



Centre for
Sustainable Finance
SOAS University of London



Global Development
Policy Center



Workshop on the Potential for Early Coal Plant Retirement

March 23, 2022

8-10PM CST (Beijing)

Goal of workshop

The Green Finance and Development Center at Fudan University, the Center for Sustainable Finance at SOAS, University of London, and the Boston University Global Development Policy Center co-hosted a workshop on the potential for early coal plant retirement, with a focus on China's role in enabling this transition overseas. This workshop highlighted current practices and challenges of early retirement of coal-fired power plants. The workshop aimed to foster a discussion among participants, exploring how such mechanisms could be applied, for example, for Chinese overseas investments. The workshop was by invitation only.

Background

Mitigating global climate change driven by greenhouse gas emissions requires a phasing out of the burning of fossil fuels for electricity generation, in particular through coal-fired power plants. Governments, in their efforts to support a low-carbon transformation of their economies, are increasingly setting-up carbon pricing mechanisms. Furthermore, due to rapid technological advances for harnessing solar and wind energy, cost for such green energies has fallen below the cost of coal-fired power plants in most places around the world. Yet, with decades of remaining operating times of existing coal-fired power plants, a risk of high emissions paired with high electricity cost and a potential crowding out of renewable energy investments is becoming more prevalent. Against this backdrop, a number of governments and investors have provided incentives or are developing financial instruments to support early retirement of coal-fired power plants. In this workshop, some of these developments will be introduced, and options for accelerating early retirements of coal-fired power plants will be explored. The workshop will also highlight some of the challenges for achieving socially just transitions.

Agenda

Welcome

Cecilia Han Springer (Boston University)

Opening remarks

Rhys Gordon-Jones (Embassy of the United Kingdom in Beijing)

Matt Webb (Department for Business, Energy & Industrial Strategy at the United Kingdom Government)

Presentations and Q&A

Moderated by Ulrich Volz (SOAS, University of London)

- Global best practices of early coal-retirement and their application to China's Belt and Road Initiative: Mengdi Yue (Fudan University) and Christoph Nedopil (Fudan University)
- Exploring financial mechanisms for early coal retirement – potentials and challenges: Alex Clark (University of Oxford & Boston University) and Cecilia Han Springer (Boston University)
- Country perspectives – Pakistan: Hanea Issad (IEEFA Pakistan)
- Country perspectives – Indonesia: Alin Halimatussadiah (Environmental Economics Research Group Universitas Indonesia)

Panel discussion

Moderated by Christoph Nedopil (Fudan University)

Panelists:

- Toru Kubo (Asian Development Bank)
- Camilla Fenning (E3G)
- Wang Ke (Renmin University of China)
- Hina Aslam (SDPI Pakistan)
- Melissa Brown (Daobridge Capital)

Closing remarks

Organizers

- Green Finance & Development Center, FISF Fudan University
- Centre for Sustainable Finance, SOAS, University of London
- Boston University Global Development Policy Center

The workshop was partly supported by the UK Government's UK Pact programme.

Workshop summary

On March 25, 2022, the Green Finance & Development Center at FISF Fudan University, together with the Centre for Sustainable Finance at SOAS University of London and Boston University's Global Development Policy (GDP) Center organised a closed-door workshop on discussing potentials and strategies for accelerating the retirement of global coal-fired power plants. During the workshop, participants from over 15 countries shared current efforts, strategies and regulatory, social and financial challenges on this topic. The workshop was supported by the UK Pact Programme.

A question of retiring 2,000 GW of coal-fired power plants

Globally, there are more than 2,000 GW of coal power in operation, accounting for about 30% of global CO₂ emissions. To meet the Paris Agreement and avoid catastrophic climate change, all coal capacity should be phased out by 2040.

Yet, a fundamental dilemma of the 21st century is reconciling the need to de-carbonize with the rising demand for energy in rapidly industrialising countries, notably in South Asia: in many South-East Asian countries, coal fired power plants tend to be younger with a long lifetime ahead, while energy needs are still rapidly rising.

A particular focus of the workshop was the role of China in supporting the green transition and evaluating potentials for early coal retirement in its overseas investments. China was one of the largest sponsors of overseas coal, particularly through its Belt and Road Initiative (BRI). Yet, China is gradually shifting its overseas energy investment strategies to favour more renewables and can position itself as a provider of sustainable development finance. Xi Jinping's announcement to stop coal overseas investments raised the potential question of how to accelerate the phase-out of existing coal-fired power-plants fleet to meet emission targets.

Yet, coal retirement is highly complex. Clearly, various countries have committed to ambitious carbon neutrality targets, putting coal-assets at risk of becoming stranded in the future. Should countries really move ahead with their climate ambitions, China's financial institutions could be risk of holding underutilized assets with relevant default risks. Alternatively, China could evaluate how to support investments toward accelerating the coal phase-out.

During this closed-door workshop, experts from financial sector, development finance institutions, academia and think tanks shared current practices, strategies and challenges to foster discussion among participants for early coal retirement under Chatham House rules.

Opening remarks

The opening remarks highlighted the success stories from bilateral cooperation between China and the UK and what how the UK. The UK was a significant coal-producing and consuming country, but it completely redefined its energy mix over the years and was able to phase out coal in a few decades. The UK Government policies played a central role in implementing targets to help establish a long-term direction for the industry shift to renewables. The UK Government also created ambitious renewable energy support schemes

and heavily subsidized renewables energy capacities. As a result, the UK cut its emission by 40% since 1990 and grew its economy by two-thirds. UK's experience shows that energy transition does not need to come at the expense of economic growth but instead as an opportunity to build a more resilient economy.

The UK is also supporting international coal-phase out efforts: One of the most breakthrough international commitments to phase down coal was adopted at the 2021 UN Climate Change Conference held in Glasgow, UK. 77 countries adopted the Glasgow Climate Pact and agreed to phase out inefficient fossil fuel subsidies and phase down unabated coal power. Alongside this ambition, The Energy Transition Council (ETC) was an important initiative of the summit that supports dialogue between developing economies and serves as a platform to enhance technical, financial, and political collaborations in the power sector. This comes in addition to several innovative financial mechanisms that support a green transition, notably the ADB's '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 social climate finance.

On the occasion of COP26, UK business secretary Kwasi Kwarteng and China's National Energy Administration (NEA) Administrator Zhang Jianhua also reaffirmed both countries' collaboration in the Energy Sector. The UK-China Clean Energy partnership fosters cooperation toward developing clean technologies, flexible markets, and open investment opportunities.

Presentations:

The first presentation tackled global best practices of early coal retirement and application to China's Belt and Road Initiative. This study proposed financing and policies options and drew recommendations on strengthening China's actions on retiring its overseas coal assets.

The presenter highlighted that different global approaches of 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 financially early coal retirement. One of the leading examples is the ADB's Energy Transition Mechanism (ETM), which has two separate funds: one for buying out the plants, and another fund for supporting renewable infrastructures.

Secondly, the Climate Investment Fund'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 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 and owns over half of the existing coal capacities. 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 is nevertheless encouraging that the value of Chinese invested coal plants overseas peaked from 2015 to 2016 and then declined to less than 2 billion USD in 2020.

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 pilot countries on the political, social, and economic levels. Finally, develop appropriate financial mechanisms and alternative energy scenarios with pilot countries to ensure energy security.

The second presentation looked in detail at the financial mechanism's options available for early retirement of coal 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 are the leading financial entities, with most of their coal fleet based in South Asia. Financial flows for additional new coal projects have dropped, but the existing fleets still have more than twenty years' intended lifetime, making it difficult to wind down quickly.

To speed-up coal phase-out actions China could consider several financial mechanisms, such as debt refinancing options with low-interest rates, redirection of cashflows to refinance the coal plant's fleet into new clean capacities and encouraging the plant's 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 and subcritical plants using cashflow analysis to compare the financial outcomes with different retirement mechanisms and model sensitivity.

The third presentation introduced Pakistan's coal development sector and the challenges of early coal retirement.

China plays an important role in sponsoring Pakistan's energy investments, and in particular has contributed to the construction of the majority of Pakistan's coal fired power plants over the past years: In 2015, Pakistan operated only 150MW of coal capacity; in 2022, with Chinese support, Pakistan operates 4.62 GW with a cumulative cost of about 6.7 billion USD. Most of Pakistan's fuel is imported coal, rather than domestic coal. While Pakistan signed up to the ADB's ETM for evaluating early coal retirement, retiring in fact seems challenging.

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

Second, Pakistan's coal-fired power plants were financed through sovereign guarantees to ensure that the project sponsors get their payment on time. Pakistan's Central Power

Purchasing Agency-Guarantee (CPPA-G) owes 1.4 billion USD to the existing coal 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 coal-situation in Pakistan is even more challenging – and contradictory: Pakistan pledged to stop coal financing, however, it pushes to commission a new coal fired power plant project in Gwadar, which would use locally sourced coal.

Overall, retiring local mines and new coal power projects could cost 18 billion USD and if replaced by renewable energy infrastructures, it could increase by 20 to 30 billion USD. As Pakistan does not have a carbon market, it might be difficult to ensure sufficient revenue streams for investors.

The fourth presentation introduced Indonesia's coal development sector and the challenges of early coal retirement.

Indonesia aims to become net zero emissions by 2060 and phase out coal by 2040. To achieve this goal, Indonesia needs an Energy Transition Roadmap with policies, incentives, and enabling financing strategies to reach those goals.

However, currently, coal accounts for 60% of Indonesia's electricity mix. The government retrograded its ambitions to decrease coal capacity from 9GW to 5.5 GW and 20 GW coal power plants under planning for 2030. Those actions could delay the coal phase-out from 2040 to 2060.

However, Indonesia's energy planning suffered from over-estimations of energy needs including already agreed power purchase agreements (PPAs) for the capacity. This led to over-investment and an oversupply of energy, particularly on Java.

A challenge for Indonesia's early coal-retirement is the low cost of coal: while IRENA stated that renewable energy was more profitable than coal, this is not the case in Indonesia. Coal is more competitive than renewable because of structural problems: Indonesia has a cap on the price of coal as a fuel, making coal cheaper than on the global markets, while Indonesia installed local content regulations for renewable energy technologies that reduces the availability and increases the price of renewable energy technologies.

To overcome this, Indonesia's government could establish subsidies programs to support the integration of renewable energies. Nevertheless, early coal retirement projects would cause a double burden with the need to finance new renewable capacity and early coal retirement. According to estimates by the Ministry of Finance, 48 billion USD would be needed if Indonesia wants to retire the 20GW coal power plants capacity.

Panel Discussion:

Could you share the ambitions behind the ADB's work on Energy Transition Mechanism and Carbon Market Program?

Don Kanak from the World Economic Forum created Energy Transition Mechanism (ETM). ADB had the role in operationalising this tool and conducted several pilot projects primarily

in Indonesia, the Philippines, and Vietnam. It has the ambition to spread 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.

The goal was to make 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, catalysing private investments 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 partnerships do we need to establish to accelerate the coal phaseout?

China has to share best practices on coal retirement with countries from 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 societies to share practices on how finance could support that transition away from coal. The Energy Transition Council (ETC) funded during COP26 is also a relevant way to engage with MDBs. China should redirect its manufacturing capabilities to work on coal retirement.

What role can China play in addressing early coal retirement?

China is the world's largest producer of wind and solar energies, and the country saw a surge in renewable deployment in its total power generation in 2020. China even stopped providing subsidies to clean power projects in regions with consequent energy curtailment.

But even though China has ambitious plans for deploying renewable energy, it remains challenging to completely phase out coal in a short time. China is facing similar problems to Pakistan and Indonesia in phasing out its coal-fired power plant fleet, which is relatively young and effective coal fleet in the short term. If China phases out its coal fleet too quickly, it might affect the security of the national energy supply and causes financial burdens. The phase-out of coal plants could be complete solely after 10 to 20 years when renewable will be more competitive.

Coal phasedown could be done on a flexible basis in decreasing the operation hours of coal power plants and paying coal plants for the provision of baseline services.

How can we use financial mechanisms to accelerate the construction of more renewable energy capacities?

Coal development in Pakistan was supported financially by China and development banks. At this time, however, the Pakistan economy is experiencing a significant crunch with negotiations for supplementary aid and recovery packages through the IMF and others to alleviate debt and economic issues.

Also, Pakistan continues to have contradictory plans in terms of accelerating renewable energy in the energy mix of Pakistan: while investments in the coal sector are pushed, the government-imposed taxes on solar panels.

To achieve its NDCs, Pakistan's government needs to expand its clean energy programs: The potential solution would be an international collaboration, including for example, the option of a debt swap with China.

Furthermore, grid capacity should be expanded to handle the large quantity of variable energy. The Sustainable Network for Clean Energy Program is an initiative in Pakistan to increase partnerships and collaboration between decision-makers.

What levers should we work on to get the private sector involved in coal phaseout?

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 utilising concessionary money from development finance institutions, e.g., through blended finance.

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

However, mobilising private investment to support energy transition and the early retirement of coal-fired power plants much relies on local governments' commitment to clear, ambitious and structured policies for the energy transition: Ideally, a national roadmap needs to be created in a credible context of a policy setting. Government bodies should improve the standards of their policies framework to attract private capital. Particularly with the need for many Western financial institutions including pension funds to de-carbonize their assets (e.g., through the Glasgow Financial Alliance for Net Zero (GFANZ)), emerging markets governments must provide credible green transition pathways that allows such financial institutions to commit money and hold a coal retirement asset.