyst**

Amidst a myriad of challenges and a multifaceted crisis, Pakistan finds itself at a pivotal juncture, seeking to integrate Variable Renewable Energy (VRE) into its energy mix to address the escalating cost of electricity. Presently, with solar and wind tariffs projected at approximately 4 US cents per Kilowatt Hour, Renewable Energy stands as the most economically viable energy source in Pakistan. Its swift incorporation is imperative to alleviate the burden of electricity costs. At present, the average tariff for residential consumers hovers around 21 cents per unit, contributing to demand regression, a sluggish industrial sector, and record-high inflation over the past year. Year-on-year inflation has frequently breached the 30% threshold, while the circular debt in the power sector has reached an unprecedented USD 10 billion. Pakistan's foreign exchange reserves linger around USD 13 billion, while payables to Independent Power Producers (IPPs) have soared to over USD 5 billion, with the government struggling to settle its dues. Most of these IPPs are the coal fired power projects under CPEC. Consequently, Sinosure, the principal insurance provider for Chinese projects, has lowered its coverage from 95% to 70%. Sinosure recently communicated its dissatisfaction to the Pakistani government, highlighting the failure to meet commitments for operational projects as well.

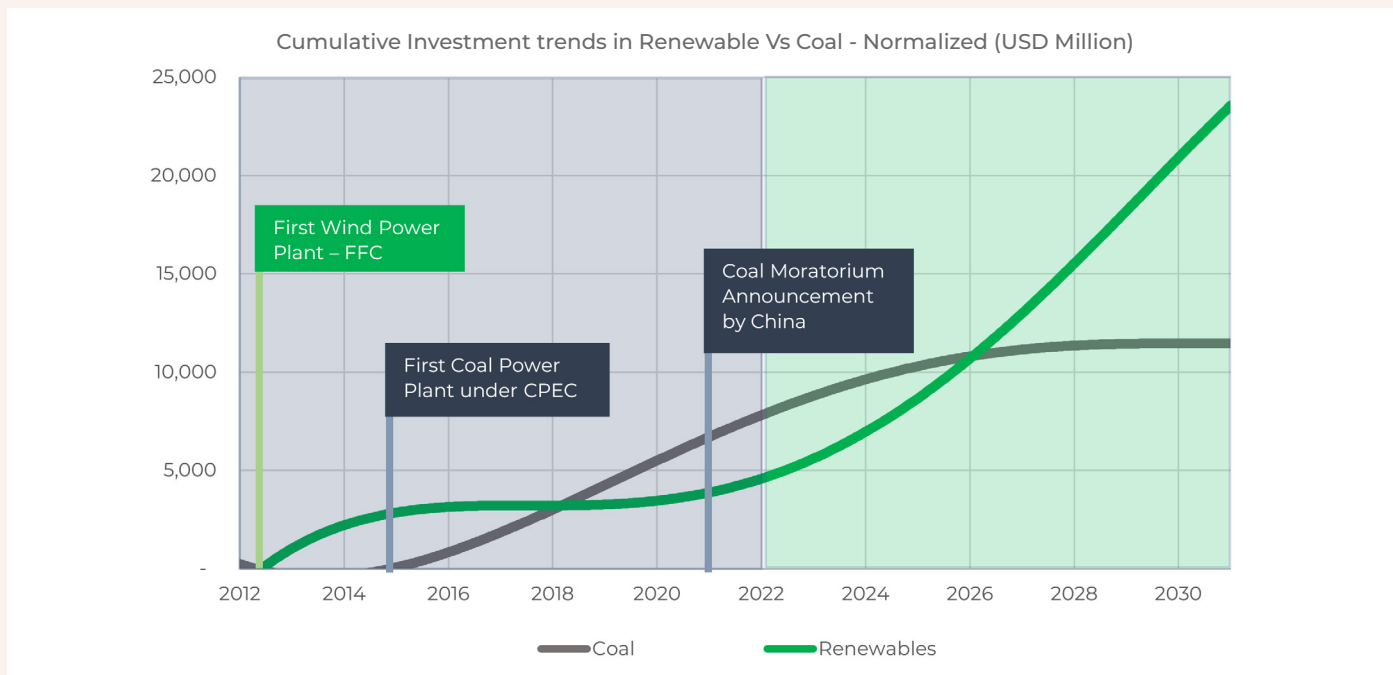
Conversely, Pakistan grapples with a surplus of power capacity amidst an economic downturn and surging international fuel prices. The challenge of capacity payments for the existing power fleet looms large, necessitating an urgent reassessment of the sector's trajectory towards sustainable development. Amid calls to halt capacity payments to IPPs to provide immediate relief to the inflation-stricken populace, existing Chinese IPPs have issued notices of payment default to the CPPA over the past year, where overdue payments to CPEC IPPs have amounted to over 1.5 billion USD. Against this backdrop, a clear departure from thermal projects toward a more sustainable future for the China-Pakistan Economic Corridor (CPEC) is imperative. Pakistan must transition from base load capacity to flexible power generation and expedite the integration of renewable capacity to reduce the overall generation cost.

While Pakistan currently relies on solar and wind for 6% of its capacity, the goal is to increase this to 20% by 2025 and 30% by 2030, in accordance with the 2019 Alternate and Renewable Energy Policy. A 10 GW solarization drive is also underway where around 6 GW of displacement for retiring and outdated thermal projects is envisioned to be added to the mix as well. Further, a dedicated drive around solarization of government buildings and properties as well as incentivizing household solar systems are also in the works, indicating a marked shift towards greater RE uptake and integration.

The IGCEP, an annual iteration of the national roadmap for all new capacity additions under a least cost model indicates that an additional total of 21 GW of wind and solar will need to be inducted by 2031 to meet the national demand in a cost-efficient manner. This necessitates an immense investment influx of around USD 52 billion. Herein lies an invaluable prospect for China, under the CPEC and BRI initiatives, to propel Pakistan's transition towards greener energy alternatives. Despite the ambitious goals set by IGCEP, Renewables First simulations indicate a pivot towards even more sustainable alternatives for a least cost model. RF simulations indicate that, Pakistan should aim to infuse its grid with 24 GW of wind and solar capacities, thereby ensuring these renewable sources constitute 35% of the national energy mix (Figure below).



China, as Pakistan’s foremost financier in the power sector, is ideally placed to supercharge this transition. The investment in coal which increased exponentially under the first 10 years of CPEC will remain somewhat stagnant in next 10 years, as shown in the figure below. The projected increase in the next 2 years is due to the already committed projects coming online. On the other hand, investment in solar and wind are set to enhance by more than 10 folds and more than 2 folds respectively in the next 10 years. China being the leader in renewable energy globally accounting for more than 30 percent of investments in solar as well as wind, will be the most critical player for Pakistan to leverage. Hence, amplifying cooperation between China and Pakistan in the green energy sector not only aligns with the country’s fiscal and infrastructural needs but also symbolizes a step forward in our collective journey towards a sustainable future.



Historically CPEC projects have been dominantly based on coal, often financed through Chinese banks. This has led to various community concerns as well as criticism around cost of externalities and environmental damage. Locals in the coal dominant Thar region have frequently demonstrated against these projects and have urged a rethink from coal to clean for the region. For a nation steeped in climate vulnerability, projects exacerbating the climate problem tend to alienate the masses against

such development. This stands in contrast to the principles of people-to-people connectivity advocated for BRI countries, demanding an urgent reassessment by both governments.

The BRI has undeniably reshaped global infrastructure development over the past decade. However, as we stand on the precipice of the next phase of this ambitious project, it's high time we reassess and recalibrate our approach. Chinese expertise and scale of RE acceleration can serve as a blueprint for Pakistan to undertake its own transition journey. Even beyond the power sector, with dwindling natural gas resources and an inability to compete in global RLNG markets, Pakistan requires an electrification drive in its transport, industrial and household sectors. These opportunities provide a massive market for Chinese investors to solidify a partnership beyond the power sector. In particular, the CPEC presents a unique opportunity to prioritize sustainability and environmental consciousness for the next ten years, both in line with the wishes of the Pakistani people as well as the global community at large.

## **Pivoting towards the GREEN CPEC:**

With increasing willingness of Chinese businesses and investors to shift towards clean energy, the next decade of this partnership needs to incorporate greater environmental safeguards and a commitment to low carbon development for the climate vulnerable nation. A Chinese led Energy Transition Facility could very well prove to be a success, where Pakistan can serve as an ideal model. The nation is struggling to pay its dues around capacity payments, with a capacity surplus in place; yet high tariffs have priced out many domestic consumers towards reduction in demand. Against this backdrop, Chinese investors would also welcome the opportunity to transition from fossil to renewables, and additional incentives for RE projects could be provided by Pakistan government in its own drive of adding RE capacity.

CPEC, often dubbed as a game-changer for Pakistan's economic landscape, has the potential to be a game-changer for the environment as well. The next decade should be defined by a commitment to green principles, fostering long-term prosperity for both nations while mitigating environmental harm.

Looking ahead, the next phase of CPEC needs to pivot towards greener and more sustainable projects particularly focused on scaling up of solar, wind and innovative clean technologies. China will be playing a critical role to establish a market of these technologies through knowledge transfer and setting up value chains. Given China's green commitments as a global leader and Pakistan's vast untapped renewable energy resources, there's immense potential for a harmonious blend of economic growth and environmental sustainability, solidifying CPEC's role as a beacon for Chinese overseas development and its positioning as a global climate leader.



RENEWABLES FIRST

Renewables First (RF) is a think tank for energy and environment. Our work addresses critical energy and natural resource issues with the aim to make energy and climate transitions just and inclusive.

Toiled in a plethora of challenges, decarbonization and energy transition remains a low priority for the World's fifth largest population in Pakistan. RF is leading energy transition coalitions, incubating organizations & networks and cooperating with existing local think tanks and civil society organizations to drive the energy transition, through collaboration and complementarity across all geographic levels.



PEOPLE OF ASIA FOR  
CLIMATE SOLUTIONS

People of Asia for Climate Solutions (PACS) aims to inspire climate hope and promote climate actions in Asia, by working with and for people, from climate victims to renewable energy technicians, from energy consumers to investors, from journalists to governments.

With the world's largest population, the fastest growing population, economy and urbanization, Asia is at a historical moment with a historical obligation to turn the climate crisis into an unprecedented opportunity for a cleaner, fairer, safer and stronger global future.

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