

Managed transition vehicle: Financing mechanism for early phase-down of Chinese-sponsored coal plants

Pilot application in the China-Pakistan Economic Corridor

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ABOUT THIS PUBLICATION

This policy brief is a publication of the Griffith Asia Institute, Griffith University, Brisbane, Australia, Green Finance & Development Center, FISF Fudan University, Shanghai, PR China, Climate Smart Ventures, Singapore and Pakistan China Institute, Islamabad, Pakistan. The brief aims to provide a vehicle for publishing preliminary results on topics related to the Belt and Road Initiative (BRI) to encourage discussion and debate. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to FISF or Fudan University, Griffith University, Climate Smart Ventures, Pakistan China Institute or to its affiliated organisations, or to members of its Board of Executive Directors. Citation and the use of material presented in this brief should consider this provisional character.

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To be cited as: Nedopil, C, Ang, L and Hyder, M, *Managed transition vehicle: Financing mechanism for early phase-down of Chinese-sponsored coal plants: Pilot application in the China-Pakistan Economic Corridor*, Griffith Asia Institute, Queensland, Australia, DOI: 10.25904/1912/5218

Cover image: Turbine at Muzaffargarh Power Station in Punjab, Pakistan. (Wikimedia Commons)

Introduction

China has supported economic, social, and green development through the Belt and Road Initiative (BRI). After 10 successful years since the BRI's initiation, a new and even greener era of the BRI can be achieved. A key opportunity will be to accelerate the green energy transformation.

A particular challenge to utilise that opportunity lies in simultaneously reducing emissions of existing coal-fired power plants (CFPPs) and expanding alternative green energy sources. New pathways and ambitions have emerged to achieve the dual goals, particularly in Pakistan as one of the key BRI countries through the China-Pakistan Economic Corridor (CPEC).

The brief addresses the global trend of financing for coal phase-down in emerging economies, Pakistan's domestic readiness, opportunities for China to support low-carbon energy transition in Pakistan through two financing mechanisms (i.e., refinancing and managed transition vehicle), and steps to be considered for China to implement and scale an accelerated energy decarbonisation in the BRI in a manner that achieves win-win situations by mitigating future financial risk for China and enhancing joint value creation and political cooperation gain across the region.

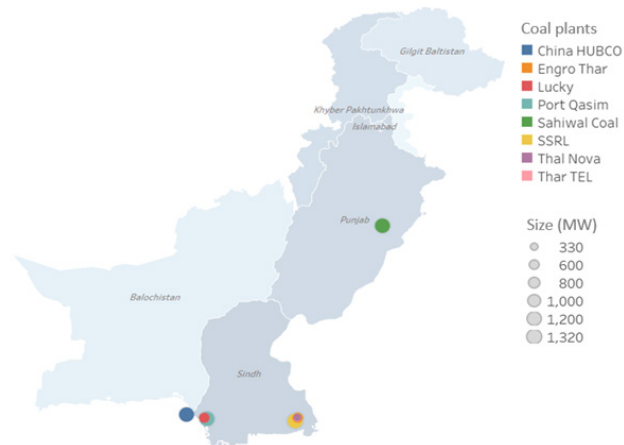
Background for China to support Pakistan's coal phase-down ambitions

Pakistan is faced with economic and sovereign debt challenges

Currently, Pakistan is facing sovereign debt distress: In 2021, Pakistan's external public and publicly guaranteed (PPG) debt stood at \$94.7 billion, about 27 per cent of Gross Domestic Product (GDP). It is primarily held by official multilateral creditors (33.8 per cent), including the World Bank (19.3 per cent) and Asian Development Bank (14.5 per cent). In addition, emerging creditor China holds 28.9 per cent of Pakistan's PPG external debt, holdings that rose from USD7.6 billion in 2016 to USD 27.4 billion by 2021, equivalent to 7.9 per cent of Pakistan's GDP. **An important driver for Pakistan's sovereign debt distress was the need to finance imports of coal used for fuel in its CFPPs.**

Pakistan's sovereign debt challenges impact the financial health of existing coal IPPs, including the ones financed by China with sovereign guarantees of the Pakistan government: Pakistan has been the key recipient of Chinese energy-related engagement, including in coal: Under the China-Pakistan Economic Corridor (CPEC), Pakistan has expanded its coal power generation from 0.15 GW in 2015¹ to more than 7.2 GW in March 2023. Currently, there are 15 coal-fired power projects in Pakistan, with 8 in operation, 2 committed, and 5 as candidates (see Figure 1). Of the eight operational plants, seven were sponsored by China.

Figure 1: Overview of operating coal plants in Pakistan by size and location



Source: Global Energy Monitor

Note: ThalNova and Thar TEL are overlapped, compiled by March 2023

In consequence of Pakistan's economic situation, **Chinese companies invested in coal projects are facing a backlog of payments with outstanding amounts at around USD 1.5 billion (by March 2023)**, resulting in serious financial problems on debt repayment and operational barriers for the Chinese-funded Independent Power Producers (IPPs). This situation, on the one hand, has led to political pressure on the Chinese government to ensure the viability and profitability of its overseas investments while also drawing international attention to its responsibility in addressing bad debt.

Pakistan's government shows readiness for coal phase-down

Pakistan's government has applied to be part of the Asian Development Bank's (ADB) energy transition mechanism (ETM) that provides pathways and potentially financing to phase-down existing coal plants. This work has been ongoing since 2022.

In addition, while Pakistan is exploring domestic sources of coal (e.g., Thar coal in Sindh province) to reduce coal imports, this **domestic coal is expected to be of lower quality or calorific content, which entails consumption of more coal to generate the same levels of electricity, additional maintenance cost and negatively impacts energy efficiency, air pollution and greenhouse gas emissions.** At the same time, the government of Sindh province has signalled its willingness to evaluate reduction of coal dependencies in exchange for alternative green investments and jobs.

Global ambitions on coal phase-down are accelerating

Pakistan's interests are aligned with global CFPP coal phase-down efforts: Across the world, ambitions and actions to accelerate green transition, including phase-down of existing coal-fired power plants, have been increasing over the past two years, often with a focus on emerging economies. Latest initiatives include:

- **Powering Past Coal Alliance (PPCA) initiated in 2017** by the UK and Canada at COP23 aims to commit to phase-down coal by 2030 in OECD countries and by 2040 globally.

- **Energy Transition Mechanism (ETM) launched in 2021** by the Asian Development Bank (ADB) as a public-private finance vehicle to expedite the retirement or repurposing of fossil fuel plants within 15 years or shorter in Asia and Pacific.
- **Just Energy Transition Partnership (JETP) was launched in 2021** at COP26 in Glasgow with a goal to expand public and private financing for equitable energy transitions of emerging economies. JETP is mainly financially supported by the international partners group (IPG) comprising France, Germany, the European Union, the United Kingdom and Canada, and private financial institutions. Four countries have joined JETP to date: South Africa in 2021, Indonesia and Vietnam in 2022, and Senegal in June 2023.
- **Accelerating Coal Transition (ACT) launched in 2021** is a comprehensive program designed to assist countries in transitioning away from coal. ACT operates as a multi-MDB financing platform under the Climate Investment Funds (CIF). The program has received substantial financial backing from the G7, who pledged up to USD 2 billion.
- **The ASEAN Taxonomy for Sustainable Finance released in March 2023** and includes coal phase out activities in the Plus Standards framework. It categorises coal phase out into "green" if the CFPPs achieve phase-out by 2040 and "amber" if the CFPPs achieve phase-out by 2050 (more details please refer to the original document).²
- **Glasgow Alliance for Net Zero (GFANZ) in June 2023** has published a guidance for managed coal phase out (MPO) in Asia-Pacific, which was developed in collaboration with local financial and policy stakeholders, as well as knowledge partners.³
- **Monetary Authority of Singapore (MAS) in 2023** evaluates the investment in blended finance instruments to provide financing for accelerated phase-down of coal fired power plants in the Asian region.

Energy transition goes beyond CFPP phase-down and includes expansion of renewable energy capacities, energy storage and grid infrastructure.

For China, these developments provide a strategic opportunity to work with BRI countries to expand support for an accelerated green energy transition. China has convincingly shown its contribution to a global green transformation by committing to stop building new coal fired power plants abroad in 2021 and by becoming the world's most important supplier of renewable energy technologies. At the same time, China holds the largest public portfolio of coal fired power plants outside of China through its state-owned banks and state-owned enterprises.

This unique situation should allow China to develop a new China-specific approach to support the accelerated green energy transition and position itself as a prime investment partner for renewable energy infrastructure in BRI countries.

Advantages for China in supporting phase-down of coal in Pakistan

As discussed above, China holds a key position to navigating the local phase-down of coal assets in Pakistan and, simultaneously, in scaling low-carbon energy deployment. China could benefit from accelerated phase-down of coal and renewable energy transition in Pakistan in five major ways:

First, China could reduce financial risks of current operations of coal-fired power plants in Pakistan by getting earlier pay out of loans (even at a discount). This would allow the operators and owners to possibly re-balance their books financially and ensure that the portfolio becomes “greener” in line with overall policy and strategic ambitions of involved enterprises. This also provides guidance to China and its SOEs on how to address Pakistan’s existing circular debt issue through this framework or other programs.

Second, Chinese enterprises could benefit through the accelerated deployment of renewable energy technologies in Pakistan necessary to meet energy needs and position it as a prime partner in the region. This would allow for e.g., higher exports and improved technological footprint in Pakistan with significant economic upsides.

Third, China could consolidate its green contributions in the BRI and beyond through active participation in coal phase-down in the region, rather than for Pakistan and others to rely on mechanisms without Chinese participation and contribution (e.g., JETP, ETM). This will also prime Chinese SOEs and investing vehicles as prime financing partners to teach and lead local banking and investing into renewable energy. This helps accelerate commercial funding available to CFPP phase-downs and limits dependence on concessional capital.

Fourth, China could learn from the Pakistan experience to scale CFPP phase-down to other interested partner countries. This would also allow China to formulate standards on accelerated CFPP phase-down according to the BRI’s needs.

Finally, China would actively contribute to the reduction of global climate risks by actively accelerating the reduction of greenhouse gas emissions and further add to its claim as a global climate mitigation leader.

Financing instruments for Pakistan coal phase-down

Several instruments have been suggested and applied to finance accelerated phase-down of coal fired power plants e.g., based on GFANZ³, Climate Policy Initiative and Climate Bonds Initiative⁴, JETP, as well as the Green Finance & Development Center at FISF Fudan University.⁵ The instruments relevant for China’s decarbonisation and phase-down opportunities include in particular:

- **refinancing** existing loans through cheaper loans with the promise to retire early, and
- **managed transition vehicles (MTV)** that finances coal buy-out and renewables

Both instruments are described below and can be combined with a **debt-for-climate or debt-for-renewable energy swap**.

Debt swap for climate and renewable energy

Debt-for-climate or debt-for-renewable energy swaps could improve sovereign debt sustainability of Pakistan. Debt swaps include a write-down of parts of a sovereign-backed loan against a commitment to sustainable development (e.g., reduction of emissions, renewable energy investment, protection of nature). Debt swaps have seen increasing application in emerging economies since 2020 with financial support of various governments (e.g., US government) and development finance institutions (e.g., Inter-American Development Bank).

As most of the loans provided by Chinese institutions for the construction and operation for Pakistan’s CFPPs are guaranteed by Pakistan’s government, the Chinese loans and outstanding debt directly add to the public and publicly guaranteed (PPG) debt burden of Pakistan.

At the same time, China’s overseas CFPPs, including those in Pakistan, are typically financed under commercial terms. However, financing is mostly provided through Chinese state-owned institutions, including its policy banks (e.g., China Development Bank, China EXIM Bank), state-owned banks (e.g., ICBC, Bank of China), and state-owned enterprises. Accordingly, swaps could be implemented with support and coordination by China’s central government support under specific conditions.

Accordingly, debt swaps have been evaluated by Chinese government stakeholders over the past year as a tool to reduce China’s overseas sovereign debt exposure, most recently by the Green Finance Committee under the People’s Bank of China⁶ and, separately, by UNDP China with the support of CAITEC under China’s Ministry of Commerce.⁷

Refinancing for accelerated green energy transition

Refinancing provides lower cost debt financing to existing coal plant operators to pay back existing debt, while the surplus through the lower interest rates allows the plant operator to shut-down the plant early minimising financial losses (see Figure 2). At the same time, a separate new investment in renewable energy and related infrastructure can ensure energy security and affordability.

Refinancing provides lower financing cost to current owners by utilising two developments. First, refinancing utilises accepted market-based instruments, such as green bonds or sustainability-linked bonds and loans that are typically provided at lower cost than regular financial instruments in China and internationally. Both sustainability linked loans and green bonds require borrowers to commit to CO₂ emissions reductions that are aligned with decarbonisation activities including expansion in renewable energy projects and coal phase-downs.

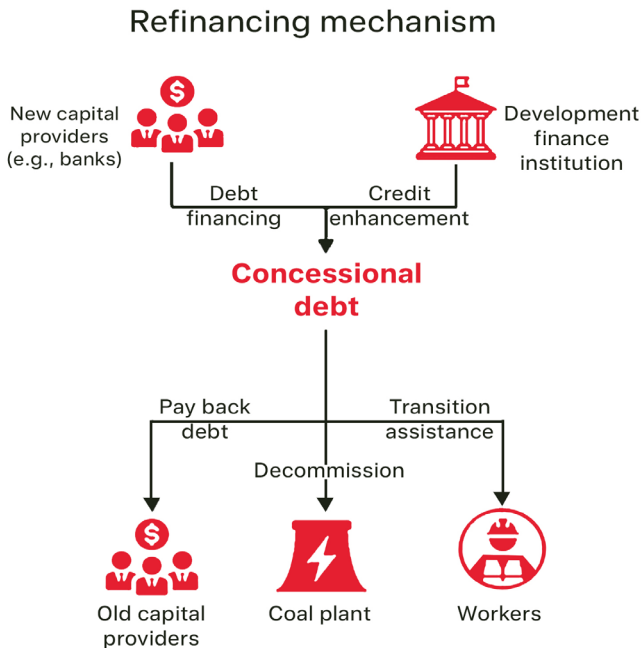
Second, a development finance institution (or other financial institutions) can provide credit enhancement to lower the overall cost of financing and increase commercial investor appetite. These credit enhancements can take various forms:

- debt reduction of existing loans, e.g., through debt swaps
- interest-free or concessional loans
- guarantee mechanisms against credit or political risks

Typically, such credit enhancement mechanisms are available against a credible and transparent commitment to a green transition target, such as early coal phase-down.

Taken together, this concessional financing instrument can reduce the cost of the debt by e.g., 1 per cent, which would mean for some Pakistan-based financing from 17 per cent to 16 per cent per year.

Figure 2: Refinancing mechanism of coal-fired power plants



Source: Authors

The concessional debt will then be used to pay back existing creditors, operate the coal plant for a limited amount of time before phasing down, and providing transition assistance to workers.

Accordingly, refinancing allows for an increase of value of the coal plant due to the reduced financing costs compared to the existing loan structure. According to new calculations, refinancing of coal plants with phase-down could already significantly increase the enterprise value after 12 years after refinancing (even without revenues from renewable alternatives) of three exemplary Chinese-sponsored plants in Pakistan, compared to operation across the full lifecycle. This result is possible due to lower cost refinancing despite the young age of several plants.

Table 1: Enterprise value through refinancing for three different Chinese-sponsored Pakistani coal-fired power plants

Plant	Business as usual	Refinance and retire
SSRL (1320 MW plant commissioned in 2023)	USD 2.19 billion	USD 2.62 billion
Engro Thar (660 MW plant commissioned in 2019)	USD 844 million	USD 944 million
Sahiwa (1320 MW plant commissioned in 2017)	USD 1.61 billion	USD 1.65 billion

Source: Climate Smart Ventures and Green Finance & Development Center

Managed transition vehicle (MTV) for accelerated green energy transition

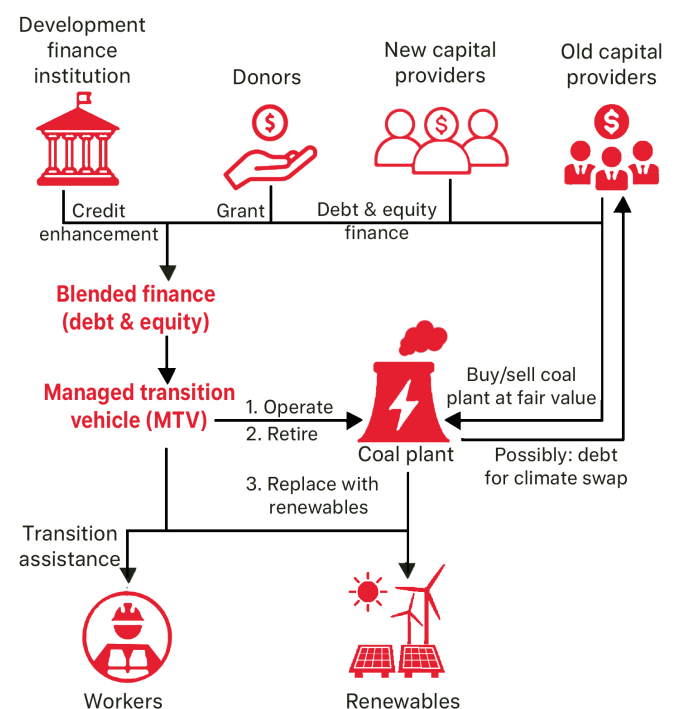
Pakistan is evaluating the application of the concept of the MTV: MTVs are preferred by multilateral development banks and other investors such as the Asian Development Bank (ADB) due to their ability to minimise exposure, ensure different sources of return, and facilitate easy implementation of safeguards. Through the evaluation of possible early CFPP retirement in Pakistan by the Energy Transition Partnerships under the ADB, MTVs are already being evaluated.

A managed transition vehicle (MTV) is a funding vehicle using blended finance to acquire/refinance CFPP assets with the goal to accelerate phase-down of the CFPP, while simultaneously providing funds to build up renewable energy capacity.⁸

Various possibilities exist to design an MTV. The following is one of the possible structures: The managed transition vehicle (MTV) is a newly established special purpose vehicle (SPV). The MTV buys the coal-fired power plant (CFPP) from the original owner(s) with the agreement to phase down the CFPP ahead of schedule, e.g., 5-10 years earlier. At the same time, the MTV agrees with the utility (in the case of Pakistan, PEPCO, a government-owned entity) to finance new renewable energy installations. The original owners of the CFPP can invest in the MTV as debtor or equity holders. The renewable energy PPA is auctioned to the most competitive provider (see Figure 3).

The MTV is financed by various investors (e.g., investors of existing CFPP, new investors). Similarly to refinancing, financing is enhanced through concessional financing and/or guarantees by development finance institutions and potentially grants by donors. This allows for lower cost financing than was possible for the previous assets due to the green nature of the MTV.

Figure 3: Managed transition vehicle (MTV) with combined coal and renewable PPA



Source: Authors

In combination with investments into renewable energy through a managed transition vehicle (MTV), the enterprise value of multiple Chinese-sponsored Pakistani CFPPs would more than double compared to the existing coal plant operations, according to new calculations (see Table 2).

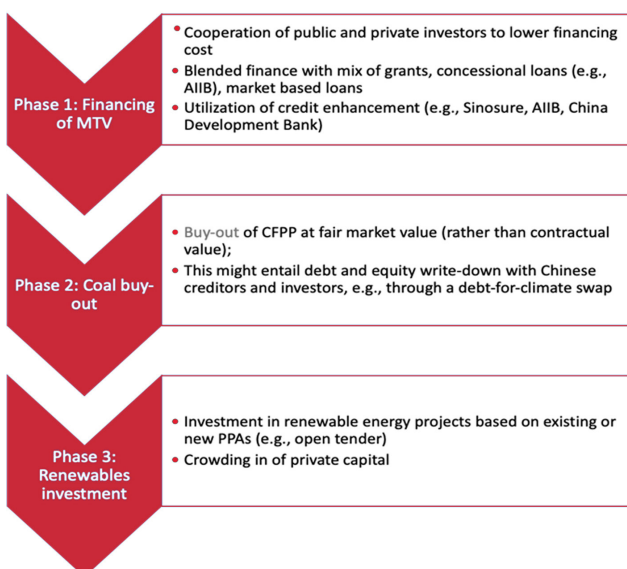
Table 2: Enterprise value through managed transition vehicles (MTV) for three different Chinese-sponsored Pakistani coal-fired power plants

Plant	Business as usual	Refinance and retire
SSRL (1320 MW plant commissioned in 2023)	USD 2.19 billion	USD 4.16 billion
Engro Thar (660 MW plant commissioned in 2019)	USD 844 million	USD 2.04 billion
Sahiwa (1320 MW plant commissioned in 2017)	USD 1.61 billion	USD 5.07 billion

Source: Climate Smart Ventures and Green Finance & Development Center

Using an MTV is the most flexible structure to date as it allows to include different funding sources across different sources. This structure maximises possibilities of concessional finance participation and utilising blended finance to achieve lowest cost of capital and longest tenors particularly for debt financing. It also limits the levels of exposure of new investors, potential dilution of existing investors, and applications of safeguards to identified assets as compared to financing an existing holding company of a power generation group or power generation portfolio. The process of structuring an MTV can be divided into three phases noted in the diagram below (see Figure 4).

Figure 4: Phases of managed transition vehicles financing



Source: Authors

The following box highlights an example of an application of the MTV concept for a Chinese sponsored coal plant in Pakistan:

EXAMPLE OF MTV APPLICATION

An MTV is established by the current owners of the coal fired power plant with a USD 200 million equity investment. The MTV raises USD 750 million from international capital markets with a sovereign risk guarantee provided by Sinasure at 10 percent over 10 years and a concessional loan from AIIB of 250 million for 2.5 percent, plus a USD 5 million grant from a philanthropic foundation.

The MTV uses USD 500 million to buy a 1 GW CFPP to be phased down in 7 years instead of in 35. The USD 500 million allows the CFPP owners to pay back 85 percent of the CFPP's outstanding debt. The remaining 15 percent could be cancelled including outstanding arrears (outstanding debt payments) in a debt-for-climate swap to reduce sovereign debt burden of Pakistan and ensure de facto payment of debt against the risk of continued payment delays and debt default.

The MTV's remaining USD 705 million are invested in about 3 GW of renewable energy parks (together with other investors) through a loan with 14 percent interest rate. The renewable energy parks have been reverse-auctioned to the lowest bidder. This structure allows the MTV's equity holders to earn sufficient returns. Alternatively, as an equity investor, the MTV would benefit according to the agreed PPA. Furthermore, if the MTV owners can operate the CFPP profitably for the remaining runtime, these profits would further increase the ROE.

Proposed action plan for China to engage in coal phase-down in Pakistan and beyond

In the case that, after evaluating the feasibility of supporting coal phase-down in Pakistan or other BRI countries, Chinese policymakers need to take some pre-requisites into consideration in order to achieve the successful coal phase-down and the accelerated green energy development. In particular, the following five conditions should be evaluated:

First, are the original investors, such as Chinese SOEs and Chinese banks, willing to sell their asset at a risk-adjusted price to the new MTV (possibly including a debt-for-climate swap). A motivation should be the current delays in the payment schedule and the consequent financial liquidity issues of the asset. Another motivation should be the possibility to improve de facto profitability through investment green energy projects, including, possibly, the construction of these projects. The willingness of Chinese investors likely depends on bilateral policy negotiations between competent ministries in Pakistan and China (e.g., Ministry of Finance).

Second, are institutions providing credit enhancement mechanisms identified and willing to support the deal?

Such institutions could include bilateral and multilateral financial institutions, such as Sinosure, and AIIB. The former is currently exposed to credit default risks of the existing CFPPs and might be interested in reducing its losses through raising new financing, possibly even from international markets. Sinosure would take a similar role as the US DFC in debt-for-nature swaps in other countries. AIIB could provide additional concessionary financing, or possibly even guarantees and other forms of credit support (depending on its available financial instruments).

Third, can international commercial investors be mobilised to provide financing for the MTV that simultaneously provides finance for phase-down of CFPPs and investment of green energy?

As seen in previous debt-for-nature swaps, significant money can be raised from international capital markets (the latest debt-for-nature swap in Ecuador raised about USD656 million from capital markets), particularly for green projects with internationally accepted guarantees and other credit support structures.

Fourth, can China and Pakistan work together (possibly with international partners) to develop electricity deployment plans?

These plans would lay out clear technical and financial avenues for scaling of green energy generation and infrastructure investments.

Finally, has the government of Pakistan signalled willingness to agree to this instrument and provide the necessary conditions?

These conditions could include the auctioning and establishment of the new renewable energy park (e.g., through a public private partnership to support land acquisition etc.). Pakistan has already emphasised a strong desire to build a green CPEC as a role model for the rest of the BRI and various institutions with government support have established the Green CPEC Alliance in 2022.

Conclusion

In reflecting on the past decade of the BRI, a key opportunity of accelerating the green energy transition in BRI partner countries lie ahead for Chinese policymakers. As one of the key BRI countries through the China-Pakistan Economic Corridor (CPEC) and a country with strong willingness to implement early coal phase-down,

Pakistan provides a great example and potential pilot country to be evaluated on China's support for its low-carbon energy transition ambitions.

Pakistan has shown strong interest in exploring the early phase-down of its existing coal plants by joining the Asian Development Bank's (ADB) Energy Transition Mechanism (ETM) aimed at accelerating the retirement or repurposing of fossil fuel power plants and replacing them with clean energy alternatives.

Pakistan's ambitions are aligned with **significantly accelerated efforts in and by developing countries to accelerate the phase-down of existing coal plants recently**, not least through the ASEAN green finance taxonomy published in March 2023 with a clear phase-down financing mechanism, and GFANZ guidance for managed phase down of coal assets in Asia shared in June 2023.

New calculations show that **committing to accelerated coal phase-down and utilising specific financing instruments** (e.g., refinancing, managed transition vehicles) can **significantly increase the enterprise value of Chinese-sponsored CFPPs in Pakistan**, by up to 190 percent.

Application of these financing instruments by China together with local and international partners **can simultaneously provide significant investments in green energies**. Such investments in green energy further increase bankability of coal phase down, improve economic stability, and provide new jobs.

A successful application of such a mechanism can be scaled to other countries currently supported by China and would further elevate China's global standard setting role for green energy transition, sovereign debt sustainability, transition finance, and sustainable development in line with national, regional, and international climate and development ambitions.

Accordingly, at this critical juncture of the world's energy transition where the costs of renewable energy are rapidly declining while demand for power continues to rise, engaging in coal phase-down would allow China to improve financial outcomes for existing Chinese coal plants owners, improve economic prospects of Pakistan, contribute to China's green BRI ambitions, and reduce global climate emissions.



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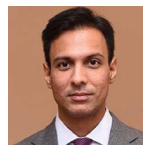
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