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The Potential for Early Coal Plant Retirement

WORKSHOP SUMMARY

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EXECUTIVE SUMMARY

Globally, there are more than 2,000 GW of coal power in operation, accounting for about 30 percent of global CO₂ emissions (IEA 2019). To meet the Paris Agreement and avoid catastrophic climate change, all coal-fired power generation should be phased out by 2040 (IEA 2021). Thus, new coal plants are not compatible with climate targets, and existing ones are increasingly facing the prospect of early retirement.

Yet, a fundamental dilemma of the 21st century is reconciling the need to decarbonize with the rising demand for energy in rapidly industrializing countries, especially in South and Southeast Asia. In these regions, coal-fired power plants tend to be younger, with a long lifetime ahead, while energy needs are still rapidly rising. Discussions on early retirement must incorporate the need for a just transition that meets local energy and economic needs.

China has played a particular role in enabling coal plant development in South and Southeast Asia. As the largest public financier of coal, China has provided development finance and foreign direct investment for 41 GW of currently operating coal plants (BU GDPC 2020). Yet, China is gradually shifting its overseas energy investment strategies to favor more renewables and can position itself as a provider of sustainable development finance.

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To explore potentials and strategies for the early retirement of coal plants, the Green Finance and Development Center at FISF Fudan University, the Center for Sustainable Finance at SOAS, University of London and the Boston University Global Development Policy Center co-hosted a workshop in March 2022. The workshop assessed the potential for early coal plant retirement, with a focus on China's role in enabling this transition overseas. The workshop featured presentations on current practices and challenges of early retirement of coal-fired power plants. The workshop also featured a panel discussion on how such early retirement mechanisms could be applied, especially for China's overseas investments.

During the closed-door workshop, experts from the financial sector, development finance institutions, academia and think tanks in over 15 countries shared current practices, strategies and challenges for early coal retirement. The workshop was convened under Chatham House rules. The workshop was supported by the UK Pact Programme.

The workshop considered questions like:

- Following Chinese leader Xi Jinping's announcement to not build new coal plants overseas in September 2021, how can China support the green transition and evaluate the potential for early coal retirement in its overseas investments in already operating plants?
- What are some promising examples of coal retirement and coal retirement mechanisms?
- What additional partnerships are needed to accelerate coal retirement?
- How can creative financial mechanisms for early retirement also accelerate the construction of more renewable energy capacity?
- How can the private sector be incentivized to participate in early coal retirement?

Key takeaways:

- While coal retirement will be necessary to meet climate targets, it is an especially challenging prospect in emerging markets where coal fleets are relatively young and competitive, and coal remains a favored source of energy.
- There are promising examples of multilateral programs to address coal phaseout and coal retirement, including the Asian Development Bank's Energy Transition Mechanism, the Climate Investment Funds' Accelerating Coal Transition Investment Program, the Just Energy Transition Partnership and the Coal Asset Transition Accelerator.
- As a key enabler of coal plants overseas, China must consider the prospect of coal retirement, as increasing climate ambition in Belt and Road Initiative countries will lead to stranding risk.
- Future research and policy development will need to incorporate consideration of a just transition for communities that rely on coal. Specific and appropriate financial mechanisms for coal retirement must be a focus of future work, as well as creating enabling policy environments in developing countries with coal plants.

The following policy brief summarizes the workshop presentations and panel discussion.

Opening Remarks

The opening remarks highlighted the success stories from bilateral cooperation between China and the United Kingdom (UK) and how the UK has facilitated the coal transition domestically and internationally. The UK was a significant coal-producing and consuming country, but has completely



redefined its energy mix over the years and was able to phase out coal in a few decades. UK government policies played a central role in implementing targets to help establish a long-term direction for the shift to renewables. The UK government also created ambitious renewable energy support schemes and heavily subsidized renewable energy capacity. As a result, the UK has cut its emissions by 40 percent since 1990 and has grown its economy by two-thirds. The UK's experience shows that the energy transition does not need to come at the expense of economic growth, but rather can be an opportunity to build a more resilient economy.

The UK is also supporting international coal phaseout efforts: One of the biggest breakthroughs in international commitments to phase down coal was adopted at the 2021 UN Climate Change Conference held in Glasgow, known as COP26. Seventy-seven countries adopted the Glasgow Climate Pact and agreed to phase out inefficient fossil fuel subsidies and phase down unabated coal power. Alongside this pact, the Energy Transition Council (ETC) was an important initiative launched at the Glasgow summit that supports dialogue between developing economies and serves as a platform to enhance technical, financial and political collaborations in the power sector. There are several other innovative programs that support green transition and coal retirement, notably the Asian Development Bank's (ADB) 'Energy Transition Mechanism' (ETM); the Climate Investment Funds' (CIF) 'Accelerating Coal Transition Investment Program' or ACT program; and a pioneering multilateral financial commitment to support the energy transition in South Africa, the 'Just Energy Transition Partnership' (JETP). Nevertheless, there is a need to establish precise mechanisms and criteria to evaluate the value-added of the intervention of public entities in climate finance.

Presentations

Global Best Practices of Early Coal Retirement and Application to China's Belt and Road Initiative

The first presentation tackled global best practices of early coal retirement and application to China's Belt and Road Initiative (BRI). This study proposed financing and policy options and drew recommendations on strengthening China's actions on retiring its overseas coal assets. The presenter highlighted different global approaches towards coal retirement with a focus on how to apply these to China's overseas coal fleets.

Progress and experiences in phasing out coal-fired power plants are quite different around the world. The presenter highlighted multilateral initiatives and domestic initiatives. Multilateral initiatives play a crucial role in supporting financial mechanisms for early coal retirement. One of the leading examples is the ADB's ETM, which has two separate funds: one for buying out the plants, and another fund for supporting renewable energy infrastructure.

Secondly, CIF's Accelerating Coal Transition (ACT) program has a detailed framework for multilevel implementation, country-level policies and a roadmap for communities to decommission coal plants.

Thirdly, the EU's Just Transition Mechanism is a comprehensive framework for elevating climate change's social and economic impacts. Thus, developing further just transition finance frameworks that encourage long-term political buy-in, increase cooperation with local operators and communities and establish precise institutional planning is critical.

Applying these lessons to China, however, is challenging. China is the largest public financier of overseas coal projects, having provided development finance for over half of recent overseas coal capacity (Ma and Gallagher 2021). However, it is important to note that most of China's overseas coal fleet (primarily based in Asian countries) is rather young, with an average age of under ten years. It



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is nevertheless encouraging that the value of China's commitments to coal plants overseas peaked from 2015 to 2016 and then declined to zero in 2021 (Nedopil 2022).

To evaluate possible acceleration of coal phase-out of Chinese-sponsored power plants, the presenter highlighted several steps, such as the need to understand the profitability and Net Present Value (NPV) of existing coal-fired power plants and the need to properly engage with countries considering retirement on the political, social and economic levels. Finally, it will be important to work with such countries to develop appropriate financial mechanisms and alternative energy scenarios to ensure energy demand is met.

Capitalizing on Coal: Evaluating Early Retirement Options for BRI Coal Plants

The second presentation looked in detail at the financial mechanisms available for early retirement of coal-fired power plants backed by Chinese entities. The presenter highlighted that China has financed over 40GW of currently operating overseas coal power plants. The China Development Bank (CDB) and Export-Import Bank of China (CHEXIM) have financed most of this capacity, and these plants are concentrated in South and Southeast Asia. Financial flows for additional new coal projects have dropped, especially in the wake of Chinese leader Xi Jinping's announcement in September 2021 that China would not build new coal plants overseas (Springer and Ma 2021). However, most of the existing fleet still have more than 20 years' intended lifetime and tend to be more financially competitive, making it difficult to wind down quickly.

To make retirement more feasible, the presenter shared several financial mechanisms for early retirement, such as debt refinancing with a lower interest rate, redirection of refinancing cash flows to convert the coal generating capacity into new clean generating capacity and encouraging plant acquisition by different entities.

The challenge is that detailed project-level data required to build proper financial models are not fully available. To nevertheless evaluate the possibilities of early coal retirement, future work will model archetypical plants using cash flow analysis to compare the financial outcomes across different retirement mechanisms.

Early Coal Retirement in Pakistan: Challenges and Opportunities

The third presentation introduced Pakistan's coal sector and the challenges of early coal retirement. China plays an important role in sponsoring Pakistan's energy sector, and in particular, has contributed to the construction of the majority of Pakistan's coal-fired power plants over previous years. In 2015, Pakistan operated only 0.15 GW of coal capacity; in 2022, with Chinese support, Pakistan operates 4.62 GW with a cumulative investment of about \$6.7 billion.

While Pakistan signed up to the ADB's ETM for evaluating early coal retirement, retiring in fact seems challenging for several reasons.

First, Pakistan's coal fleet is relatively young – under five years of age. This makes retiring more challenging: Most coal-fired power plants have not paid off their debts yet with estimated debt service for each Pakistani coal plant potentially ranging from \$665 million to \$1.2 billion. For the owners, the coal-fired power plants are extraordinarily profitable, and according to the contractual agreements, guaranteed return on equity (ROE) could range between 27 to 35 percent.

Second, Pakistan's coal-fired power plants were financed through sovereign guarantees to ensure project sponsors receive payment on time. Pakistan's Central Power Purchasing Agency-Guarantee (CPPA-G) owes \$1.4 billion to the existing coal-fired power plants.



Third, under the China-Pakistan Economic Corridor (CPEC) project, Power Purchase Agreements (PPAs) are difficult to renegotiate, as they were established as part of governmental projects. It might imply that the plants were not intended to compete on a least-cost basis.

The overall coal situation in Pakistan is challenging and contradictory: Pakistan pledged to stop coal financing; however, it is still pushing to commission a new coal-fired power plant project in Gwadar, with support from China (Nicholas and Isaad 2022).

Overall, retiring local mines and new coal-fired power projects could cost \$18 billion and if replaced by renewable energy infrastructure, this could increase by \$20-\$30 billion. As Pakistan does not have a carbon market or other appropriate mechanisms for incentivizing renewable energy investments, it might be difficult to ensure sufficient revenue streams for investors.

Panel Discussion

Following the presentations, the workshop asked a series of questions to a panel of experts representing development finance institutions, academia, think tanks and the private sector. This section summarizes the panel discussion.

What are some promising examples of coal retirement and coal retirement mechanisms?

First created by the World Economic Forum, the ETM was then operationalized by the ADB. The ADB has conducted several pilot projects, primarily in Indonesia, the Philippines and Vietnam. ADB's goal for the ETM is to apply the mechanism to other countries in Asia, Africa and Latin America. Early studies on the applicability of the ETM are already published on ADB's website, and more feasibility study results will be released soon (ADB 2022). The goal is to make the ETM fully adaptable to every country and to be able to consider countries' regulatory set-ups, political economy and social dimensions.

While the ADB and the World Bank are jointly supporting countries like Indonesia to prepare its investment program for early retirement, catalyzing private investment should be emphasized, because there are not enough concessional resources. To accelerate the application of the ETM, carbon pricing could further improve the business model, while policy frameworks and regulatory frameworks should promote investment in clean energy and storage capacities.

What additional partnerships are needed to accelerate coal retirement? What role can China play in addressing early coal retirement?

China must share best practices on coal retirement with countries along the BRI and connect with the global community. China should enhance its participation in the Coal Asset Transition Accelerator (CATA), a forum funded by the European Climate Foundation. This initiative serves as a knowledge hub between governments, utilities and civil society to share practices on how finance could support the transition away from coal. The ETC founded during COP26 is also a relevant way to engage with multilateral development banks (MDBs). China should redirect its technical expertise to work on coal retirement.

China is the world's largest producer of wind and solar energy technologies, and the country saw a surge in renewable deployment in its total power generation in 2020 (BP 2021). China even stopped providing subsidies to clean power projects in regions with energy curtailment. Even though China has ambitious plans for deploying renewable energy, it remains challenging to completely phase out coal domestically in a short period of time. China is facing similar problems as Pakistan and Indonesia in phasing out its coal-fired power plant fleet, which is relatively young. If China phases out



its coal fleet too quickly, it might affect energy supply and cause financial burdens. The phase-out of coal plants will have to happen in tandem with increasing competitiveness of renewable energy. The coal phase-out could be done on a flexible basis in decreasing the operation hours of coal power plants and paying coal plants for the provision of baseload services.

How can creative financial mechanisms for early retirement accelerate the construction of more renewable energy capacity?

One potential mechanism for financing coal-to-renewables transitions is debt swaps, which refer to a creditor country or institution agreeing to alleviate debt burdens in a borrowing country in exchange for commitments to, for example, climate mitigation efforts. Coal development in Pakistan was supported financially by lending from China and MDBs. Currently, however, Pakistan is experiencing debt distress, and there are ongoing negotiations for supplementary aid and recovery packages through the International Monetary Fund (IMF) and others to alleviate debt issues. To achieve its nationally determined contributions (NDCs) under the Paris Agreement, Pakistan's government needs to expand its clean energy programs: thus, one potential solution would be an international collaboration, including for example, the option of a debt swap with China in exchange for climate mitigation-related activity.

How can the private sector be incentivized to participate in early coal retirement?

Countries with sub-investment grades need to apply new ways to approach to financial markets: they need to mobilize international investors and tap into private capital by utilizing concessional funding from development finance institutions, e.g., through blended finance.

Furthermore, multinational insurance companies can support markets with more challenges to accessing international capital by providing risk mitigation for foreign exchange exposure.

However, the track record of blended finance and project de-risking is lackluster. Moreover, mobilizing private investment to support energy transition and the early retirement of coal-fired power plants will rely on local governments' commitment to clear, ambitious and structured policies for the energy transition. Ideally, a credible national roadmap for coal-to-renewables transition needs to be created. Government bodies should improve the standards of their policy frameworks to attract private capital. There is a need for financial institutions, including pension funds, to decarbonize their assets, and initiatives have emerged to support this transition, e.g., the Glasgow Financial Alliance for Net Zero (GFANZ). Emerging market governments must provide credible green transition pathways that allows such financial institutions to commit resources for coal retirement.

Conclusion

Early retirement of coal-fired power plants is necessary to meet science-based climate targets, and yet it remains a complex and challenging prospect, especially in emerging markets. Barriers to early retirement include a relatively young and competitive fleet of coal plants in developing countries, especially Chinese-funded plants in South and Southeast Asia; the prospect of renegotiating contracts between power producers and offtakers; and the lack of an enabling regulatory environment for alternative energy sources in many countries. Despite these challenges, there are emerging programs to specifically tackle the issue of coal phase-out and coal retirement, and several highlighted during this workshop include the ADB's ETM, the CIF Accelerating Coal Transition Investment Program, the Just Energy Transition Partnership and the Coal Asset Transition Accelerator.



The workshop raised the prospect of applying such mechanisms to overseas coal plants funded by China, but China has yet to take a stance on the prospect of coal retirement overseas. Various countries have committed to ambitious carbon neutrality targets, putting coal assets at risk of becoming stranded in the future. As countries move ahead with their climate ambitions, China's financial institutions could be at risk of holding underutilized assets with attendant default risks. Therefore, China should evaluate how to support investments toward accelerating the coal phase-out.

Workshop participants emphasized the need for comprehensive consideration of social and economic impacts of coal retirement to ensure a just transition for local communities. Based on the presentations and discussion, future research on specific financial mechanisms for coal retirement will be crucial, especially research that addresses political, social and economic barriers. At the same time, to provide an enabling policy environment for coal retirement, more progress needs to be made on developing decarbonization incentives in emerging markets that still rely heavily on coal.



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