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# Accelerating Coal-to-Clean Energy Transitions:

## First Report and Recommendations of the Coal Transition Commission

November 2024

# Foreword

Climate change is accelerating and its catastrophic consequences are multiplying around the globe. Coal is the most carbon-intensive fossil fuel, and if existing coal power plants and industries run as planned, they will alone push the world beyond 1.5°C of global warming.

The science is clear: reducing emissions from coal power is an urgent priority. The International Energy Agency (IEA) has highlighted the need to immediately end new coal power while completely phasing out unabated coal power by 2040. Yet, global coal capacity increased by 2% last year.

Reversing this trend and walking the talk will be challenging. Coal is central to the power systems, and economies of many emerging countries and workers and communities across the world rely on incomes from coal. In Indonesia alone for instance, it will cost an estimated $97.3 billion between 2023 and 2030 to deliver an accelerated coal-to-clean transition.

As recalled in the Paris Pact for People and the Planet, no country should have to choose between the fight against poverty and the protection of our planet; it is therefore essential that financing is rapidly scaled up to support just and country-driven transitions.

The Coal Transition Commission was established to develop a shared plan for addressing this challenge, as part of the broader Coal Transition Accelerator launched by France at COP28 in order to facilitate just transitions from coal to clean energy. This report has been informed by discussions with governments of advanced and emerging economies, public and private finance and international organisations, whose engagement over the last year has been invaluable. It highlights key recommendations and puts forward three main messages.

First, governments have a primary role to play in delivering accelerated coal-to-clean transitions, through appropriate policies and commitments, taking into account their national contexts. They should be supported to draw up the energy and just transition plans that will set the direction and create the enabling conditions which give citizens, investors and businesses the confidence to engage in the transition.

Second, finance must be increased, with a focus on mobilising private capital at scale, given the extent of the costs which need to be covered. This implies a collective work to develop the instruments and guardrails that will ensure both credible emissions reductions and reasonable returns for private investors. Appropriate regulations and guidance may also be needed to address concerns from private finance about the risks of investing in coal phase-out.

Third, the pipeline of projects needs to be rapidly increased, focusing on early retirement and repurposing for flexibility – the two most important levers for achieving emissions reductions in a 1.5°C pathway, as shown by the IEA in its report. Despite some encouraging initiatives, notably through the Just Energy Transition Partnerships (JETPs), the number of case studies to learn what works and establish models that can be replicated remains insufficient. Sustained collaboration between governments, public and private finance through the Coal Transition Commission can drive this work forward.

In the face of emerging questions about the commitment of the international community to deliver the ambition agreed in the first Global Stocktake at COP28, the next step is to turn the recommendations of this report into action. This would demonstrate that while the issues are tough, there is a pathway to success. It would create real momentum as we approach the ten years anniversary of the Paris Agreement at COP30, where climate ambitions will have to be significantly enhanced to keep 1.5°C within reach. It will also allow governments to seize the economic and social benefits from accelerated coal-to-clean transitions, which greatly exceed their costs of inaction over the long term.

France remains committed to drive this agenda forward through the Coal Transition Commission and calls upon all relevant stakeholders to join this effort.

**Agnès Pannier-Runacher**
Minister for the Ecological Transition, Energy, the Climate and Risk Prevention

# Acknowledgements

The Coal Transition Commission Report is the result of extensive consultations and numerous rounds of engagement with national policymakers, multilateral development banks, and private finance. It also benefited from valuable input from international and technical organizations, as well as contributions from expert bodies. Regular consultation workshops and meetings were held over the past year with representatives from various governments and organisations offering valuable insights and feedback for this report. We are grateful for their input.

This report was coordinated and led by the Secretariat of the Coal Transition Commission in close collaboration with the French and Indonesian governments, the co-chairs of the Coal Transition Commission. The guidance and constant support of Rachmat Kaimuddin, former Deputy Coordinating Minister of Maritime and Investment Affairs in Infrastructure and Transportation in the Indonesian Government and Kevin Magron, Climate Ambassador for the French Government has been particularly valuable.The work of the CTC and this report has also benefited from the sustained support and input from the PPCA co-chairs, the governments of Canada and the UK.

We would like to express our sincere thanks to the International Energy Agency (IEA) (Brent Wanner and Yasmine Arsalane) for authoring Chapter 1. The data and insights provided in this Chapter have greatly enriched the report.

Special thanks go to the following organisations and initiatives for their valuable contributions: Asian Development Bank (ADB), Banque de France, Bloomberg Philanthropies (Annya Schneider and Rui Luo), Carbon Trust, Climate Investment Funds (CIF), Climate Policy Initiative (CPI), Danish Ministry of Climate, Energy and Utilities, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), E3G, Environment and Climate Change Canada (ECCC), European Bank for Reconstruction and Development (EBRD), European Commission (EC), European External Action Service (EEAS), European Climate Foundation (ECF), Federal Ministry for Economic Affairs and Climate Action (BMWK, Germany), French Ministry for the Economy and Finance (DGTresor), Department for Energy Security and Net Zero (DESNZ), Glasgow Financial Alliance for Net-Zero (GFANZ) Secretariat (Alice Carr, Raphael Chaskalson and Randi Kristiansen), Institute for Climate Economics (I4CE), Inter-American Development Bank (IDB), International Energy Agency (IEA), International Monetary Fund (IMF), Ministry of Energy (Chile), Ministry of Energy (Colombia), Ministry of Energy, Mines and Sustainable Development (Morocco), Monetary Authority of Singapore (MAS), National Climate Change Secretariat (Singapore), One Planet Sovereign Wealth Funds (OPSWF), The Organisation for Economic Co-operation and Development (OECD), Powering Past Coal Alliance (Binnu Jeyakumar, Helena Gray, Julia Skorupska and Simon Beauvais), the Presidential Climate Commission and Just Energy Transition Project Management Unit (South Africa), Rockefeller Foundation, Reclaim Finance, Rocky Mountain Institute (RMI) (David Lone, Dhroovaa Khannan, Lila Holzman and Tyeler Matsuo), United Nations (UN), U.S. Department of State, World Bank, World Economic Forum (WEF).

While the Secretariat of the Coal Transition Commission has done its best to reflect the valuable insights provided by all of these organisations, we recognise that our efforts have been at best partial. The text of the report has been prepared by the Secretariat of the Coal Transition Commission and should not be taken as representing the views of any of the above organisations.

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# EXECUTIVE SUMMARY

**Accelerating the coal-to-clean transition is one of the most important steps the world can take to realise the goals of the Paris Agreement.** Coal remains the largest source of electricity worldwide, representing 36% of generation globally, and accounts for over 40% of all energy sector emissions of carbon dioxide. Without additional intervention, the existing coal fleet alone would push the world beyond 1.5°C of warming.[1] In response to this challenge, in late 2023 the Conference of the Parties (COP28) called for "transitioning away from fossil fuels in energy systems in a just, orderly and equitable manner" including the specific call for parties to begin "accelerating efforts towards the phase-down of unabated coal power"[2] and there are encouraging signs that a growing number of governments, businesses, and technical bodies are at work to accelerate coal transitions.[3]

**Accelerated transitions from coal to clean energy are essential for the climate and can also bring social and economic benefits.** The International Monetary Fund (IMF) has estimated that, every $1 invested in coal phaseout and renewables replacement globally can bring $3 in social and economic benefit.[4] The International Energy Agency (IEA) estimates that in most countries in the world, renewables are cheaper to use than coal-fired power plants.[5] There is also growing evidence that investing in the coal-to-clean energy transition generates economic growth, more clean energy jobs than those that are lost from coal transition, and that countries with higher proportions of clean energy generation will enjoy wider competitive advantages as industries globally look to decarbonize their supply chains.[6] Furthermore, the coal-to-clean transition will reduce air and water pollution and its negative impacts on health.[7]

**However, countries seeking to deliver accelerated coal-to-clean energy transitions face significant challenges.** Such transitions have been difficult for advanced economies to deliver and are harder still for emerging market and developing economies (EMDEs). In many EMDEs coal continues to play a significant role in electricity generation, the existing coal fleet can be significantly younger, and some countries have strong economic dependence on coal due to the importance of coal mining for economic growth and labour markets. If the coal-to-clean transition is to be delivered in a fast, effective and just fashion it must be country driven and take into account the key principles of the Paris Pact for People and the Planet that:

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[1] IEA, Accelerating Just Transitions for the Coal Sector, 2024
[2] Conference of the Parties serving as the meeting of the Parties to the Paris Agreement at COP28, Global Stocktake decision, 2023
[3] Global Energy Monitor, Boom and bust coal, 2024
[4] IMF, The Great Carbon Arbitrage, Adrian, T, Bolton, Kleinnijenhuis, A, 2022
[5] IEA, World Energy Outlook 2023, 2023
[6] IEA, Coal in Net Zero Transitions, 2022
[7] IEA, Accelerating Just Transitions for the Coal Sector, 2024

- no country should have to choose between the fight against poverty and the protection of our planet;
- each country may follow its own national path; and
- enhanced public and private financial support is necessary to fast-track energy transition in developing economies.

**To ensure that the world makes progress on this important issue, the Coal Transition Commission (CTC) was established at COP28.**[8] The CTC has been co-chaired by the governments of France and Indonesia and brings together policymakers from a diverse set of countries, relevant international organisations and financial institutions, to find ways to develop approaches that can be delivered at scale and unlock new sources of financing for coal-to-clean transitions in ways that ensure a just transition and access to affordable, reliable and clean energy for all. This initial report attempts to set out key steps that the world needs to take to enable an accelerated and just transition out of coal. Much collaborative work lies ahead in key countries and across international organisations and the private sector to support accelerated coal transitions and to further understand and identify ways to make progress on the issues identified here.

The CTC is part of a wider initiative launched at COP28 by the French Government, namely the Coal Transition Accelerator (CTA), which has two additional and complementary pillars of work. The first is work by the World Bank to advance a strategy to decrease the cost of capital for investments in clean energies in EMDEs. The second is work by the Organisation for Economic Co-operation and Development (OECD) to establish voluntary guidance for financial institutions on financing the transition from coal to clean energy.

**Chapter 1 of the report sets out the results of IEA modelling of the emissions reductions from coal-fired power plants needed to achieve the goal of the Paris Agreement of limiting temperature rise to 1.5°C.** It shows the need to immediately end the approval of new unabated coal-fired power plants and to phase out existing unabated coal in the power sector by 2040 worldwide. It also considers the characteristics and role of four broad levers that can be used to deliver reductions in emissions from existing coal power plants. Its results indicate that early retirement is the most important long-term lever to reduce coal power emissions over time—representing two-thirds of necessary emissions reductions in a 1.5°C-consistent pathway—and there also is a significant role for repurposing coal plants to operate more flexibly, especially in EMDEs and in the near term.

**Chapter 2 addresses the wider government policy needed to support a transition from coal-to-clean power.** It sets out the broad policy toolbox available to governments, including highlighting the importance of comprehensive energy sector planning and policy and regulatory changes designed to create a level playing field for clean energy. It offers some considerations for how this policy toolbox can be adapted to reflect the broader policy objectives, implementation challenges, and market structures faced in different jurisdictions to balance potential trade-offs across climate, economic, and energy security goals.

[8] Elysée, Press release launch of the Coal Transition Accelerator, 2023

**Chapter 3 considers the role of finance in enabling the coal transition, looking at estimates of the underlying costs of the transition and proposing options to increase the availability of coal transition finance.** The report groups costs into:

(i) asset-level costs associated with ending, reducing, or changing the operation of existing coal power plants before they have reached the end of their anticipated life
(ii) system-level costs including building out replacement renewable energy, storage, adapting the grid, and supporting workers and communities impacted by the transition.

**While some public financing support for coal transitions is available, such as through the Climate Investment Funds - Accelerating Coal Transition (CIF ACT) investment programme, the current level falls short of what would be needed to deliver progress at the speed required to get on track to limit warming to 1.5°C.** Given the scale of financing required for EMDEs outside China to reduce emissions from Coal Fired Power Plants (CFPPs) - estimated by the IEA to be roughly $60bn annually, between 2022 and 2030 - there is a need to develop solutions that can mobilise public, private and innovative carbon finance. This will require addressing the challenging economics and lack of returns associated with coal power plant retirement, repurposing for flexibility, and just transition provisions. Government or philanthropic grants are one source of such loss absorbing capital but currently fall far short of the sums required. Emerging sources of innovative finance including high integrity coal-to-clean carbon credits are potentially another source, and work is in train to develop and validate a frameworks that will need to provide a high degree of confidence that they will deliver reliable emissions reductions.

**The report finds that scaling all types of finance will also depend on greater global clarity on the environmental and social guardrails under which support for coal transitions can be considered consistent with 1.5C-aligned goals.** Doubts about what the appropriate guardrails to underpin emissions reductions integrity, and whether new investments in CFFPs with the aim of retiring them or operating them flexibly will be considered transition finance, are obstacles to securing necessary finance. Several bodies have begun putting forth proposals for realistic near-term guardrails for coal retirement transactions, including for financial institutions. These guardrails must strike a balance between setting appropriately high expectations while not precluding innovation to establish new technical and financing approaches that achieve positive emissions reduction impact. Such guardrails would benefit from recognition by governments as well as integration into frameworks and standards that guide financial decision-making, such as financial regulation and reporting standards.[9]

**Chapter 4 focuses on the pipeline of projects or programmes, finding international interest in supporting coal retirement projects currently outpaces the number of projects that need support.** It reviews the small but growing number of initiatives working on piloting solutions, some focusing on government-driven jurisdictional approaches and others on catalysing projects bottom up. It notes that given different contexts, there is unlikely to be a one-size-fits-all approach and concludes that we are not yet at a stage where we can draw clear conclusions about what approaches to scale and how. Rather the priority remains on identifying and implementing a broader range of emissions-reducing pilot projects and ensuring that learnings are effectively captured and shared. For these early transactions, sustained co-operation between government, philanthropy, public and private finance and civil society will be key. A multi-stakeholder platform like the CTC is well-placed to facilitate such co-operation.

[9] GFANZ APAC Network, Financing the Managed Phaseout of Coal-Fired Power Plants in Asia Pacific, Nov 2023

## Summary of key recommendations from the report

**Recommendation one: Further work should be undertaken by the IEA and other relevant technical bodies to provide guidance - and develop practical experience - on how and when to most effectively deploy the different policy levers available to reduce emissions from existing coal power plants.** The IEA has set out four levers that can be used to reduce emissions from existing coal power plants and initial considerations on when different levers might be most appropriate, with early retirement playing the largest role, followed by repurposing for flexibility. Given the challenges faced by some EMDEs, scaling the use of these levers will require concerted efforts and collaboration by national governments, international partners, companies, and public and private finance underpinned by a shared understanding of how and when to use these levers. This further work is needed both for early retirement – which has benefitted from much focus in recent years and, to an even greater extent, for repurposing for flexibility which is less well understood.

**Recommendation two: To support the effective use of levers like early retirement and repurposing coal plants for flexibility at a greater scale, governments will need to pursue key enabling policy measures informed by their national circumstances.** These include:

- political commitments to build no new coal and timelines for phasing out existing coal
- comprehensive power sector transition planning and implementation
- development of ambitious just energy transition plans informed by local consultation
- regulation to account for air pollution impacts
- supporting deployment of and ensuring fair competition of clean energy resources against coal through economic incentives, competitive and transparent procurement processes, pollution standards, removal of subsidies, measures to improve utility performance, and market design that enables clean energy deployment,

It is recognised that in pursuing these measures the distributional costs and other challenges of an orderly and affordable energy transition will need to be considered.

**Recommendation three: National Governments should develop just energy transition plans informed by local consultations and ILO guidelines. All partners to coal-to-clean transitions should look to ensure that the question of how to deliver a just transition is addressed in all coal-to-clean transition activities that they support and finance.** There are increasing examples of best practice around how to involve workers, unions and communities in planning for a just transition. By drawing on this guidance and working with affected groups to develop plans for the transition governments and supporting partners can help protect and promote the interests of workers and communities.

**Recommendation four: Multilateral development banks and other public finance providers, should continue to scale up support and finance for accelerated coal-to-clean transitions, including by using their technical assistance, project preparation and catalytic capital to support country ambition and to crowd in private and innovative carbon finance.** Public finance providers could, for example, consider supporting project development alongside setting targets for desired public to private finance ratios and devote resources to developing innovative new technical and financing approaches designed to attract greater private finance interest.

**Recommendation five: Consistent with mandates in their jurisdictions, governments and regulators could consider clarifying that finance provided to support accelerated coal-to-clean transitions that meets necessary guardrails is considered transition finance.** This recognition of coal transition finance could be reflected in sustainable/transition finance taxonomies and other financial regulation and guidance. It is important to address the regulatory and institutional barriers to coal transition investments, to allow the financial sector to play a problem-solving role, rather than simply divesting which does not always support – and can hinder – transition. Additionally, recognising that these types of transitions will benefit from consistent levels of transparency and scrutiny across jurisdictions, international financial reporting standards bodies, such as the International Sustainability Standards Board, could set out guidance on disclosures to enable stronger and more consistent reporting on coal transition finance, including to deliver rigorous and prudent assessments of emissions reductions achieved relative to robust baselines.

**Recommendation six: Recognising the importance of mobilising private finance to support coal-to-clean transactions alongside use of public and other loss-absorbing finance, net zero committed private financial institutions are encouraged to support the development and financing of innovative transactions and programmes.** This would require financial institutions to understand the technical nature and emissions reductions potential of these transactions, to update any voluntary coal policies and risk appetites to accommodate such transactions, to understand the guardrails and form a view that they have been met, and to disclose sufficient information on any transactions supported.

**Recommendation seven: Recognising that even if public and philanthropic catalytic capital is significantly scaled, the costs associated with coal-to-clean transitions will necessitate additional finance, governments and technical bodies should explore further innovative solutions, including high integrity coal-to-clean carbon credits.** Governments and regulators should engage with the range of initiatives that are exploring jurisdictional and asset-level solutions - including coal-to-clean credits sold through Article 6 or the voluntary market - to understand their potential benefits and risks and guardrails being developed to manage these risks and ensure these instruments meet high supply and demand-side integrity standards.

**Recommendation eight: Commission participants might consider further work through the Coal Transition Commission to monitor progress on these recommendations and to scope and develop nascent and new technical and financing approaches, ensure that lessons learnt across different geographies and pilot projects are available to all, and to support the development of new projects.** Finding and developing opportunities to support the early retirement or repurposing of coal power plants is difficult and there are few pilot projects. Philanthropic initiatives are playing a vital role in addressing these challenges, but greater co-ordination between these initiatives and across governments, international organisations, civil society and the private sector would help identify key opportunities and pioneer new approaches and learnings.

**Specific activities the CTC could consider over the next two years might include:**

## Scoping new technical and financing approaches

Developing definition, use case, routes to finance and guardrails for repurposing as a lever. Scoping the challenges and opportunities of retiring older coal plants. Developing and supporting implementation of guidance around reflecting finance for early retirement and repurposing in transition finance taxonomies.

## Sharing lessons learnt across geographies

Consolidating lessons learnt and best practice, especially around implementing and financing a just transition, and delivering coal retirement transactions.

## Supporting the development of new projects

Developing a structured approach to the provision of capacity building to countries looking to accelerate progress, including by working with governments, utilities, financial institutions and civil society to establish a pipeline of plants suitable for retirement/ repurposing.

01

# Coal-to-Clean Transitions for a 1.5°C Future

## Landscape

Global coal demand has remained consistently high over the past decade and accounts for about 27% of the world's total energy supply in 2023, making it the second-largest energy source after oil. These global trends mask strong regional differences (Figure 1). Coal demand in advanced economies (AE) peaked in 2007 and has declined by 45% since 2000, but this has been more than offset by the tripling of coal use in emerging market and developing economies (EMDE) over the same period. EMDEs collectively account for 85% of global coal demand in 2023, led by China (58%) and India (12%). China's electricity sector alone accounts for over 35% of global coal consumption, despite the country's advances in clean energy.

China currently has the highest level of coal consumption per capita, at nearly 2.5 tonnes of coal equivalent (tce). While this is several times higher than other countries, it is still below the per capita coal consumption of the United States (US) in the early 2000s. Since then, the US has shifted towards natural gas and renewables, dropping below 1 tce coal per capita in 2023. Other advanced economies, India, and other EMDEs all have lower per capita rates of coal consumption than China and the United States today.

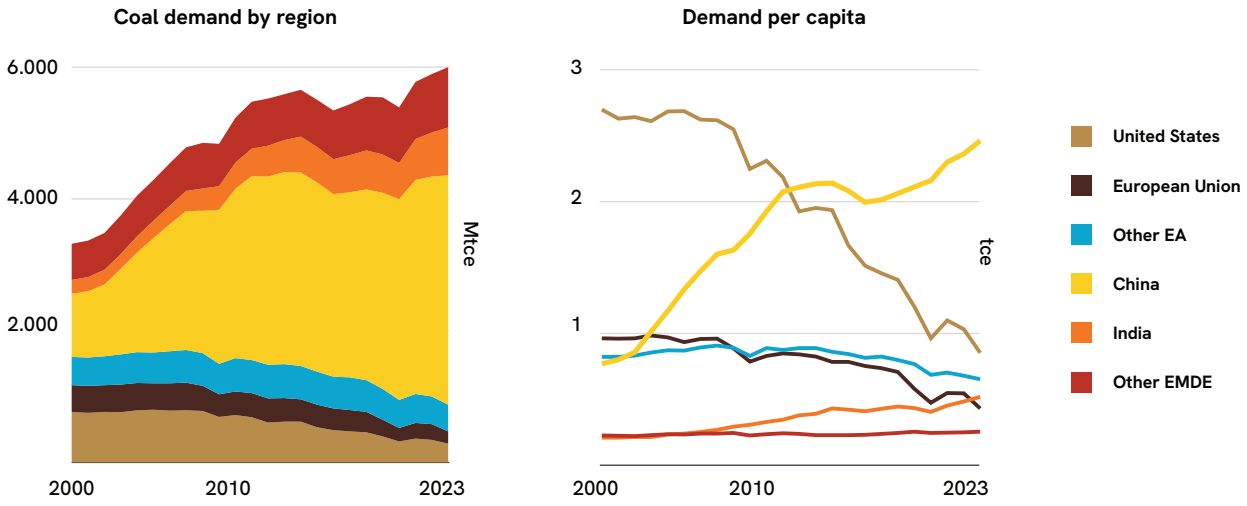


Figure 1: Coal demand in total and per capita by country/region, 2000-2023

Dependence on coal is multifaceted. The IEA Coal Transition Exposure Index, developed for the Coal in Net Zero Transitions report,[1] helps identify countries where the transition is expected to be most difficult, considering coal's role in their energy systems and their economies, local development, and potential lock-in risks. Scores have been calculated for a selection of countries that represent more than 90% of global coal production and consumption based on key indicators such as coal share in total energy supply, gross domestic product (GDP) per capita, coal self-sufficiency, and the age of coal plants. The analysis highlights that national exposure to coal transitions is highest in Indonesia, followed by Mongolia, China, Viet Nam, India, and South Africa.

[1] IEA, Accelerating Just Transitions for the Coal Sector, 2024

The US, Japan, and the European Union (EU) display a modest dependency on coal in both economic and energy sector terms (Figure 2). With the exception of the US, these countries are all net importers of coal and coal mining no longer plays a major role in the economy. Their coal-fired fleet is also relatively old on average. On the other hand, Indonesia and China heavily rely on coal to meet their growing energy demands. Since both Indonesia and China fulfil most of their coal needs through domestic production, coal is an important component of their economic strategies. They could also face substantial challenges in undertaking early retirement of coal plants, given the relatively young age of these facilities, at less than 15 years old on average.

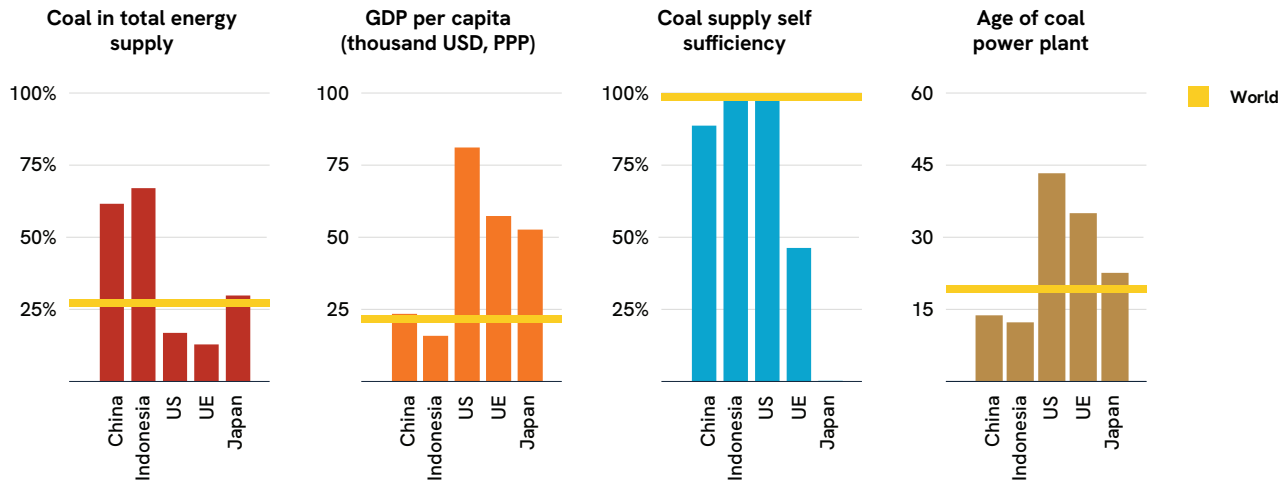


Figure 2: Key factors in the IEA's Coal Transitions Exposure Index for selected countries, 2023

Despite these challenges, coal use is on a structural decline in all the scenarios described in the World Energy Outlook 2024 (Figure 3). By 2050, global coal use drops by almost 50% in the Stated Policies Scenario (STEPS) – based on the latest policy settings – and by over 90% on the pathway for the global energy sector to achieve net zero CO2 emissions by 2050, as mapped out in the Net Zero Emissions by 2050 (NZE) scenario, which is aligned with keeping long-term average global temperature rise to 1.5 degrees C with limited overshoot (with a 50% probability).

The power sector is leading the way for clean energy transitions, thanks to renewables and other low-emissions sources of electricity. Coal is currently the world's largest source of electricity, providing 36% of the total, but is projected to be soon surpassed by renewables and its share shrinks to less than 10% in 2050 in the STEPS. With fewer mature options of substitution, coal use decline in industry is less pronounced. Although efficiency gains, shifts in processes, and fuel switching – including electrification – help reduce consumption. Progress speeds up considerably in the NZE Scenario in both sectors, with global coal use decreasing by over 90% in 2050. Of the residual amount, over three-quarters is consumed in facilities equipped with carbon capture, utilisation and storage (CCUS) – capturing about 650 Mt CO2 in the power sector and 400 Mt CO2 in the industry sector, around 10% is used as a feedstock or in other non-energy use and the remainder is offset by direct air capture, negative emissions from bioenergy or other forms of carbon dioxide removal.

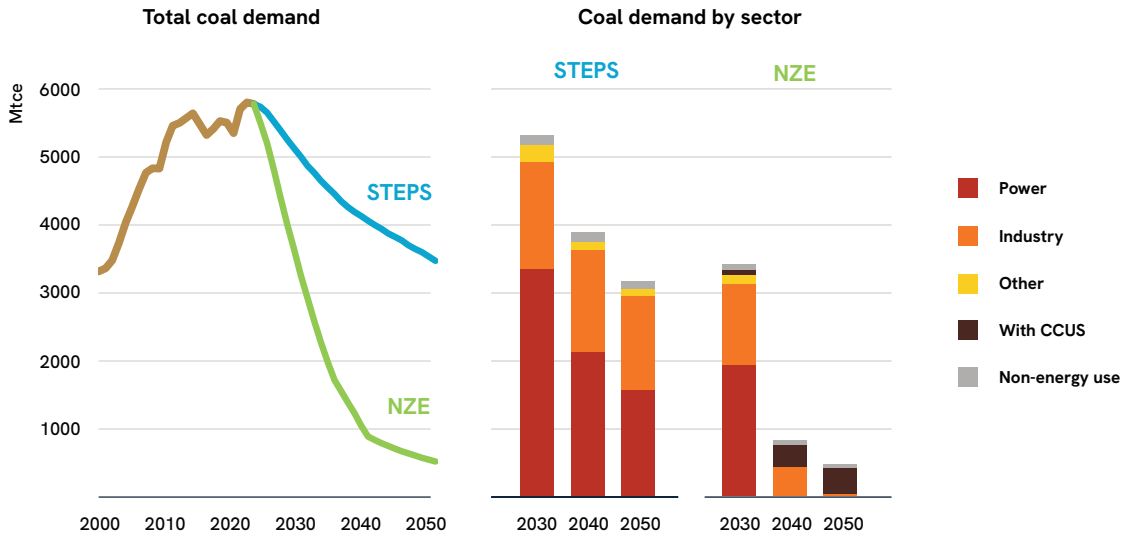


Figure 3: Coal demand outlook by scenario and sector, 2010-2050

Successfully transitioning away from unabated coal electricity depends heavily on the rapid expansion of alternative sources, along with the development of the necessary enabling infrastructure, including increasing energy storage by 6-fold to 1 500 GW in 2030 and adding or refurbishing 25 million km of transmission and distribution lines by then. In the NZE scenario, renewables capacity triples by 2030, while other low-emission electricity sources also expand, ensuring that no further unabated coal plants are built beyond those already under construction and a complete phase out of unabated coal power is achieved by 2040.

## 1.1 Levers for reducing emissions from existing coal power plants

While an immediate halt of approvals for new unabated coal-fired power plants is a key milestone to the pathway to 1.5°C, it is also imperative to address the challenges posed by the existing coal fleet. Today, the current global coal capacity stands at 2,245 gigawatts (GW), with more than 9,000 coal-fired units worldwide, almost half of which are less than 15 years old. g. Their long lifetime (around 40-50 years) means that unless action is taken, operating the current fleet of coal plants as in the past would emit 250 gigaton (Gt) of CO2 emissions over the period to 2050, exceeding the remaining budget to limit warming to 1.5°C (Figure 4).

Alongside expanding the supply of low-emissions energy, there are several key levers that can be applied to tackle emissions from existing coal-fired power plants fleet, including to:

- repurpose coal plants to focus on system adequacy or flexibility services is a way to reduce emissions while keeping plants operational. This approach allows coal plants to produce less electricity but remain available when system demands peak, contributing to power reliability and, in some cases with additional retrofits, supporting the integration of increasing shares of variable renewables. Coal plants can be run and/or retrofitted to run more flexibly, allowing them to ramp up or down more frequently, run at partial loads, and adjust output. Most coal plants could adopt this flexibility, requiring in many cases some equipment upgrades and capital investments, changes to plant operations, and adjustments to market designs or contracts. However, operational practices and contract structures, which prioritize constant output, can limit flexibility, and can result in overall larger maintenance costs and maintenance outages over the longer term.

- retire coal plants early, prior to the end of their technical lifetimes. As plants age, asset owners face decisions on whether to invest in refurbishments, choices largely driven by financial prospects. Beside these decision points, policymakers and financial institutions can influence and encourage early retirements. Retired coal plant sites provide potential for new uses like energy storage, synchronous condensers, or alternative energy generation hence maintaining a source of jobs. To ensure just transitions, coal plant retirements should address the needs of displaced workers, communities, and the environment. Tailored financial mechanisms are crucial for managing the transition and repurposing coal assets.
- retrofitting plants with CCUS also helps preserve existing assets, especially for young and large plants. The technology is currently applied in around 50 commercial facilities across sectors globally. Despite limited progress to date in adding CCUS to power plants, there are plans for around 80 new projects to be completed by 2030. If these announcements materialise, they could bring capture capacity from power plants to close to 90 Mt CO2 in 2030 – about half of the level needed in the NZE scenario. This is encouraging but the majority have yet to reach final investment decision and need further policy support to boost demand, improve economics, and facilitate new enabling infrastructure.
- retrofitting to co-fire with low-emissions fuels is another option to reduce emissions while keeping power plants operational. Biomass co-firing, a mature technology, can already reach over 50% blending in some cases, but depends on the availability and cost of sustainable biomass. New advancements allow co-firing ammonia with coal and the retrofitting for low blends requires relatively low upfront costs. However, fuel costs are high and the technology faces challenges with nitrogen oxides (NOx) emissions, which need to be managed as blending rates increase.

In the IEA NZE scenario, these measures collectively help reduce emissions by 160 gigatons over the period to 2050 (Figure 4). Retiring coal plants early represents about two-thirds of the total reductions, as over 100 GW of coal capacity is retired per year to 2030 globally, nearly 60% of which are in EMDEs. Repurposing coal-fired power plants to operate with more flexibility is the next largest element (close to a third of reductions), reducing cumulative emissions to 2050 by about 50 Gt. Retrofits with CCUS and the use of co-fired low-emissions fuels makes a much smaller contribution (approximately 5%).

China represents the majority of the emissions reductions from existing coal-fired power plants in the NZE Scenario (over 60% of global reductions), several times larger than any other country as it has by far the largest coal plant fleet in the world. Early retirements accounts for over 70% of the emissions reductions by 2050 and repurposing close to 25%.

Other EMDE – including India, Indonesia and other countries in Southeast Asia – represent more than 20% of the potential emissions reductions from existing coal-fired power plants. In these economies, clean energy investment needs to more than triple by 2030 to follow the NZE Scenario, a challenging task that calls for substantial growth in private sector financing. Early retirements and repurposing contribute each to around 45% of the emissions reductions by 2050.

Advanced economies, building on recent momentum could also accelerate actions and avoid about 40 Gt from existing coal-fired power plants compared to the pathway laid by today's policy settings. In the NZE scenario, advanced economies phase out unabated coal in the 2030s, 5 to 10 years earlier than the global 2040 milestone, the option of retiring coal-fired capacity before 50 years of operations is therefore also the largest contributor to emissions reduction (over two-thirds) despite a relatively older fleet on average and repurposing represents 20% of the reductions achieved.

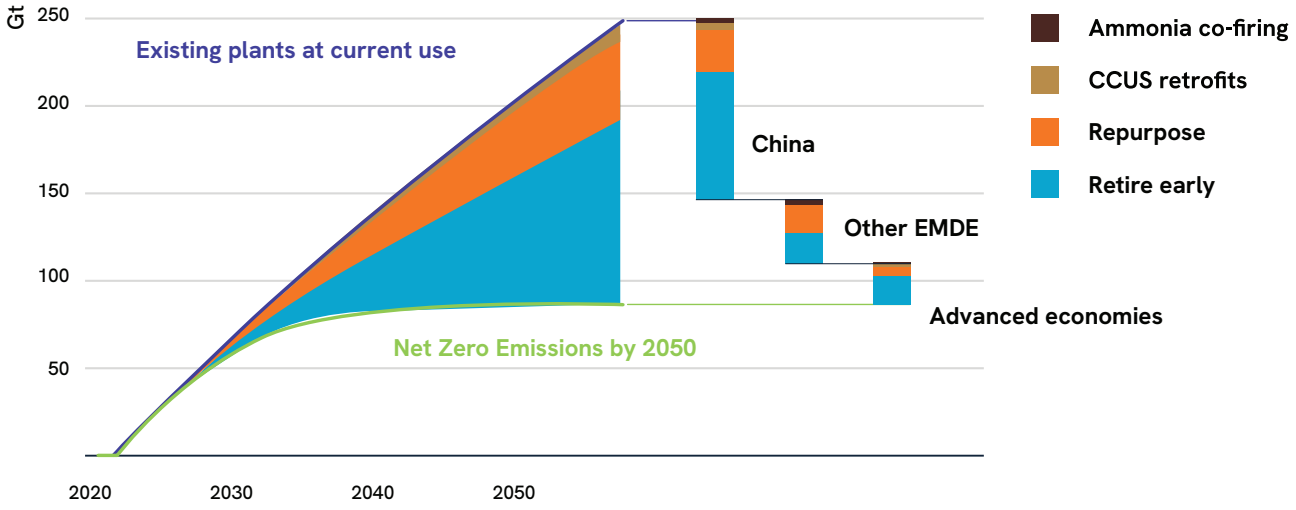


Figure 4: Global cumulative CO2 emissions from existing coal-fired power plants

# 02

# Policy measures to support a secure, affordable, accelerated transition from coal-to-clean power

**A successful coal-to-clean transition entails structural shifts in how we produce, move and consume electricity, while ensuring workers and communities are supported.** Coal power plants need to be replaced by clean sources of energy such as wind, solar and storage, as well as some low-emissions technologies depending on feasibility in various countries. The transmission and distribution grid needs expansion to connect renewables and facilitate electricity trade between different jurisdictions. As more renewables like solar and wind are integrated, grid operation must adapt to leverage their benefits and also manage the variability of these energy resources to ensure there is adequate supply of electricity to meet demand at all times. Analysis and planning is necessary to determine how power systems can transition while ensuring reliability and security of electricity supply, optimising electricity system operations, and minimising costs and emissions. In addition, the transition should be managed in a manner that ensures workers and communities benefit from the transition in terms of economic development, employment, affordability and energy access, and potential negative impacts are mitigated.

Addressing these changes requires sound policy measures, which will in turn affect the availability of finance. This chapter examines the policy measures needed, while the next chapter will examine how the necessary finance can be sourced.

**Coal-to-clean transitions create significant benefits but the road to transition can be challenging.** There are economic, health, energy security and affordability benefits to the transition. The International Monetary Fund (IMF) has estimated that, globally, every $1 invested in coal phase-out and renewables replacement globally can bring $3 in social and economic benefit.[4] The International Energy Agency (IEA) estimates that in most countries in the world, variable renewables are cheaper than coal-fired power plants.[5] There is also growing evidence that investing in the coal-to-clean energy transition generates economic growth, more clean energy jobs than those that are lost from coal transition, and that countries with higher proportions of clean energy generation with lower carbon grids will enjoy wider competitive advantages as industries globally look to decarbonise their supply chains, including in relation to trade.[6] Furthermore, the coal-to-clean transition will reduce air and water pollution and its negative impacts on health.[7]

However, the transition pathways vary significantly from country to country. And there are many real challenges for accelerating the process, particularly in EMDEs. Policy makers must ensure reliable and affordable electricity supply even as demand grows. They must also address the distributional impacts of the transition, which is particularly challenging in economies with high dependence on the coal industry. In countries with poor energy access or where the grid infrastructure is not extensive, even more investment is needed to build the necessary infrastructure. Institutional capacity to deliver the plans, policies and regulations may also not be adequate in some countries for the scale of the changes needed, especially when such capacity may already be overwhelmed with managing economic development and other issues. The design of policy solutions and provision support should be particularly mindful of these challenges.

**Ambitious and context-specific energy planning, policy and regulatory approaches help provide the certainty needed by industry, the finance sector and communities to ensure a reliable, affordable and equitable coal-to-clean transition.** Policy and regulation can send clear signals to industry, financial institutions and communities, and enable them to proactively plan such that solutions are effectively implemented to maintain/enhance reliability of electricity supply, to optimise costs, and to ensure measures are in place to support worker and community transitions. Choice and implementation of policy and regulatory measures will depend on national and regional realities including power market structures, government capacity, current state of power sector transition, availability of alternative, clean energy sources, and so on. These measures have to be context-specific and reflect the realities and challenges of the country.

## 2.1 Toolbox of power sector policy measures to enable accelerated coal transitions

An enabling policy environment should aim to achieve the following **fundamental outcomes for just and accelerated coal-to-clean transitions:**

- Address **economic and structural** implications of coal-to-clean transitions. For economies dependent on coal, these transitions involve significant economic considerations for workers, communities and consumers, as well as macro-level implications for government revenues, energy security and industrial strategy. Addressing these through just transition planning and equitable energy policies is essential for coal-to-clean transitions to be equitable and credible.
- Set a **clear, ambitious political and policy agenda** that provides strong signals with ample time to plan for industry, utilities, the finance sector and communities, which need to take practical steps to reduce generation from coal plants and invest in clean energy solutions.
- **Enable development and integration of cost-effective clean energy resources and disincentivise expensive carbon-intensive technologies,** while ensuring electricity reliability, affordability and access. Services provided by various energy sources – including coal – must be fairly evaluated and enumerated.

There is a broad toolbox available to governments to achieve the above outcomes, grouped into four categories below of commitments and targets, planning and procurement, regulation, and market rules and contracts. Governments may choose certain policy tools based on what is best suited for their market (as explained in section 2.2.), while also recognising that some of these may take much longer to be implemented in certain countries.

### 2.1.1 National- and state-level commitments and agenda-setting

Political commitments and targets at the government level send clear signals about the scale and timeline for the transition to power producers, developers, investors and consumers. These commitments and targets also function as accountability measures to ensure effective and equitable coal-to-clean transitions while avoiding new fossil fuel lock-in or emissions leakage. Targets can also be reflected in the plans and commitments of utilities and power producers.

Best practices include:

- **Commitments to immediately cease approvals and construction of unabated coal power,** such as moratoria on new coal power plant approvals, and halting public finance for new coal power plants. According to the Global Energy Monitor,[1] "As of January 2024, 101 countries have either formally committed to No New Coal or have abandoned any coal plans they had in the last decade."
- **A Coal power phaseout timelines** that are 1.5°C-aligned, as well as reflected in countries' updated Nationally Determined Contributions (NDCs), to guide long-term, country-led climate planning. For example, Panama has submitted its 2025 NDC[2] with a commitment to phase out coal by 2026.
- **Medium and long-term domestic targets for increased renewables capacity deployment and energy efficiency measures,** reflecting the COP28 commitment to triple global renewables capacity and double energy efficiency by 2030. For example, many US states have Renewable Portfolio Standards[3] that set targets for the proportion of electricity from renewable energy. In EMDEs this may look like a clear government target related to renewable energy auctions.
- **Clear political commitment to enabling and supporting a just transition,** made at the same time as establishing country-level targets and timelines for the coal-to-clean transition, and informed by International Labour Organization's Guidelines[4] for a just transition towards environmentally sustainable economies and societies for all. The transition plan should be communicated in advance to relevant parties, ensuring early engagement with affected communities, workers and unions.

### 2.1.2 Transition planning

Medium and long-term plans for broader power sector transformation – at the national or utility level – help deliver holistic, cost-effective and just coal-to-clean transitions, and can build government confidence that coal phase-out will support national economic and development objectives. Technology roadmaps, power sector and utility transition plans, and procurement planning must account for the needs of grid expansion and procuring alternative clean energy to replace coal capacity and ensure energy security.

- **Power sector transition plans developed through inter-ministerial collaboration and paired with fiscal plans,** such as through Integrated Resource Plans (IRP), which are comprehensive plans for the generation needed from various sources to meet the anticipated demand, for the power sector or for utilities, to guide targeted investment decisions without compromising energy security and affordability or locking in of new fossil fuel infrastructure. Plans require cross-governmental collaboration across several ministries including energy, environment, finance, labour, etc. as well as broad stakeholder consultation. They should outline deployment needs for energy resources and infrastructure, including transmission interconnections. Examples of ongoing power transition planning in major coal-producing countries include the Just Energy Transition Partnerships (JETPs) investment plans in South Africa, Indonesia and Vietnam.
- **Just transition plans** create supportive political conditions for the transition and will be particularly important in coal-producing countries. While the energy transition can deliver long-term net-benefits, clear plans are needed to ensure meaningful social and economic justice for workers, communities and regions negatively affected by the energy transition, in both the short, medium, and long term. These must be developed in consultation with affected communities, relevant workers, unions and employers. Best practice includes just transition planning at the national/regional, sector, entity/utility, and asset levels.

[1] Global Energy Monitor, Boom and Bust Coal 2024 report, 2024
[2] UNFCCC, Segunda Contribución Determinada a Nivel Nacional (CDN2), 2024
[3] U.S. Energy Information Administration, Renewable Portfolio Standards Explained, 2024
[4] International Labour Organization, Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All, 2024

Considerations should be made for all facets of socio-economic impacts and benefits, including improving economic development, equitable employment, energy access and affordability. Tools such as CIF ACT ReACT tool[5] and Just Transition Planning Toolbox[6] provide helpful guidance. A primary challenge in EMDEs has been financing the just transition plan and many of the mechanisms included in Chapter 3 can be designed in a manner that includes support for just transition efforts.

### *Box 1: South Africa's Just Energy Transition: the multi-stakeholder model gains momentum*

***In 2021, South Africa updated its Nationally Determined Contribution (NDC)*** *in terms of the United Nations Framework Convention on Climate Change (UNFCCC), committing to reach the greenhouse gas emissions range of 350-420 mega tons of C02 equivalent per annum by 2030. The country was clear that its transition from coal dependency must be just for all affected, and that the lower end of the emissions target range was contingent on securing international financial support. At COP26 in Glasgow, the US, UK, France, Germany and the EU undertook to "mobilise an initial amount of approximately $8.5 billion over the next three to five years…", in support of a Just Transition in South Africa.[1] While decarbonising the electricity sector was a crucial part of this JET Partnership undertaking, it included a focus on protecting vulnerable workers and communities, and the development of new economic opportunities in green hydrogen and electric vehicles. By the end of 2022, South Africa had developed its JET Investment Plan (JET IP), estimating that the transition would cost approximately $98 billion at 2021 prices.[2]*

*The advisory Presidential Climate Commission (PCC), representing the country's major constituencies, consulted widely with stakeholders on the JET IP in 2023, while the Office of the President established the JET Project Management Unit (JET PMU) to take the PCC's feedback on board, prepare the JET Implementation Plan and drive delivery. To date, more international partners have joined South Africa's JET journey, with international pledges (in concessional loans, grants and commercial finance) now standing at $11.8 billion.*

***South Africa's multi-stakeholder approach to the just transition has proven its capacity to identify lessons and shape its trajectory.*** *To date, these include (but are not limited to) the need for:*

- *Institutional capability to manage all aspects of the transition, including large-scale infrastructure, distribution systems for embedded power generation, and enabling affected communities and workers to own decisions on their sustainable future livelihoods.*
- *Preparation of project pipelines and their financing arrangements that ensure the efficient deployment of available capital at scale.*
- *Social protection programmes for formal and informal workers. Financing such measures in South Africa and other EMDEs is challenging.*
- *Coordinated retraining and skills development that responds to emerging employment opportunities.*

[5] Climate Investment Funds, Accelerating Coal Transition, 2024
[6] Climate Investment Funds, Just Transition Toolbox, 2024

- *Adequate community consultation far in advance of actual coal asset closures. The decommissioning of the Komati Power Station, funded through a $497 million World Bank loan that predated the JETP, is now regarded as a cautionary tale. A 2023 PCC study, Early Lessons and Recommendations from Komati's Decommissioning and Repurposing Project,[3] found that "informing the [affected] communities had been delayed, with no economic diversification efforts after the decommissioning, that there was a lack of meaningful consultation with the community... and that an intersectional approach was necessary, alongside significant financial support."[4]*
- *Adequate planning and financing sustainable closures or rehabilitation of assets - in some cases, communities and local governments have been left exposed to ecological and related risks in South Africa, most notably water safety.*
- *Economic diversification in the coal belt, which is difficult to advance under low economic growth conditions and where commercial and community projects are at different stages of readiness for investment.*
- *Deploying funding for the key enabler of grid infrastructure under restricted balance sheet borrowing capacity of the national utility Eskom, while systems are formalised to procure private investment in transmission - a lesson which may apply to other heavily indebted utilities.*
- *JET grant funding to effectively reach community-level projects and demonstrate their impact in the creation of new livelihoods. Too often, grant funds are spent on intermediary activities.*
- *Specific planning and resources to be allocated towards managing the transition in heavily coal-dependent areas (in South Africa's case, the province of Mpumalanga)*
- *Involving all spheres of government (local, provincial and national), the private sector, trade unions and civil society in managing the transition, cushioning its impact on communities, and supporting sustainable development outcomes.*

***The Just Transition Implementation Plan,*** *approved by the South African Cabinet in November 2023, responds to these and other challenges.[5] Key innovations include:*

- *An institutional architecture that assigns each of the six defined JET portfolios (Electricity, Mpumalanga, Municipalities, Skills, New Energy Vehicles, Green Hydrogen) to a lead institution of state, purposefully capacitated to manage a multi-stakeholder forum and defined workstreams to develop pipelines of investable projects per portfolio (see Figure 1). Accountability is to a JET Inter-Ministerial Committee of Cabinet.*
- *A plan to use both JET concessional financing and private capital for grid financing, managed by the recently unbundled National Transmission Company of South Africa.*
- *Flagship programmes to promote skills and training associated with three core value chains: renewable energy and transmission, new electric vehicles, and green hydrogen.*
- *Front-loading repowering and repurposing investments along with community development initiatives well ahead of the decommissioning dates at retiring coal power station sites.*

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[1] SA JETP, Political Declaration (2021)
[2] SA JET-IP (2022)
[3] PCC, Early Lessons from Komati's Decommissioning and Repurposing Project (2023)
[4] Daily Maverick, Komati Power Station — the cautionary tale of the Just Energy Transition and lessons to be learnt (2023)
[5] SA Just Energy Transition Implementation Plan (2023)

- *Encouraging potential for industrial growth in green hydrogen, new energy vehicles and the renewable energy value chains.*
- *Expanded JET capacity building and planning for municipalities, including for modernising electricity distribution systems and infrastructure, and improving energy access and affordability.*
- *Focusing on economic diversification and community development investments for a just transition in the coal belt of Mpumalanga.*
- *Establishing the JET Funding Platform that supports project preparation, matches credible JET projects to multiple potential sources of grant funding, publishes a transparent register of JET grants, and tracks their performance aimed at achieving optimal impact in affected communities.*

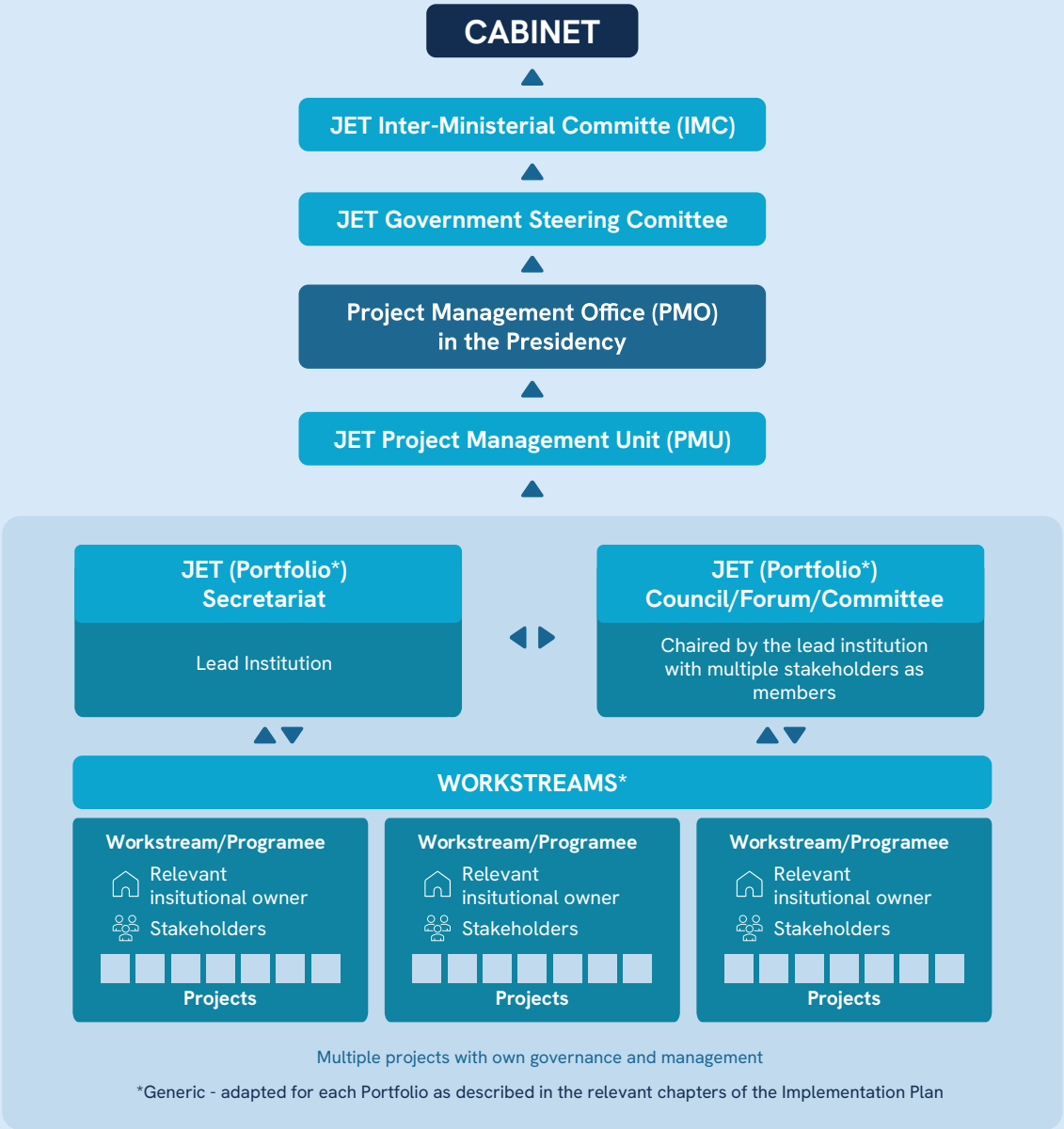



**Figure 1: South Africa's JET Implementation Plan: Governance and institutional architecture**

***South Africa's broader efforts to manage its energy crisis are starting to bear fruit,*** *with the country recently marking 200 days without rolling blackouts.[6] Policy makers remain acutely aware of the challenges ahead, particularly with respect to Eskom's precarious financial position, and the impacts of the transition on local communities and workers, as more coal plants are scheduled to come offline over the next decade. Over the next five years, the success of South Africa's strategy of multi-stakeholder collaboration, strengthened state institutions, private sector investment and international cooperation will be critical to deliver its just energy transition effectively.*

***Text compiled with inputs from the Presidential Climate Commission (PCC) and the Just Energy Transition Project Management Unit (JET PMU) in the Presidency***

[6] Eskom, 200 days without loadshedding (2023)

### 2.1.3 Electricity sector regulations and policies

Regulatory approaches can reflect and address the true costs of coal while creating a more level playing field for clean energy sources. Regulatory action can range from direct action (mandated closures of coal plants) to indirect action (pollution controls). Indirect actions often work to create an even playing field for renewable energy sources, however the efficacy of these measures depends on the market structures within a given jurisdiction and the different starting points of countries.

- **Mandated closures:** In some jurisdictions, the government may be able to issue direct edicts to close coal power plants by a given date. Consultation with utilities and communities is critical to ensure continued investment in new, clean power and mitigation of community impacts.
- **Emissions performance standards and regulation to control air pollutants** can be effective tools for reducing coal plant emissions and incentivising their early closures. Emissions performance standards set limits on greenhouse gas emissions, and are most effective when combined with other regulatory and policy measures that price out coal and ensure costs are not simply carried by consumers.
- **Carbon pricing mechanisms and emissions trading schemes** can help reflect the true cost of coal by addressing - at least in part - the social cost of carbon, and thereby creating a more level playing field for cleaner alternatives to coal. They have been used successfully in combination with other policies by governments such as the UK, Canada and Greece to reduce emissions from carbon-intensive power generation. Carbon pricing mechanisms are reliant on significant capacity for coordination, regulation and implementation by governments. Significant resources are also necessary for designing schemes and communicating to market participants with sufficient notice and clarity. Particular barriers to carbon pricing in Asia[7] include centralised, regulated energy systems, potential negative impacts on customers, and a lack of government capacity.
- **Removal of coal subsidies:** Subsidies for coal may have been originally introduced for various reasons including energy security and affordability, however they pass the costs of coal from governments or utilities to taxpayers and artificially shield coal power producers from competition with cheaper clean energy sources. Subsidy reform is an important step towards reflecting the true cost of coal in national balance sheets but brings political challenges.

[7] Asian Development Bank, Carbon Pricing for a Greener Future: Transition Challenges in Developing Asia, 2023

Policies must avoid exposing vulnerable consumers to increased costs. It is important to acknowledge that in some cases where existing assets are protected from change in law, this may have a lower impact on existing Independent Power Producers (IPPs), however the change may still bring important transparency to the cost of using coal for governments.

- **Measures to improve utility governance and accountability** enable efficient and effective functioning of utilities. These can include the use of monitoring information systems (MIS) and advanced metering systems; public and timely disclosure of data from MIS tools, audited financial statements and key performance metrics; and competitive appointments of staff and regular assessment of workforce training needs.

### 2.1.4 Market design and procurement

As with physical infrastructure, existing markets, contracts and regulations may have been designed around reliance on coal-fired generation. As power systems move away from coal and towards more diversified sources of clean energy, market design must evolve to meet the needs of the emerging power system. This includes creating incentives for valuable reliability services like capacity and flexibility, as well as creating a level playing field for new clean energy entrants to the market. Best practices include:

- **Government or utility procurement schemes for clean energy and grid infrastructure** can help with price discovery and with attracting developers to the market in jurisdictions where renewable energy deployment is still nascent. There are emerging best practices for competitive procurement of transmission infrastructure in areas where renewable resources are particularly high, such as the Competitive Renewable Energy Zones (CREZ) in the Philippines[8] and Texas, US[9] or accelerating general grid investment via private development of transmission which has attracted significant investment in India and Brazil.
- **Least-cost dispatch of assets:** Prioritising dispatch of facilities that produce power at the lowest cost (renewables have among the lowest operational costs) can help ensure that the market cost of electricity is low and competitive. Such measures may also include provisions to include the true cost of coal in dispatch decisions. Acknowledging that physical power purchase agreements with take-or-pay clauses may adversely affect the short-term cost of power production from the perspective of the system operator
- **Securing ancillary services and capacity:** Ancillary services include services beyond the simple provision of energy, such as black start capability (the ability to start when the entire grid is down) and frequency response (response to an unforeseen event within seconds to maintain grid stability). These services may be procured by vertically integrated utilities (VIUs, which own all components of the electricity supply chain: generation of power, transmission to move it across long distances and distribution to customers) or secured through competitive markets in fully or partially deregulated jurisdictions. Regardless of the mechanism used, its design should enable renewable energy and flexible resources (e.g., battery energy storage solutions, demand response) to participate fairly.

Some of these measures will require renegotiation of existing power purchase agreements and other contracts, explored in further detail in Chapter 3.

### *Box 2: UK's journey to a coal power phase-out*

*The UK's final coal-fired power plant, Ratcliffe-on-Soar in Nottinghamshire, ceased operations on 30 September 2024. This represents a genuine historical milestone, given coal's prominence in UK power generation.*

[8] National Renewable Energy Laboratory, Project Philippines: Transforming Energy Systems, 2024
[9] Power Up Texas, Transmission and CREZ Fact Sheet, 2018

*Coal has played a key role in the UK's historical power mix, providing around 95% of all electricity in the 1940s. Even as recently as 2012, coal use represented around 40% of electricity production. Within 12 years, this was less than 1% and is now 0%. In fact, this final power plant was closed a year earlier than the original 2025 target set by government to phase out coal power in Great Britain. The pace of this coal power phase-out has been recognised internationally.*[1]

*Alongside phasing out coal power, the UK has also taken steps to encourage rapid growth in renewable generation. Since 2010 renewables have increased from just 7% of electricity supply to over 50% in early 2024. 99% of the UK's solar capacity has been installed since 2010 – enough to power the equivalent of over 4.5 million homes – and has reached 16.7GW of installed solar. This represents a successful, rapid transition from coal to clean.*

*Some of the key steps the UK took to enable this include:*

- *The introduction in 2013 of a Carbon Price Floor (CPF), imposing a tax on energy generators using fossil fuels to generate capacity. It consists of two components: (i) the EU Emissions Trading System (ETS) price, and (ii) the Carbon Price Support mechanism (CPS), which tops up the EU ETS allowance price as projected by the UK government to the CPF target. The CPF was frozen at a maximum of £18/tCO2 from 2016 to 2020 to limit the competitive disadvantage faced by business and to reduce energy bills for consumers.*
- *The introduction of UK Contracts for Difference (CfDs) in 2014 to boost investment in renewable energy by providing the developers of projects that have high upfront costs and long lifetimes with direct protection from volatile wholesale electricity prices. CfDs also protect consumers by paying back when electricity prices are high.*

*These measures resulted in rapid market-driven accelerated retirement of coal plants, as the plant owners responded to the poor economics of coal power by shutting down their coal assets and investing in clean energy.*

*To continue to deliver an accelerated energy transition, the UK is committed to deliver a fully decarbonised power sector by 2030. This will involve speeding up deployment of all clean and renewable technologies including hydrogen, solar, carbon capture and storage, and wind.*

***Text provided by the Department for Energy Security and Net Zero (UK)***

[1] Source: WRI

## 2.2 Tailloring policies to country and market contexts

The commitments, planning efforts, and policy measures outlined in the previous section will need to be adapted to different market and utility ownership structures. This section offers guidance on effective policies across a wide spectrum of market liberalisation and ownership models by using three broad jurisdictional 'archetypes' to illustrate different market contexts. As shown in the figure below, most commitments and planning measures are applicable in all jurisdictions. Regulations, market design and procurement measures may vary in effectiveness across different markets.

| | Commitments and targets | Transition planning | Regulations and policies | Market design and procurement |
|---|---|---|---|---|
| All mar kets | Political commitments to:<br>• build no new coal;<br>• phase out existing coal;<br>• increase renewables and energy efficiency | • Comprehensive cross-ministerial power sector transition plan with fiscal plan<br>• Just energy transition plan | • Emissions standards and pollution regulation<br>• Coal subsidy reform | • Procurement auctions for clean energy if nascent |
| Deregulated Mar kets | Long term carbon pricing certainty | • Grid infrastructure planning with transmission and distribution utilities | • Carbon pricing | • Ancillary services and capacity markets |
| Single-buy er Mar kets | Long term carbon pricing certainty | • Integrated resource plan<br>• Centralised grid infrastructure plan | • Carbon pricing | • Low-cost dispatch<br>• Ancillary services and capacity procurement |
| Vertically Integrated Utilities | Utility commitments to:<br>• build no new coal;<br>• phase out existing coal;<br>• increase renewables and energy efficiency | • Integrated resource plan<br>• Centralised grid infrastructure plan | • Regulated closures with mitigation measures | • Low-cost dispatch |

Table 1: Most effective policy measures accross jurisdictional archetypes

### 2.2.1 Deregulated markets

**Description:** Deregulated markets are competitive wholesale markets, whereby independent power producers sell all the generation from their power plants into the wholesale market where it can be bought by many different buyers. Transmission and distribution are normally regulated due to infrastructure cost and complexity. There is no central planning. There may be long-term contracts (Power Purchase Agreements or PPAs) between a power producer and a customer (offtaker) which guarantee a certain revenue for the amount of energy to be supplied for a specified period of time. Singapore was Asia's first deregulated market when it opened its wholesale market in January 2003, and it completed deregulation of its retail market in 2018.[9]

**Challenges:** Among the broader power system and political challenges, these markets can also be impacted by lack of policy certainty without strong coal transition plans from governments, and by energy security concerns as system operators try to forecast how alternatives to coal will enter the market. For power producers without PPAs, lack of revenue certainty from the market can increase the cost of capital for investments in new generation, however this can be mitigated by well-functioning derivatives markets.

**Specific policy measure considerations:** Where long-term PPAs do not dominate the market, measures that impact the price of electricity (e.g. carbon pricing) and revenues for the independent power producers (IPP) (e.g. ancillary services and spot markets) can effectively impact the investments in and dispatch of different energy sources. These measures can also have an impact on the PPA offtakers. Long-term certainty of these policies (e.g. clear step changes in carbon prices or allocations) is critical to maintaining investor confidence. Also, infrastructure may have to be planned with transmission and distribution utilities/facility owners.

### 2.2.2 Single-buyer markets

**Description:** These are centrally planned markets where a single entity (usually a state-owned utility) purchases power from a combination of its own assets and IPPs. In this market context, IPPs are often locked into long-term PPAs with take-or-pay clauses. Examples include Malaysia, Thailand and Pakistan.

**Challenges:** There are often not enough market incentives for clean energy to displace existing assets. The long-term contracts and asymmetry in market knowledge create unfair advantages to existing coal power plants over new clean energy sources. If the purchaser of electricity in the PPA is a publicly-owned single buyer, this means that taxpayers shoulder the costs of the PPAs and any potential PPA renegotiation costs. Depending on how they function and how and whether they manage retail (sale of power to consumers) and generation together, power producers may or may not be able to directly pass costs on to consumers.

**Specific policy measure considerations:** The effectiveness of market measures, as above, can be undone by actions which provide conflicting signals (e.g. procurement of new coal) or by resource plans and procurement targets which provide conflicting directions. If there is substantial IPP coal capacity, centralised procurement targets and auctions can be effective tools.

### 2.2.3 Vertically-integrated utility markets

**Description:** These are centrally planned markets with VIUs (i.e. ownership of generation, transmission and distribution). The VIUs historically owned all or the majority of the generation in the market, however in more recent developments also procure power from IPPs. A central authority like the system operator develops resource plans, which determine the generation mix and the investment needs. The VIUs decide which assets to tender out and which to develop alone. Returns are determined for the IPPs typically through the PPA and the return for the VIUs' own assets are typically regulated through rates (i.e. the price of electricity for consumers). Examples include South Africa and Indonesia.

**Challenges:** Regulated tariffs often mean the costs of coal can be passed on, dampening incentives to transition from coal-to-clean – even if clean is cheaper. Often, some measures need to be allowed for utilities to recover the capital they have already invested in order to ensure financial sustainability/creditworthiness of utilities. This is needed so that utilities are then able to raise significant capital for the transition. For the IPPs the PPAs typically have pass through and take-or-pay arrangements, which means any underutilised assets would financially impact the VIU.

**Specific policy measure considerations:** Governments here can give formal directives to influence utility mandates and can centrally plan for clean energy procurement, allowing a systemic approach to power sector transformation. Strengthening the financial health of VIUs is critical for enabling large-scale investments in the transition. Ratepayers in these markets are often protected from the true cost of coal, with taxpayers bearing the cost and risks. The transition hence must be navigated carefully to ensure electricity is affordable to consumers.

## Recommendations

**To support the effective use of levers like early retirement and repurposing coal plants for flexibility at a greater scale, governments will need to pursue key enabling policy measures informed by their national circumstances.** These include:

- political commitments to build no new coal and timelines for phasing out existing coal
- comprehensive power sector transition planning and implementation
- development of ambitious just energy transition plans informed by local consultation
- regulation to account for air pollution impacts and incorporate the social cost of carbon
- removal of subsidies from coal while making clean energy available

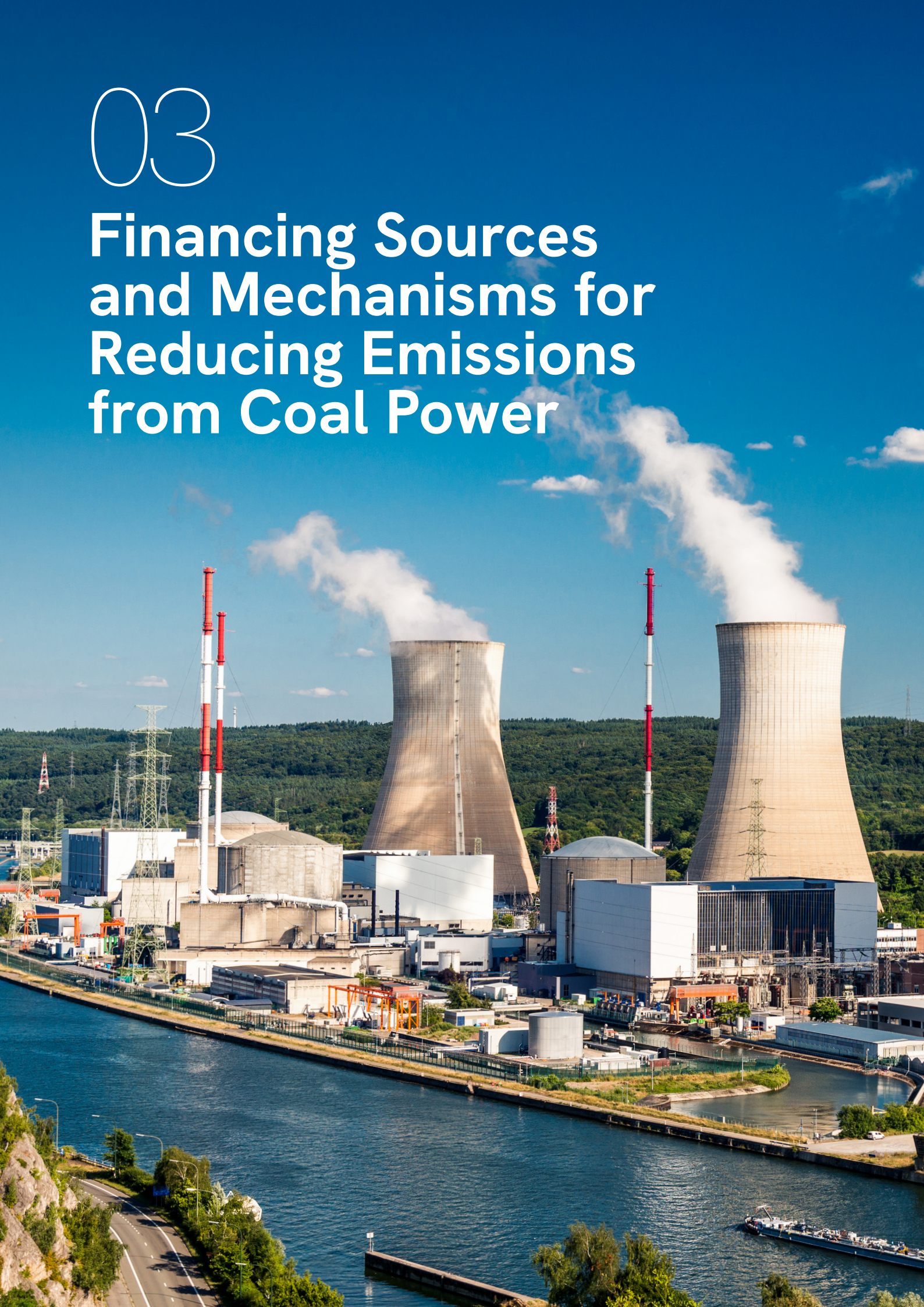
It is recognised that in pursuing these measures the distributional costs and other challenges of an orderly and affordable energy transition will need to be considered.

For many EMDEs, there will be a need for additional technical assistance to support various analyses, capacity to design policies and regulations, and planning activities (such as Clean Energy Transition Partnership, and various bilateral government initiatives and secondments) and the ability to leverage platforms to share best practices (such as Green Grids Initiative, Global Power Sector Transformation consortium, and Regulatory Energy Transition Accelerator).

National governments should develop just energy transition plans informed by local consultations and ILO guidelines. All partners in coal-to-clean transitions should look to ensure that the question of how to deliver a just transition is addressed in all coal-to-clean transition activities that they support and finance. There are increasing examples of best practice around how to involve workers, unions and communities in planning for a just transition. By drawing on this guidance and working with affected groups to develop plans for the transition governments and supporting partners can help protect and promote the interests of workers and communities.

# 03

# Financing Sources and Mechanisms for Reducing Emissions from Coal Power



**This chapter addresses key considerations for policy makers and other stakeholders in addressing the costs and financing needs associated with accelerated reductions of emissions from CFPPs.** As covered earlier in the report, coal-to-clean transitions require finance for replacement energy and grid as well as to reduce emissions from existing CFPPs, while supporting a just transition for workers and communities. This chapter focuses on the specific challenge of finance for reducing emissions from existing CFPPs, as securing investment for this aspect of the transition can be particularly challenging. Many of the examples here refer specifically to financing early retirement – the lever the IEA identifies will be most important for achieving climate goals globally – because there are real-life case studies from which to draw lessons and detailed financial sector guidance has been issued. Some financing approaches identified may be applicable to other levers, including repurposing for flexibility, with additional guardrails or specifications requiring further research.

## 3.1 How to assess the costs of coal transition for EMDEs?

**Assessing the costs of reducing emissions from coal power plants is challenging. While some estimates cover the overall costs of the coal-to-clean transition, very few seek to disentangle the costs of reducing emissions from CFPPs.** According to the IEA, EMDEs outside of China will need up to a seven-fold increase in investment to between USD 1.4-1.9 trillion per annum in clean energy by 2030.[2] The IEA and IFC also suggest that roughly two-thirds of this figure will need to be sourced from the private sector, and that public finance should ideally be deployed catalytically where some public risk mitigation is needed. We remain long away from hitting the 2030 annual goal as the IEA's most recent estimates suggest that between 2015 and 2022, finance to EMDEs outside China flatlined at roughly $260bn a year.[3]

**However, these aggregate figures mask the significant challenges in disentangling the specific costs of applying the four IEA levers to reduce emissions from coal power specifically.** Isolating the costs of retiring, flexing or retrofitting CFPPs is important, as these transactions have proven difficult to finance in practice. This is due to several factors, including the challenging economics of providing finance to a sector in decline and where the focus is on financing solutions that deliver emissions reductions which should not extend and likely imply lower lifetime usage of an existing asset, and the regulatory or reputational risks of providing any financing to coal, even when it is intended to reduce emissions.

**There are two broad classes of modelling that have attempted to assess the overall financing needs for reducing emissions from existing CFPPs,** as distinct from the broader coal-to-clean transition:

- **Top down approaches:** These typically rely on the outputs of regional or global cost-optimising energy models, which seek to deliver least-cost power sector expansion pathways constrained by emission targets, or alternatively generalise to regions or the world from detailed country-level cost analysis.
  - **Advantages:** these methods allow for easier generalisation across countries, and allow policy makers and others to assess the scale of the global challenge of financing the reduction of emissions from existing CFPPs.
  - **Drawbacks:** these estimates lack country-specificity by construction and may not be able to incorporate structural elements of jurisdictional power markets - for example, whether CFPPs are shielded from cost competition by long-term PPAs.

[2] IEA and IFC, Scaling Private Finance for Clean Energy in Emerging Market and Developing Economies, 2023
[3] IEA and IFC, Scaling Private Finance for Clean Energy in Emerging Market and Developing Economies, 2023

- **Bottom-up approaches:** These are typically conducted at the country-level, either through specifically tailored energy models, or using granular cost and investment data, including from individual CFPPs.
  - **Advantages:** these models allow for specifics of market regulation and PPAs to be captured in cost estimates.
  - **Drawbacks:** only a few countries have estimated these costs and relationships may not hold if the results are generalised to regions or the world.

**Table 2 below summarises available modelling results from both approaches for illustrative purposes given the limitations noted above.**

| Top-down approaches | | |
|---|---|---|
| **IEA, Accelerating just transitions for the coal sector (2024)[4]** | **ETC, Financing the Transition (2021)[5]** | **IMF, The great carbon arbitrage (2022)[6]** |
| **Non-China EMDEs require $60bn p/a between 2022 and 2030** to reduce emissions from coal power, under the IEA's Announced Policies Scenario (APS).<br><br>**Up to $1 trillion of unrecovered investments** tied up in CFPPs, o/w **$350bn in non-China EMDEs.** | **Non-China EMDEs require $25 to $50bn p/a between 2022 and 2030** to finance early coal retirement, drawn from concessional sources or grant payments. | **Foregone profits of early retirement are $50bn** consistent with the IEA NZE scenario relative to current policies.[7] |
| *Based on IEA energy model and does not consider possible impacts of competition-shielding PPAs or assume asset-owner compensation. Estimated numbers would likely be higher under the Net Zero Scenario (NZE).* | *Estimate is based on detailed analysis of the South African power system by the Blended Finance Taskforce, scaled to other EMDEs using South Africa's relative share of coal power capacity.[8]* | *Opportunity cost figure assumes constant profit per tonne of coal output, at $0.34/t, which is applied to the difference in coal output between the APS and NZE scenario.[9] Figure is global and does not include asset owner compensation.* |

| COUNTRY-SPECIFIC ESTIMATES | | |
|---|---|---|
| **Indonesia** | **South Africa** | **Philippines** |
| **Per Transition Zero: $37 billion in total or $1.2 million/MW** to buy out the PPAs to early retire Indonesia's existing coal fleet for a 1.5°C trajectory.<br><br>**Indonesia JETP Comprehensive Investment and Policy Plan (CIPP): $2.3bn to early retire 1.7GW by 2030,** otherwise flexible utilization of the coal fleet to bring down emissions and early retirement from 2045 to 2050. | **Blended Finance Taskforce: $24 billion drawn from largely concessional sources,** to retire CFPPs owned by Eskom for a 1.5°C trajectory.<br><br>**South Africa JET-IP: ZAR $23.4bn ($1.6bn at 2021 prices)** for decommissioning ESKOM assets at existing schedule (not necessarily 1.5 °C). | **Transition Zero:** $10.6bn to buy out existing PPAs retiring all CFPPs a maximum five years ahead of schedule. |

Table 2 - Approaches to modelling the costs of coal transition

[4] IEA, Accelerating just transitions for the coal sector, 2024
[5] Energy Transitions Commission, Financing the Transition, 2022
[6] IMF, The great carbon arbitrage, 2022
[7] Opportunity costs associated with coal transition are considered to be a small portion of the overall costs of replacing the coal fleet with renewables, which is modelled to be roughly $29tn between 2022 and 2100. However, using an estimate of the social cost of carbon set at ~$80/t, the paper concludes a significant net benefit to replacing the coal fleet with renewables (at roughly $85tn over the same period).
[8] Blended Finance Taskforce, Making Capital Work, 2022
[9] Based on the median unit coal profit, averaged over [2010-2020], of the top-10 coal companies by 2020 coal production, sourced from Asset Resolution data.

**There is clearly some variation in the way the top-down estimates are produced, and scope through time to improve approaches to ensure they capture all relevant costs without overstating them, to make them more comparable.** There are differences in terms of how far the estimates address the specific costs of applying the different policy levers identified by the IEA and whether the estimates seek to address wider costs associated with cleaning up the site, addressing just transition considerations, and replacement energy and related grid investment. In the end, however, establishing accurate estimates of the costs of coal transition will rely on governments and other stakeholders conducting more bottom-up studies at the jurisdictional level. As set out in Chapter 2, it will be beneficial for governments and state-owned energy operators to carry out transition planning for the energy sector they oversee. As part of that they must review their coal fleets to identify ways to reduce emissions and the specific opportunities and challenges faced, and in so doing to estimate the overall costs and financing needs. Such estimates are particularly important in markets where longer-term PPAs, and other political economy constraints such as the needs of coal-dependent communities, create additional costs which cannot be captured in global or regional cost-optimising energy models.

The box below, provided by the World Economic Forum, considers in more detail some of the costs and benefits of retirement that governments and state-owned energy operators could consider in calculating more accurate estimates.

### *Box 3: Early Retirement of a Coal-Fired Power Plant (CFPP): Costs and Benefits*

*Early retirement of coal-fired power plants (CFPPs) requires consideration of a complex interplay of costs and benefits. This may need to be acceptable to asset owners, depending on the contractual protections they enjoy, assure sovereign entities that removing a CFPP from the grid will avoid negative impacts on system security and affordability, and provide national governments with viable plans to support local communities and workers for a just transition.*

*Arrival at a balanced settlement requires nuanced cost-benefit analyses which assess implications of CFPP retirement at the level of the transaction itself, the energy system and the local and macro-economy. Assessing how CFPP usage options play out across different climate and energy scenarios can help stakeholders assess implications of retirement against their own priorities.*

*Key considerations at* ***the asset level*** *are shaped by an increasingly uncertain revenue outlook in the context of an accelerating energy transition. Monetising CFPP value early through early retirement thus becomes an option to hedge against risks of stranded assets and diminishing revenues. Where assets are relatively young and shielded from price competition by long-term PPAs, there will be costs associated with compensating asset owners for foregone future cashflows. Other potential negative impacts on cashflow of an early retirement transaction include costs of decommissioning the plant, removing hazardous waste and environmental clean-up, fees for breaking power purchase contracts, and supporting workers and communities to adapt, in accordance with the principle of a just transition. Conversely, there are positive cashflow rationales for retirement, including avoiding government carbon tax burden, avoiding future CAPEX for plant maintenance, recovering value from CFPP equipment or revenue from newly-available land, and a greater access to capital to finance the asset owner's wider business (excluding coal). These positive impacts do not include the benefits to society from reduced air pollution and health burden.*

***At a system level,*** *cashflow factors are different. There are major investment requirements to transition a system from coal to renewables as the dominant fuel source, for example in grid connections, renewable intermittency adaptation or installing battery storage. Also, failing to replace coal with lower-cost renewables may lead to higher energy costs for consumers. Again, however, these costs must be balanced with system-wide benefits of retirement, including potential government savings on costly fossil fuel subsidies, avoiding financial risks like trade and competitiveness lag to do with retaining a carbon-intensive business model, major public health benefits, and access to renewable-related credit (e.g. green bonds, transition credit revenue and ESG investor interest).*

**Text provided by the World Economic Forum**

**As WEF note in Box 3, some measure of compensation may be necessary to break contracts shielding assets from long-term competition**, or potentially to compensate for future foregone revenues. This is a very significant issue for many of the CFPPs in the Asia-Pacific region, where coal fleets are often young and subject to long-term PPAs. Box 4 elaborates on these constraints in more detail, and emphasises the need for alternative revenue streams to address them.

## *Box 4: What is the valuation gap and how can it be addressed?*

*As the above section on costs has made clear, there is a potentially significant capital pool tied up in coal assets that may need to be at least partially recouped. It may be feasible in some cases to impose losses on asset owners, and owners may be willing to accept 'haircuts' to expected returns where future revenues are less certain. However, many EMDE governments face the challenge that asset owners are protected by long-term PPAs that sometimes have decades to run, which guarantee payments if the use of the asset is reduced or curtailed. In these cases, addressing emissions can imply renegotiating the PPAs and reprofiling the finance, and may mean that asset owners insist on recouping all or a portion of the value that they would otherwise receive. The scale of these costs can be estimated by modelling to explore the lost economic value or 'valuation gap' that asset owners with guaranteed payments would likely be unwilling to voluntarily relinquish.*

*To understand why the valuation gap is important, it is useful to consider how the future cash flows of an illustrative CFPP would be affected by different early retirement dates. Consider, strictly for illustrative purposes, the case of a 500MW CFPP, with a 40-year lifespan, set to retire at the end of 2048, with guaranteed revenues to asset owners (through a PPA) of ~$60/Mwh throughout the lifetime of the asset. Applying an 8% discount rate and other modelling assumptions,[10] the figure below plots the discounted expected cash flows from 2025 to the end of its economic life, as well as showing a potential early retirement date at the end of 2033. The shaded area sums to the total discounted foregone cash flows if the plant is retired at the end of 2033 - in this case, $121m.*

[10] Key modelling assumptions sourced from BNEF, Transition Zero, GFANZ Secretariat: Plant capacity is 500MW, Initial Load Factor is 60%, Load factor escalation is 1% p.a., Emissions intensity is 1.6 tCO2e/MWh, Age adjusted efficiency is 33%, Revenue per Mwh (guaranteed) is 61.55 $/Mwh, Average fuel cost is 5.17 $/Mwh, Fixed O&M is .13 $/Mwh, Expected plant life is 40 years, Plant start date is 2009, Effective tax rate is 20.8% (OECD), Discount rate is 8%.

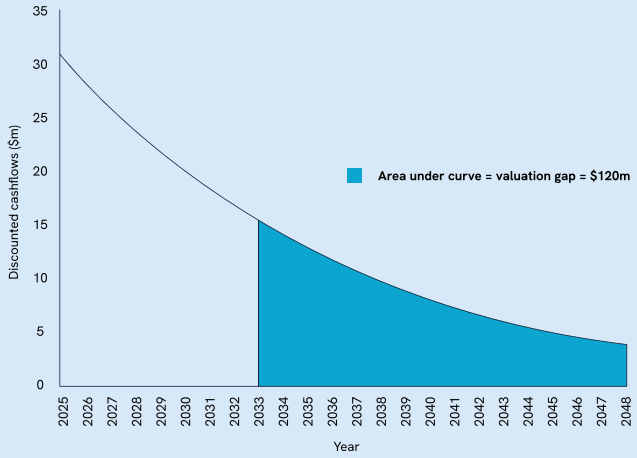



Figure - Illustrative valuation gap for CFPP retired 15 years early

***Although the illustration above relates to early retirement, a similar problem of foregone cash flows may exist if other levers like repurposing are applied, particularly where long-term PPAs exist.*** *Alternative revenue streams may be necessary to address the valuation gap where haircuts are impossible. These are explored in more detail in the sections below, on possible financing approaches for reducing emissions from CFPPs.*

***Text provided by GFANZ Secretariat***

## 3.2 What types of finance could support reducing emissions from CFPPs?

**There are a very small set of coal transition transactions from which to draw lessons on which types of finance could best support reducing emissions from CFPPs - and these relate almost exclusively to closing plants, in some cases earlier than their contractual lives.** Table 3 summarises how existing transactions have leveraged public, private and blended capital towards supporting coal-to-clean transitions, and what lessons for the scalability of different approaches can be drawn. While most of these transactions relate to closing plants including some early retirement, some of their structures may be applicable to retrofitting and repurposing, potentially with additional guardrails. Further in-depth research is needed on which financial structures and enabling policy conditions could finance these levers at scale in EMDEs, as noted by Recommendation 1.

| Summary | Scalability considerations |
|---|---|
| **Public finance examples** | |
| **Komati, Mpumalanga, South Africa** | |
| • SoE Eskom ~$500m from World Bank<br>• Mostly concessional<br>• Finance to decommission and repurpose the plant (56 years old)<br>• Repurposing with 50 MW solar PV, 70 MW wind and 150 MW battery storage[11] | • 3 public finance institutions (the World Bank Group, the Canadian Clean Energy and Forest Facility and ESMAP)<br>• Concerns on community consultation and just considerations slowed progress<br>• Limited solar and wind resources on the site[12] |
| **German coal auctions** | |
| • The German Coal Exit Act of 2020<br>• Voluntary exit between 2020 and 2026<br>• Auctions held to determine compensation<br>• By 2038, all plants need to retire and no compensation after 2027 for mandated plants[13] | • Requires state capacity to host auctions[14]<br>• Reliant on use of taxpayer money which may prove difficult in EMDEs with limited fiscal space |
| **Blended finance examples** | |
| **Topocilla, Chile** | |
| • In 2021 IDB and Engie financed 151 MW of wind<br>• Incentivized the early retirement of two units in Tocopilla coal plant<br>• USD 110 million at commercial rates and USD 15 million at concessional rates<br>• Concessionality tied to emission reductions[15] | • Results-based financing model may not be replicable<br>• Good credit rating was a key enabler<br>• Technical capacity to verify and monitor emission reductions is needed for scale |
| **Cirebon, Indonesia** | |
| • Lead arranger ADB is deploying CIF ACT funds, its own finance and also mobilizing commercial capital<br>• Early retirement transaction of 600 MW CFPP bringing forward closure by 7 years relative to PPAs | • Blended finance is used with public finance meeting some costs and lowering financing rates<br>• Early retirement is included in the Indonesian JETP CIPP |
| **Private finance examples** | |
| **SLTEC, Philippines** | |
| • ACEN announced a USD 314 million deal to divest from the SLTEC plant to enable closure by 2040<br>• Achieved by refinancing in a Special Purpose Vehicle<br>• Also a participant in pilot on transition credits through which they hope to bring closure forward to 2030 [see box 7 below] | • First transaction to use entirely private capital<br>• Leveraged a deep and sophisticated financial sector |
| **Pleasant Prairie, Wisconsin, USA** | |
| • Plant retired with significant uncovered costs<br>• To protect ratepayers from the costs, the coal asset was securitized with a bond with much lower interest rate (2.5%) than the previous equity obligations (9.5%)<br>• Projected savings of USD 40 million over 15 years to ratepayers[16] | • Securitisation may not be replicable outside sophisticated financial markets<br>• Transaction still involved some cost pass-through to consumers |

Table 3 – Transaction examples to reduce emissions from CFPPs

[11] Institute for New Economic Thinking, Research shows that auctions can help phase out coal while minimising taxpayer burden, 2024
[12] Bloomberg, How South Africa botched its first coal power-plant transition, 2023.
[13] Institute for New Economic Thinking, Research shows that auctions can help phase out coal while minimising taxpayer burden, 2024
[14] Renewables Now, Chile cuts 2023 power auction volume after demand recalculation, 2023.
[15] RMI, Transition Finance Case Studies, 2024.
[16] RMI, Securitization in Action, 2021

The transactions considered in the table use public, blended and private finance, and so next the availability of these types of finance to support use of the IEA's coal policy levers is considered.

### 3.2.1 Public finance

**Public sources of finance for reducing emissions from CFPPs include all capital that can be traced back to taxpayers, rather than the private sector.** This could include domestic public spending in EMDEs, either deployed directly by national or local governments, or channelled through state-owned enterprises (SOEs). However, this category also includes public money from donor governments, often (although not exclusively) channelled through MDBs. These instruments can additionally be disbursed as debt, equity or grant finance. Historically, debt at concessional rates has been the largest share.

**Public money has much greater practical potential to cover costs and bear losses than commercial investments, which seeks a positive return, but is clearly in short supply so needs to be used judiciously and catalytically.** Per the case studies, some governments have made public finance available to create incentives for, and meet the costs of, use of coal policy levers. That is feasible in EMDEs to a point, although many EMDE governments are fiscally constrained, and a series of crises in recent decades (including from extreme weather events) have seen national debt rise markedly.[17] This limits the capacity of EMDEs to fund coal transitions on sovereign or SOE balance sheets.

**Some international support is needed for coal-to-clean transitions and some such finance has been made available to catalyse change.** The Energy Transitions Commission estimates that roughly half of coal transition finance will need to be drawn from concessional capital sources[18] and the World Resources Institute have repeatedly called for greater sums of concessional capital to be deployed to coal transition.[19] The finance that is available presently is small but playing an important role in supporting a number of countries and other stakeholders seeking to make progress on coal-to-clean transitions. The Climate Investment Funds Accelerating Coal Transitions (CIF-ACT) presently makes available some $2bn in catalytic donor finance, which countries can apply to draw on, with the support for developing transactions – and sometimes some additional concessional finance - then being provided by MDBs. The role of the CIF ACT is explored in box 5 below and the experience of the ADB in deploying the funds is explored in Box 6. As the number of countries seeking to make progress, and the pipeline of specific transactions, grows, there would be a need for donor countries to increase the pool of public finance available for coal transitions in EMDEs and to consider how to ensure it is impactful, including by catalysing financing from other sources including the private sector.

#### *Box 5: The Climate Investment Funds Accelerate Coal Transition Programme (CIF ACT)*

*Launched at COP26, the CIF's Accelerating Coal Transition (ACT) investment programme is the first dedicated finance facility in the world, specifically designed to reduce emissions from coal-fired power plants (CFPPs). It was initially resourced at more than $2bn of concessional capital to facilitate the coal-to-clean transition in EMDEs. ACT Investment Plans are being developed and executed by Indonesia, South Africa, North Macedonia, the Philippines and the Dominican Republic.*

[17] Reuters, IMF increasingly worried about 'material effects' of climate change, 2023
[18] Energy Transitions Commission, Financing the Transition, 2022
[19] WRI, Financing Early Coal Retirement, 2023

*Indonesia has been an early recipient of CIF ACT funds to reduce emissions from their fleet of CFPPs. The Asian Development Bank (ADB) is currently working alongside the Indonesian government to use ACT resources to facilitate the early retirement of up to 1 GW of private CFPP assets. The proposed approach aims to facilitate private sector participation in the early retirement of CFPPs in Indonesia by using senior or subordinated concessional debt to shorten Power Purchase Agreements (PPAs) of Independent Power Producers (IPPs) while maintaining net present value (NPV) neutrality (i.e. ensuring that the early retirement does not result in any loss or gain for the related IPPs). These would be the first early retirement pilots in the country for private coal assets.*

*With cheaper debt and upfront compensation for tail-end returns, IPP developers can operate their CFPP investments for a shorter period in a commercially sustainable manner. If proven, the return-neutral model would provide encouragement for more voluntary CFPP early retirements by IPPs. By proposing fixed rate lending, it is still possible to provide substantial subsidies while reserving capital preservation for donors compared to existing commercial rates.*

*At the end of the shortened PPAs, the CFPP private owners and operators would then be contractually obligated to permanently terminate coal-fired operations and decommission or repurpose the assets in favour of low-carbon power generation (excluding natural gas).*

*Through the demonstration of IPP early retirement structures these efforts aim to support:*

- *Indonesia's adoption and implementation of policies and strategies for a coal-to-clean transition*
- *Increased public readiness and appetite to reduce coal dependence*
- *Private sector financing mobilisation for the energy transition*
- *GHG emission abatement of up to 10 million tonnes CO2 equivalent*

*The Climate Investment Funds Accelerating Coal Transition Programme (CIF-ACT)*

***Text provided by the Climate Investment Funds***

## *Box 6: ADB Lessons Learned in Emerging Markets and Developing Economies*

*The Asian Development Bank's Energy Transition Mechanism (ETM) has been operational for more than three years, with the goal to accelerate the transition from coal (and other heavy fossil fuels) to clean energy, with a unique focus on early retirement of coal-fired power plants. There have been five country-level prefeasibility studies, full feasibility work in three of those countries, and three pilot transactions at various stages of development, with a fourth being evaluated. Each pilot is bespoke by necessity due to different power market dynamics, sector structures and other factors among the different countries. Each has unique challenges and each has significant learning and knowledge gain potential. We are confident that scalable models can emerge, and along with others are progressing towards demonstrating such models.*

*The first key point is the vastly different context for early coal retirement in a fast-growing developing country as compared to the developed country experience of retiring assets in a relatively flat electricity demand growth environment. In developed countries, much wealthier end users foot the bills as the ultimate payers for such transitions through their electric utility bills. In developing countries, two major concerns for sector officials and utility executives are the need for continued massive electricity infrastructure buildout just to keep up with growing demand while maintaining affordability for a significantly less affluent customer base while trying to address decarbonisation objectives. Constructive engagement on accelerated retirement cannot occur in these countries without proper understanding of, and empathy for, these vast differences.*

*The second point is the need for considerable country-level engagement across technical, social and financial aspects of the energy transition involving early CFPP retirement. Technically, CFPPs do not just provide 24/7 baseload power supply but also voltage regulation and reactive power for the grid. Early retirement of an asset cannot be considered without understanding the grid implications, which requires lengthy and meaningful engagement with the power system owner/operator for the necessary studies. Socially, CFPP retirements impact the livelihoods of the workers and businesses associated with the plant as well as those involved in the coal supply chain. In many regions, there is a broader economic impact on the community since a number of businesses and livelihoods are linked to the plant. Early retirement of coal plants also has a financial impact on public budgets at the national, subnational and local level. Therefore, operationalising a 'just transition' process in a coal retirement transaction to address the concerns of all the stakeholders first requires an enabling environment such as a national-level framework coupled with solutions at the asset level, necessitating considerable advanced engagement with the relevant authorities. Workers, businesses, communities, civil society, government and the private sector need to be involved in stakeholder consultations across national and subnational levels (provincial, municipal, etc.) all the way to the asset level. Solutions for all of these concerns do exist, but the financial implications must be understood and any negative cost impacts must have clear mitigants agreed up front.*

*The third point regards the challenges to overcome on the business side of the transaction across a broad range of interested parties. Coal plant owners with PPAs have a contractual right, backed by international court precedent, to operate their plant and generate profits until the end of the PPA period. The value proposition for them to end such contracts early requires significant effort and is more strategic, and it is easy for them to fall back to business-as-usual and not transact. Additionally, reaching consensus on a possible transaction with multiple actors (equity investors, existing lenders, offtakers, unions, local governments) can be lengthy. These actors form an ecosystem where any resistance to retire the plant can prevent the transaction from proceeding.*

*Despite financial structures that can maintain a neutral internal rate of return for the owners even with an early retirement, there can be book accounting losses which are difficult for earnings driven, publicly traded companies to agree to. There are also additional costs involved, such as addressing existing technical concerns, decommissioning costs as well as additional costs related to the just transition elements.*

*. It is also not easy to budget for such costs far in the future, which introduces risks of either underfunding or overfunding them at transaction financial close. Owner legal obligations in a particular jurisdiction may be more limited than what may be acceptable to international donors for an ETM transaction, which is another potential negotiating sticking point. The higher all these costs, the less PPA shortening can be achieved.*

*A fourth key point is that an early retirement transaction also places risks and uncertainties on the utility offtaker regarding the cost and source of replacement power and the removal of the grid stability benefits mentioned above.*

*Despite these challenges, we believe using climate finance to keep investors financially neutral is a scalable, replicable financial structure, and when combined with additional incentives via carbon markets, could create a suitable environment for achieving early coal retirement at reasonable scale.*

***Text provided by the Asian Development Bank***

### 3.2.2 Private finance

**This refers to sources of finance that come directly from the private financial sector, expecting a risk-adjusted positive return.** As noted earlier, the IEA and IFC estimate that by 2030, roughly two-thirds of the financing for energy transition in EMDEs outside of China should be sourced from the private sector.

**There is clearly potential for private finance to take a much more active role in financing emissions reductions from CFPPs.** The growth in net zero commitments made by financial institutions since COP26 has led to an increased focus on how to finance emissions reductions across the economy, and the CTC consultations through the year indicated that there is some cautious willingness to support financing of coal transition, particularly early retirement. That said, private finance is unlikely to be able to drive transactions alone, unless the economics can be made to work such that there is an expected risk-adjusted positive return. Securitisation, as used in the Pleasant Prairie transaction (see Table 2), or pure refinancing approaches, may lower overall financing costs in specific cases but may still involve cost pass-through to consumers and relies on sophisticated local structuring expertise. As such, it is unlikely to be replicable in many emerging markets. Private finance is therefore more likely to be used alongside public or other innovative financing.

**This can be achieved by blending private finance with public finance to lower the cost of capital.** The potential Cirebon transaction illustrates that concessional finance could be used catalytically to bring private capital into early retirement deals. In addition, MDB instruments (such as guarantees, FX risk management or first-loss equity tranches) that address risks that private finance finds more challenging to deal with may have significant untapped potential to mobilise private capital across energy transition investments but also for coal transition levers. That said, scaling private finance will also require that a stronger signal is sent by policy makers and regulators in advanced economies that such financing can be considered transition finance with appropriate guardrails being met, as is considered in more detail below.

[20] RMI, Private finance is coming off the sidelines on MDB reform, 2023. See also World Bank, Private sector investment lab, 2024

### 3.2.3 Innovative carbon financing mechanisms

**Given the obvious constraints on scaling public finance, an additional option for covering costs associated with reducing emissions from coal power plants, or the coal-to-clean transition, are innovative carbon financing mechanisms.** This refers broadly to instruments that monetise the value of emissions reductions associated with a coal transition transaction. One way to do this is through sustainability-linked loans or results-based financing, where reductions in the cost of capital are tied to verified emissions reductions, as in the Topocilla example detailed in Table 2.

Another is the development of approaches and methodologies to generate carbon credits associated with reducing emissions from CFFPs, generally referred to as "**coal transition credits**". These credits could be sold through project-based markets, such as through Article 6 of the Paris Agreement and through voluntary markets. Practitioner-led efforts such as Coal to Clean Credits Initiative (CCCI - see Box 7)[21], the Monetary Authority of Singapore's Transition Credits Coalition (TRACTION - see Box 8)[22], and the Energy Transition Accelerator (ETA - see Box 9)[23] are all undertaking technical work to identify potential pilots for these credits, and to ensure that these incorporate strong integrity safeguards. Methodologies for these credits are also being piloted and consulted on by standard-setters in the voluntary market, including Gold Standard and Verra[24]. **For buyers and policymakers to be satisfied that these credits are of sufficiently high integrity, methodologies will need to incorporate sufficient safeguards** to ensure the additionality and permanence of emissions reductions and that Just Transition Considerations are adequately addressed, amongst other methodological challenges.[25]

These innovative market-based carbon financing methods have not yet been widely deployed but have significant potential to source additional loss-absorbing finance, in ways that could help reduce the costs of early retirement or cover just transition programmes or the costs of renewable build out and grid upgrading.

#### *Box 7: Case Study - CCCI and SLTEC*

*In December 2023 at COP28, ACEN, the Monetary Authority of Singapore (MAS), and The Rockefeller Foundation announced a partnership to pilot the use of transition credits for the early retirement of a CFPP and replacement with renewable energy. The SLTEC CFPP is one of the first projects to test the use of transition credits and the first to consider using the methodology initially developed as part of The Rockefeller Foundation's Coal to Clean Credit Initiative (CCCI) and now under review by Verra.*[26]

[21] Rockefeller Foundation, Coal to Clean Credits (2023)
[22] MAS, TRACTION (2023)
[23] ETA, Overview (2024)
[24] Verra, Accelerated Retirement of Coal-Fired Power Plants using a Just Transition Methodology, and Combined Baseline and Additionality Assessment for the Accelerated Retirement of Coal-Fired Power Plants Module, 2024
[25] One pressing technical challenge is the need to develop emissions accounting approaches that can sufficiently accommodate both credits issued by individual projects or assets - as in CCCI and MAS's approaches - alongside jurisdictional approaches where verified emissions reductions from all or part of the energy system would be necessary to issue credits. Similar challenges have already been grappled with in the nature-based solutions space, so there are templates for policymakers from which to draw lessons. See Emergent, LEAF+ Coalition Value Proposition (2023).
[26] ACEN Renewables, ACEN, Rockefeller Foundation, and Monetary Authority of Singapore Partner to Use Transition Credits for Early Coal Retirement, 2023

*SLTEC, located on Luzon Island in the Philippines, was commissioned in 2016, with an operating capacity of 246 megawatts (MW). In 2022, ACEN successfully completed a $314 million deal to divest and to retire and transition the SLTEC plant by 2040, 15-25 years ahead of the planned use of the asset.[27] RMI developed a detailed summary of this transaction which can be found on their website here.*

*Under the transition credit pilot, ACEN is proposing to accelerate the retirement and transition of SLTEC by 10 years to 2030 and replace it with up to 1,250 MW of solar and wind projects. In April 2024, analysis by RMI showed that the proposed transition plan could reduce as much as 19 million tonnes of additional CO2 emissions.[28] In addition, ACEN is assessing options to install up to 4,800 megawatt hours (MWh) of battery energy storage systems along with the renewable energy replacement projects to support reliability and firming of the electricity system.*

*ACEN is also developing a comprehensive and tailored just transition plan for the approximately 190 workers at the SLTEC plant and broader impacts on the surrounding community. ACEN's plan includes potential redeployment to other ACEN renewable energy projects and plants, placement with other local industries, and reskilling or upskilling programmes to diversify job opportunities. Additional consultations with the broader community will continue as the project advances.*

*In August 2024, ACEN announced an agreement with investment firm GenZero and the infrastructure company Keppel Ltd. to explore the use of transition credits for the early retirement of the SLTEC project. Under the agreement, the parties will advance a development study, assess options for the origination and sale of transition credits, and explore the economic model for coal-to-clean transition projects.[29]*

*ACEN is currently advancing the project design document for SLTEC and beginning to engage buyers with the aim of reaching financial close on the first coal-to-clean transition credit project in 2025.*

*Transition credits are a novel and innovative approach to the use of carbon financing to catalyse coal-to-clean transition projects. Many questions exist and several risks have been identified. SLTEC, and other transition credit pilot projects, can help to better understand how best to design and implement transition credits, and to demonstrate the impact of credible and effective transition credits.*

***Text by Rockefeller Foundation [and Gen Zero]***

[28] ACEN Renewables, ACEN, Rockefeller Foundation Pilot Could Avoid 19 Million Tons of CO2 through Carbon Financing, 2024
[29] GenZero, ACEN, GenZero, and Keppel Join Hands to Catalyse Retirement of Coal-Fired Plants in Southeast Asia, 2024

## 3.3 How can risks associated with coal transition finance be mitigated?

**In addition to the considerations set out above, all types of finance provider worry about the non-financial risks of financing existing coal power plants to reduce their emissions.** Concerns over the environmental and social impacts of coal finance, as well as activist pressure to divest from the sector, have resulted in a high degree of caution around financing coal-to-clean solutions. One key to releasing coal transition finance is to bolster the confidence of financing partners in the credibility and effectiveness of these transactions. Four broad categories of risk that are commonly flagged against coal transition financing are:

- **Climate impacts** – i.e. that financing fails to achieve sufficiently ambitious emissions reductions. Reasons for this include carbon lock-in and emissions leakage.
- **Responsible finance** – this includes moral hazard considerations, i.e. that the expectation of coal transition finance creates perverse incentives for CFPPs.
- **Community and worker impacts** – concerns over the environmental and social impacts of coal transition financing.
- **Transparency** – concerns over whether financing is used for its intended purpose, and that it is reported and disclosed in a consistent and transparent manner.

**Voluntary or regulated guardrails can release coal transition capital by helping assure relevant stakeholders, especially financial institutions, that the above key risks are being addressed.** For example, CBI notes that since releasing their standards which support green finance more broadly, $3.26 trillion in green bonds have been issued in alignment with those standards. Importantly, while guardrails can be developed at a high level, local context must be considered in their application to ensure any guardrails are practical and avoid unnecessary slowing of progress in coal-to-clean transitions.

### Common Guardrails

*Existing initiatives and considerations*

Several initiatives and stakeholders have developed and continue to iterate on coal-to-clean financing guardrails and transparency frameworks. Examples include but are not limited to: The Managed Phaseout of High-emitting Assets (GFANZ),[31] Guidelines for Financing a Credible Coal Transition (Climate Bonds Initiative, Climate Policy Initiative, RMI),[32] Financing the Managed Phaseout of Coal-Fired Power Plants in Asia Pacific (GFANZ),[33] Criteria for Early and Managed Phase-out of the Coal-Fired Power Plants (MAS),[34] Core Framework (ETA),[35] and Managed Coal Phaseout: Metrics and Targets for Financial Institutions (RMI).[36] The Powering Past Coal Alliance have additionally published Private Finance Principles designed to guide financial institutions as they develop science-based thermal coal policies.

It is important to bear in mind, however, that if MDBs and advanced economy financial institutions are to scale the finance they provide to support transactions that reduce emissions from CFPPs, they will want to know that global standard setters and regulators in their home markets recognise the importance of such financing and have confirmed the sorts of guardrails needed to ensure integrity.

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[30] Climate Bonds Initiative, Climate Bonds, 2024
[31] GFANZ, Managed Phaseout of High Emitting Assets, 2022
[32] RMI, Guidelines for Financing Credible Coal Transition, 2023
[33] GFANZ, Financing the Managed Phaseout of Coal Power Plants, 2023
[34] MAS, Singapore-Asia Taxonomy Updated, 2023
[35] ETA, Accelerating the Energy Transition for Southeast Asia : A Roadmap, 2023
[36] RMI, Metrics and Mechanisms to Finance Managed Coal Phaseout, 2023

To date, few standard setters and advanced economy regulators have addressed this issue, albeit a number have indicated that they understand the importance of early retirement (US Treasury, MAS, EU). Additionally, the OECD – with the support of the IEA and in the context of the Coal Transition Accelerator initiative launched at COP28 – is currently undertaking an effort to establish guidance for financial institutions [across its members] by COP29.

Most of the above guidance documents focus on financing that accelerates the early retirement of CFPPs. Discussions of retrofitting, flexing or repurposing coal plants are also important but CTC consultations involving private finance have confirmed that these will likely require additional safeguards to ensure their specific risks are addressed, which are discussed below.[38]

*Key risk areas and the guardrails that can help*

| Risk Area: Climate impacts | | |
|---|---|---|
| **Supported Guardrails** | **Remaining Questions** | **Taxonomy and Framework Examples** |
| **Sufficient Emissions Reductions** | | |
| 1. **Emissions savings** compared with a case without the use of the transition finance | • How should emissions savings calculations be verified? | Criteria for Early and Managed Phase-out of the Coal-Fired Power Plants (MAS):<br>"The early coal phase-out results in positive absolute emissions savings over the expected total lifetime of the coal plant compared with a case without it. The emissions savings need to be independently verified or acknowledged by internationally recognised bodies or programmes." |
| 2. **Alignment with science-based pathways**, potentially including a backstopping commitment to phase out unabated coal combustion at the coal plant by country-specific, 1.5°C-aligned coal phaseout deadlines. | • There remains a dearth of regional-specific energy pathways, particularly in EMDEs, let alone asset-level pathways. How can financial institutions assess and demonstrate alignment with net-zero goals?<br>• Is it realistic to expect a transition roadmap from the system operator showing asset level transition pathways?<br>• Which independently developed country pathways should be used? | Criteria for Early and Managed Phase-out of the Coal-Fired Power Plants (MAS):<br>"The phase-out of unabated coal combustion at the coal plant is aligned with, or happens earlier than 1.5°C-aligned coal phase-out deadlines. In advanced economies, this means the coal plant retires at the latest by 2030, and in other countries by 2040, in line with the International Energy Agency's Net Zero pathway. Should a country have a national coal phase-out target that is earlier, national targets should be adhered to instead." |
| 2. **"No new coal" commitments** at the entity or jurisdictional level, or no plans for continued unabated coal capacity buildout. This guardrail also has the potential to address some leakage risks. | • How should financial institutions assess the nature, strength and stability of such commitment?<br>• How should new gas generation be viewed and assessed?<br>• How should increased use of existing other coal plants be viewed and assessed? | Criteria for Early and Managed Phase-out of the Coal-Fired Power Plants (MAS):<br>"The coal plant owner has an entity-level commitment to no new abated and unabated coal power plant development or procurement globally, beyond their plants that have reached financial close or final investment decision by December 2021" |

[37] E.g. US Treasury, Principles for Net-Zero Financing & Investment
[38] https://rmi.org/finding-repurpose-demystifying-coal-repurposing-in-the-global-energy-transition/

| | | |
|---|---|---|
| **Leakage** | | |
| 4. Entity or jurisdictional-level **transition plans.** Entity-level transition plans can also ensure finance supports the long-term transition of utilities and power producers. When host countries have set national transition plans, with energy-sector specific modelling, coal transition finance can align with and support such plans. | • Should lenience on transition plans be permissible in the short-term in undersupplied jurisdictions (e.g., South Africa), particularly given the political salience of energy security?<br>• How should transition plan credibility be assessed? Is independent verification or recognition by international bodies or programmes required? | Criteria for Early and Managed Phase-out of the Coal-Fired Power Plants (MAS):<br>"The entity has a Paris Agreement (PA)-aligned transition plan that follow the principles of transition finance outlined by International Platform on Sustainable Finance. The transition plan needs to be independently verified or acknowledged by internationally recognised bodies or programmes. Acknowledging that this may pose to be a challenge for many of the entities that are in the transition process, it is not expected for the entities to be PA aligned today, but to develop a plan on how to be aligned with that target. The alignment needs to happen by 2030 at the latest" |
| 5. Accompanying coal retirement or decreased utilization with **clean energy deployment** can assure lost generation is replaced cleanly | • Pairing reduced coal generation, through retirement or decreased use, with clean energy deployment has proven difficult legally and financially in past MPO transactions. How strictly should this criterion be applied, and to what extent should future commitments to build renewables – even if financed separately – be considered a sufficient guardrail against leakage?<br>• How should financial institutions assess how coal phase-out will be delivered alongside necessary investment in grid infrastructure and renewables? | Core Framework (ETA):<br>"The energy transition plan ensures that neither national energy security nor energy access are compromised. If this is unavoidable, then measures will be implemented to mitigate and address any potential adverse impacts on energy security and/or access." |
| **Carbon Lock-In** | | |
| 6. **The expected lifetime is not extended** for coal combustion. | • Should this criterion be limited to unabated coal combustion or also abated? | Criteria for Early and Managed Phase-out of the Coal-Fired Power Plants (MAS):<br>"Investments made as part of the early coal phase-out process do not extend the expected lifetime for coal combustion. Early coal phase-out has to lead to cessation of fossil fuel-based activities of a plant in line with the timeline specified" |
| **Risk Area: Responsible Finance** | | |
| **Supported Guardrails** | **Remaining Questions** | **Taxonomy and Framework Examples** |
| **Moral Hazard** | | |
| 7. Eligibility based on a **threshold or "cut-off" date** with regard to financial close or final investment decision of the coal plant. This can be understood as the point in time at which all the financing agreements have been signed. | • Should this be set as prior to December 2021, following agreement on the Glasgow Climate Pact? What threshold or "cut-off" date should apply to coal plant eligibility for which jurisdictions?<br>• How should financial institutions assess conditions and commitments made in relation to such a threshold? | Guidelines for Financing a Credible Coal Transition (Climate Bonds Initiative, Climate Policy Initiative, RMI):<br>"The financial close or final investment decision of the coal plant is prior to December 2021, following agreement on the Glasgow Climate Pact." |

| Risk Area: Climate impacts | | |
|---|---|---|
| **Supported Guardrails** | **Remaining Questions** | **Taxonomy and Framework Examples** |
| **Additionality** | | |
| 8. The coal plant's **fair value is positive** at the time of the proposed coal transition. | • The economics of plant operation should be assessed against a forward-looking policy forecast. Does the fair value need to be independently verified or acknowledged by internationally recognized bodies or programs?<br>• Does any further prioritization make sense currently (provided fair value is positive), particularly given difficulty in identifying viable coal transition investment opportunities? | Financing the Managed Phaseout of Coal-Fired Power Plants in Asia Pacific (GFANZ):<br>"Financial institutions should assess whether the need for financing is genuine to accelerate early CFPP closure (e.g., if a CFPP has positive fair value)." |
| 9. Potential assessment of relative emissions and plant age. | • Does prioritizing the worst emitters create perverse incentives?<br>• Should there be a cut-off requiring a coal plant be retired a certain number of years early or achieves a threshold of emissions savings? | Criteria for Early and Managed Phase-out of the Coal-Fired Power Plants (MAS):<br>"Coal plant has to be retired at or before 25 years of operations at the latest" |
| **Risk Area: Community and worker impacts** | | |
| **Supported Guardrails** | **Remaining Questions** | **Taxonomy and Framework Examples** |
| 10. The coal phaseout transition should include a **just transition plan** to mitigate impacts on workers, electricity customers, the local community, and other impacted stakeholders. | • What coal phaseout specific elements should be highlighted in a just transition plan?<br>• How should financial institutions assess what measures are in place to mitigate adverse community impacts? | The Managed Phaseout of High-emitting Assets (GFANZ):<br><br>"For example, in the context of the energy transition, the Council for Inclusive Capitalism has developed a framework with four core pillars: (1) supporting universal access to energy and a net-zero GHG emissions world; (2) evolving the energy workforce to support a low- and zero-carbon energy future; (3) building community resilience; and (4) fostering collaboration and transparency throughout the process." |
| **Risk Area: Transparency** | | |
| **Supported Guardrails** | **Remaining Questions** | **Taxonomy and Framework Examples** |
| 11. **Forward-looking metrics and targets tailored to managed phaseout** are needed. | • Which metrics are fit for purpose?<br>• Should a governmental body or other entity be created for measurement, reporting, and verification? | Managed Coal Phaseout: Metrics and Targets for Financial Institutions (RMI):<br>"FIs can consider enhancing their metrics and targets to embed managed phaseout-specific considerations as a means to better facilitate and demonstrate FIs' contribution to real-economy decarbonization."<br>Proposed metrics "are not mutually exclusive and could work in tandem with existing metrics and target-setting methodologies":<br><br>• Phaseout Plan Coverage<br>• Financed Emissions for Phaseout<br>• Phaseout Alignment Mapping<br>• Phaseout Impact Assessment |

***Integrating Guardrails into Financial Decision-making***

Embedding guardrails within strategic outlets, such as those below, can spur relevant regulation and achieve sustainable finance, while allowing for adaptation to regional and local contexts (e.g. through national financial regulation). By mitigating risks faced by financial institutions, they can scale coal-to-clean finance with confidence. Policy makers can consider the following types of outlets:

- Frameworks and standards that support recognition of coal transition finance as "sustainable finance," such as national or regional sustainable finance taxonomies, labelled finance products, or labelled instrument standards for use-of-proceed and sustainability-linked instruments.
- National financial regulation, particularly where existing financial regulation on coal exclusion has created risks to financial institutions investing in the coal transition, whether through exclusions or through other regulations such as capital requirements.
- Climate-related financial disclosure standards, such as the IFRS Sustainability Disclosure Standards, which can support both transparency for financial institutions providing coal transition finance and enable higher quality data disclosure from their clients.

Finally, while some of the above guidance may apply to coal repurposing, additional guardrails may be needed in contexts where repurposing, rather than retirement, is being considered[39], for instance:

- Grid reliability needs, such as resource adequacy, frequency and voltage control, and the costs of repurposing options compared to cleaner options to meet those grid needs
- Carbon lock-in and backsliding risks associated with repurposing decisions and any safeguards against lock-in or backsliding
- Ensuring existing plans and regulatory/procurement frameworks demonstrate continued and increased deployment of clean generation and flexibility resources, that is enabled by repurposing
- Expected costs and benefits from repurposing, including costs and risks to ratepayers (cost savings due to reusing of certain equipment, risks of using unproven or potentially costlier technologies such as CCUS, opportunity costs of using existing transmission and interconnection infrastructure for coal repurposing rather than clean resource deployment) and the economic impacts (e.g. due to onsite job retention).

**Conclusions and recommendations to support the mobilization of coal transition finance**

**Multilateral development banks and other public finance providers, should continue to scale up support and finance for accelerated coal-to-clean transitions, including by using their technical assistance, project preparation and catalytic capital to support country ambition and to crowd in private and innovative carbon finance.** Public finance providers could, for example, consider supporting project development alongside setting targets for desired public to private finance ratios and devote resources to developing innovative new technical and financing approaches designed to attract greater private finance interest.

[39] RMI, Finding Repurpose: The Power of a Pre-Feasibility Analysis in Coal Repurposing, 2024

**Consistent with mandates in their jurisdictions, governments and regulators could consider clarifying that finance provided to support accelerated coal-to-clean transitions that meets necessary guardrails is considered transition finance.** This recognition of coal transition finance could be reflected in sustainable/transition finance taxonomies and other financial regulation and guidance. It is important to address the regulatory and institutional barriers to coal transition investments, to allow the financial sector to play a problem-solving role, rather than simply divesting which does not always support – and can hinder – transition. Additionally, recognising that these types of transitions will benefit from consistent levels of transparency and scrutiny across jurisdictions, international financial reporting standards bodies, such as the International Sustainability Standards Board, could set out guidance on disclosures to enable stronger and more consistent reporting on coal transition finance, including to deliver rigorous and prudent assessments of emissions reductions achieved relative to robust baselines.

**Recognising the importance of mobilising private finance to support coal-to-clean transactions alongside use of public and other loss-absorbing finance, net zero committed private financial institutions are encouraged to support the development and financing of innovative transactions and programmes.** This would require financial institutions to understand the technical nature and emissions reductions potential of these transactions, to update any voluntary coal policies and risk appetites to accommodate such transactions, to understand the guardrails and form a view that they have been met, and to disclose sufficient information on any transactions supported.

**Recognising that even if public and philanthropic catalytic capital is significantly scaled, the costs associated with coal-to-clean transitions will necessitate additional finance, governments and technical bodies should explore further innovative solutions, including high integrity coal-to-clean carbon credits.** Governments and regulators should engage with the range of initiatives that are exploring jurisdictional and asset-level solutions - including coal-to-clean credits sold through Article 6 or the voluntary market - to understand their potential benefits and risks and guardrails being developed to manage these risks and ensure these instruments meet high supply and demand-side integrity standards.

# 04
# Scaling successful projects

As Chapters 2 and 3 highlight, policy and finance must work in tandem to scale coal-to-clean transitions. A range of initiatives have emerged working across policy and finance to turn coal-to-clean transition ambition into on-the-ground projects. This chapter reviews some of these initiatives, taking stock of emerging solutions, pilot projects and initiatives, and considers how solutions could be replicated and scaled in different market contexts.

## 4.1 A growing ecosystem of initiatives

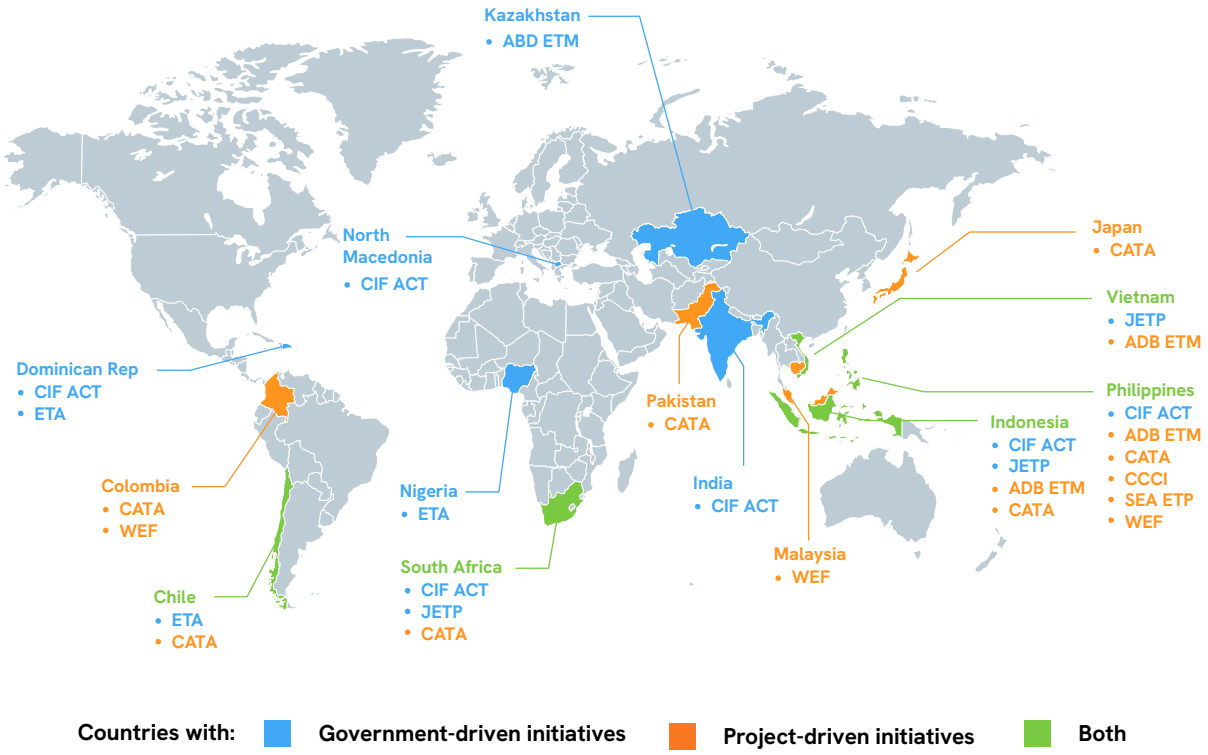
**Since the first Just Energy Transition Partnership (JETP) was launched in South Africa in 2021,[40] a diverse ecosystem of initiatives has grown to support countries' coal-to-clean transition efforts.** Support from these initiatives spans creating enabling environments for coal-to-clean transitions in different countries, advancing specific financing mechanisms, and targeted technical assistance for demonstration of coal retirement projects.

**While many initiatives include both policy and finance components, in general, some initiatives have approached activities from a more government-driven top-down lens.** These initiatives have focused on supporting country commitments and sharing of lessons learnt and best practice – for example through the Powering Past Coal Alliance (PPCA) – the development of policy roadmaps, power sector and just transition plans, and putting in place the market structures and incentives to enable clean resource deployment alongside emissions reductions from existing coal plants. The country platforms established under the JETPs[41] and financial and technical assistance provided through the CIF ACT and the Energy Transition Council's Rapid Response Facility are strong examples of this government-led, holistic approach to coal transition.[42] Since then, country-level financing approaches such as the jurisdictional crediting approach proposed by the Energy Transition Accelerator (ETA) have also been launched to mobilise capital for governments' energy transition strategies.[43]

Support for holistic power sector planning and policy is critical to create the long-term structures that will enable a coal-to-clean transition. In particular, ensuring sufficient support and incentives to enable renewable energy and grid investments will be a critical enabler and component of coal-to-clean transitions, which is also a focus of the Coal Transition Accelerator within its pillar to decrease the cost of capital for renewable energy. In addition, effective power sector plans can provide confidence that electricity will remain reliable and affordable as coal is phased out, and can be important to underpin the credibility of country-level coal commitments and financing (as highlighted in guardrails in Chapter 3). Such plans can also serve to identify priority plants to transition, helping to streamline approval processes by system operators and build the pipeline of coal-to-clean transition projects – a key building block for turning plans and commitments into action.

40 South African Presidential Climate Commission Just Energy Transition Investment Plan (JETP), 2022
41 RMI, JETPs 101, 2023
42 Climate Investment Funds Accelerating Coal Transition, Accelerating Coal Transition, August 2024; Energy Transition Council, ETC Annual Report 2023, 2024
43 Energy Transition Accelerator, Core Framework, 2023

**Alongside these comprehensive country-driven approaches, several initiatives aim to accelerate bottom-up, project-level solutions.** This includes asset-level technical assistance for coal retirement projects – such as through the Coal Asset Transition Accelerator (CATA) or Southeast Asia Energy Transition Partnership (SEA ETP) – which have worked with plant owners to advance coal retirement pilots.[44] Other initiatives have also looked to pilot coal retirement deals to demonstrate specific financing approaches, such as the Coal-to-Clean Credit Initiative (CCCI) and TRACTION Coalition – focused on transition credits – the ADB's Energy Transition Mechanism (ETM), or the World Economic Forum's (WEF's) initiative on bundled financing vehicles.[45] Figure 5 below showcases the current landscape of coal-to-clean transition initiatives, highlighting countries where there is a focus on either government-driven or project-driven approaches.




Includes announced, in-progress, and completed coal-to-clean projects

Figure 5: Current landscape of coal-to-clean transition initiatives

[44] Carbon Trust, CATA's coal transition journey, 2022; Southeast Asia Energy Transition Partnership, Energy Transition Partnership, 2024
[45] Monetary Authority of Singapore, Transition Credits, 2024; Asian Development Bank: Energy Transition Mechanism, 2024

## *Box 8: Transition Credits Coalition (TRACTION)*

*The Monetary Authority of Singapore (MAS) launched the Transition Credits Coalition (TRACTION) at the UNFCCC COP28 in Dubai with industry members and partners, following the publication of a joint working paper by MAS and McKinsey & Company that explored how transition credits could accelerate the managed phase-out of coal plants and their replacement with cleaner energy sources.*

*TRACTION comprises more than 30 members and knowledge partners across key stakeholder groups from carbon credit services, energy financing, project development, risk management and non-governmental organisations. It is focused on identifying system-wide barriers and solutions that can enable transition credits to be used as a credible financing instrument. There are three areas of work:*

- *Support high-integrity transition credits generation. Transition credit methodologies are currently under development, with a number of different approaches emerging. To support the development of high integrity transition credits, TRACTION is working with industry members (including standard setters and methodology developers) to bring greater clarity on the key attributes of transition credits.*
- *Enable transition credits transaction scalability. While such transactions can be highly complex and challenging to scale, there is potential value in drawing out common considerations by market participants, solutions and structuring approaches. TRACTION is thus looking to develop a playbook that can help coal plant owners, project developers and financiers to structure and implement transition credits transactions.*
- *Bolster buyers' confidence and trust in transition credits. For transition credits to be a viable financing instrument, there needs to be a robust pipeline of demand for such credits. TRACTION is engaging investors and offtakers in the voluntary and compliance markets to explore how transition credits can meet their expectations, and to identify tools that can scale demand for such credits.*

*The workstreams are co-led by TRACTION industry members and supported by the Rocky Mountain Institute as the TRACTION secretariat. In parallel, some of the solutions identified by TRACTION are being tested in two pilot projects in the Philippines (one of which is by ACEN, see relevant box in Chapter 3). TRACTION will be publishing its work at UNFCCC COP29 and COP30.*

*Please access this link for more information and the latest updates on TRACTION and MAS' initiatives in transition credits.*

***Text provided by TRACTION (Monetary Authority of Singapore)***

Advancing bottom-up projects can provide valuable proof points and lessons learned to complement more top-down country strategies. Successful projects can showcase the feasibility of the transition – thereby de-risking specific solutions – while providing learnings for future transactions and informing decision-making processes in larger country programmes. If done well, initial demonstration projects can build momentum to support policy and can be built to dock into future policy mechanisms to enable their scaling. The Tocopilla project in Chapter 3, for example, envisions potential replication through carbon market mechanisms in Chile.[46]

## 4.2 Learning from projects to enable replication and scaling

While there are a growing number of projects and initiatives, the coal-to-clean transition is still nascent in many markets worldwide. Continuing to test and demonstrate solutions will help grow the market, but it will be critical to do so in a way that enables eventual replication and scaling of solutions. This could require:

- Strong coordination across initiatives to ensure that lessons learned are shared and inform scaling approaches. Existing initiatives and projects have offered early lessons and promising solutions for reducing emissions from the existing coal fleet. The next stage should not only further test ideas, but ensure coordination to facilitate collective learning-by-doing across initiatives and markets.
- Implementation of a broad range of pilots across different market structures. While there is strong interest to deploy coal transition finance and technical assistance today, available support may currently be outpacing demand. Finding and originating projects that aim to reduce emissions from existing coal plants has been especially difficult, leading to very few demonstration projects in EMDEs to date, and few additional opportunities in the pipeline. To date, public finance platforms and philanthropy have played an important role in supporting early stage or risky projects, and can continue to derisk and demonstrate unproven but potentially catalytic solutions. However, eventually, there is a need for solutions to ensure project origination can scale without relying directly on public and grant capital.
- Identification of structures to move beyond bespoke project-by-project approaches. Given the diversity of markets, there will be no one-size-fits-all approach to scaling. The section below, however, proposes considerations and potential models to support scaling in different contexts.

[46] RMI, Transition Finance Case Studies, 2024

## 4.3 From demonstration projects to scaled action

| Scaling Mechanism | Relevant Financing Mechanisms | Examples | Potential Unlocks to Origination & Scaling |
|---|---|---|---|
| **Project-Based Scaling**<br><br>Allowing more private-sector-led project opportunities | Debt instruments, such as:<br>• Non-recourse lending tied to renegotiated clean contracts<br>• Use-of proceed or sustainability-linked lending<br><br>Equity mechanisms, where upside can be realized through acquiring and transitioning coal to other uses | Green and sustainability-linked loan for Engie Chile supported and derisked by IFC, tied to Engie's decommissioning or reconversion of remaining coal assets[47]<br><br>Starwood Energy refinancing of project debt for its Logan & Chambers coal plant, terminating PPA early, and building storage on site instead[48] | • Enabling conditions create potential upside for transitioning from coal to clean generation<br>• Strong awareness of opportunities by project owners and developers<br>• Initial demonstration projects could be supported through dedicated origination teams in countries where enabling conditions are strong<br>• Standardization of approaches could support bundling and replication over time |
| **Public-Private Scaling**<br><br>Centralized programs that allow different projects to access finance or other solutions | Blended debt to refinance plant balance<br><br>• Non-recourse debt tied to coal-to-clean contract renegotiation<br>• Equity instruments, where IPP plants are acquired and transitioned<br>• Transition credits to cover vialibity gap for coal-to-clean | Cirebon deal, which used concessional finance to support refinancing of plant balance[49] | • Centralized procurement, for example, through competitive procurement of coal-to-clean PPA renegotiations or auctions for transition credits, can support project developer interest<br>• Initial demonstration projects could be supported through dedicated origination teams, especially in markets with just a few coal plants |
| **Utility Scaling**<br><br>Focused on programs to support utility financial health and transition strategies | Legislation that enables utility access to low-cost financing, such as ratepayer-backed bond securitization<br><br>• Jurisdictional crediting approaches | Ratepayer-backed bond securitization legislation, which has been enacted in several US states[50] | • Technical support for strong utility- and power-sector transition planning<br>• Utility or sector-level financing solutions that can be used flexibly to support projects or other enabling investments (e.g., in grid infrastructure) |

[47] International Finance Corporation, Engie SSL Project Detail, 2024
[48] RMI, Transition Finance Case Studies, 2024
[49] Asian Development Bank, ADB agreement with Indonesia to retire 660 mw of coal plant almost 7 years early , 2023
[50] RMI, Securitization in Action, 2022

### Project Base Scaling

Several coal retirement projects have already been pursued by private sector developers and financiers - for example, the SLTEC project in the Philippines or the private-equity-led Starwood Energy project in the US. Often, these projects occur in markets where:

- Clean energy is cost-competitive with existing coal, where the coal-to-clean transition offers upside for both plant owners and their offtakers. Offtakers tend to benefit from a transition by no longer being locked into costlier coal while plant owners can often use existing interconnection points to make clean resource investments that may offer additional upside. This upside benefit may be especially true if coal contracts can be renegotiated to longer-lived clean energy and/or capacity contracts. The low-risk long-term cash flows in such contracts can help plant owners raise cheap, non-recourse financing, which can both refinance any remaining obligations on coal assets and finance clean buildout.
- Both power producers and their offtakers tend to be private entities, as can be the case in deregulated markets with large commercial or industrial offtakers or private distribution companies. While approval by a regulator is likely still required, aligned incentives across private sector entities can help reduce the complexity that can come with engaging a vertically integrated system operator.

#### Key unlocks

To further support and scale this bottom-up approach, project action could be facilitated by:

- Continued upstream support for market design and incentives to ensure that clean resources, including clean flexibility and other grid resources, can compete fairly with fossil resources and be effectively integrated into the grid.
- Stronger awareness from plant owners, developers and financial institutions about the opportunity and upside for such projects.
- Continued development of innovative financing solutions that help improve the financial attractiveness and scalability of projects. These could include blended finance solutions to improve project bankability and private capital mobilisation; or private finance solutions, such as approaches that enable eventual standardisation and bundling of multiple projects (e.g. to further reduce costs of capital, increase ticket sizes to appeal to a broader set of investors) or labelled debt products that could make transactions more appealing to entities with sustainability targets.

### 4.3.1 Public/Private Scaling Platforms

In many markets system operators have tremendous leverage when it comes to decision-making processes for the wider grid. In single-buyer markets especially – particularly those with state-owned utilities – established solutions are unlikely to scale in the near term without public-private partnerships that combine public sector support and investment mechanisms with private sector business model innovation and resource mobilisation.

#### Key unlocks

In markets with multiple IPPs, it may be more effective to scale coal-to-clean transition projects through centralised processes rather than asset-by-asset. In these markets, procurement approaches by system operators have been highly effective at mobilising private investments in clean energy. Similar approaches could be used to scale coal-to-clean transition investments while ensuring system operators can procure resources needed to support reliability. While asset-level action in the near term could still be important to support proof of concept and demonstration, eventual scaling could take the form of:

- Procurement by a public investment entity, such as a sovereign wealth fund or other public investment body with lower return requirements, to buy existing coal plants and their PPAs with the aim to transition them early.
- Procurement by system operators for coal-to-clean contracts, soliciting bids from plant owners with existing PPAs to transition those to clean.
- Where necessary, auctions for transition credits can also help ensure price transparency of credit prices while creating a strong oversight body to help ensure credit integrity.

### 4.3.2 Utility or Government Programmes

In markets where vertically integrated utilities hold complete or near monopolies on the power-system value chain and own the majority of coal plants, it may be more effective to target solutions and financing at a utility level. Broadening away from a project-based lens could also enable finance to flow to other critical enablers of the coal transition, such as financing upgrades to transmission and distribution systems.

#### Key unlocks

Convening utilities with financial and policy stakeholders can help develop and scale innovative solutions more programmatically. This could take the form of:

- Regulatory efforts that enable utilities to use financing mechanisms for the coal-to-clean transition. A parallel for such approaches is ratepayer-backed bond securitisation which has allowed utilities to refinance remaining plant balances through low-cost debt while investing in new clean generation.
- Utility-level financing strategies that can address challenges such as existing debt or weak balance sheets, whether through structured packages or other innovative mechanisms.
- Jurisdictional financing initiatives like the ETA could also theoretically be used to mobilise financing for utility-driven transition strategies.

### *Box 9: ETA: Perspectives from the US*

*The US believes that high integrity carbon markets are critically important to meeting the world's climate goals. Several US government agencies came together to issue a Voluntary Carbon Markets Joint Policy Statement and Principles in May 2024, which highlight the need for supply integrity, demand integrity and market integrity – and note the benefits of jurisdictional or sector-scale crediting:*

*"Some criteria, such as those for avoiding emissions leakage or for ensuring additionality of more capital-intensive infrastructure and policy alignment, can be more readily achieved through sector-wide or jurisdictional-scale approaches to crediting and nesting of project-level activities into jurisdictional-scale programs and accounting."*

*The Energy Transition Accelerator is one example of this approach in action.*

***About the Energy Transition Accelerator***

*The US Department of State, The Rockefeller Foundation and the Bezos Earth Fund have worked in partnership to design the Energy Transition Accelerator (ETA) with the aim of catalysing finance to speed the just energy transition in emerging and developing countries.*

*Under the ETA's proposed design, participating private sector and sovereign government buyers would offer advance purchase commitments for credits to be generated by participating host countries through the implementation of ambitious energy transition strategies. Credits will be issued when emissions reductions are achieved and verified and, when delivered to buyers, may be used for voluntary or compliance purposes. A portion of the finance generated will be dedicated to addressing adaptation and resilience in vulnerable countries.*

*Participating host countries will generate high-quality carbon credits for verified reductions in emissions from electricity generation. The revenue generated can be channelled by host countries to those activities most effectively contributing to the sector's decarbonisation. These activities could include accelerated renewables deployment, grid and storage improvements, the advancement of enabling policies, and early coal retirement.*

*An innovative feature of the ETA is the introduction of a sector-scale crediting approach for the electricity sector, intended to ensure environmental integrity and to incentivise broad sectoral transformation.*

*Credits transacted by the ETA Coalition will be certified to standards and use methodologies that meet minimum quality criteria, including that they...*

- *apply appropriate tools to avoid emissions leakage;*
- *meet high performance standards for demonstrating additionality;*
- *represent actual impacts on emissions levels evidenced by scientific, up-to-date, conservative and reliable data;*
- *enable ambitious host country just transition policies and targets;*
- *require baselines to be set below business-as-usual and adjusted downward as necessary to support their compatibility with host country NDCs, Long Term-Low Emission Development Strategies, and avoid crediting for or locking in levels of emissions that are incompatible with the long-term temperature goal of the Paris Agreement; and*
- *are consistent with Article 6 of the Paris Agreement, the Emission Unit Eligibility Criteria of CORSIA, and the Core Carbon Principles of the Integrity Council for the Voluntary Carbon Market (ICVCM).*

*The ETA partners are supporting the development by Environmental Resources Trust (ERT), a wholly owned nonprofit subsidiary of Winrock International, of a sector-scale crediting standard that rewards host jurisdictions for verified emission reductions achieved on an aggregate basis across the entire electricity sector (i.e. a sector no-lose crediting standard).*

*The key elements of the sectoral crediting standard being developed by ERT/Winrock were released along with the Core ETA Framework in 2023 (available at etaccelerator.org). ERT/Winrock plans to continue to consult with pilot countries, experts and other key stakeholders, and to release a proposed crediting standard for formal public consultation in 2025.*

*The aim is for this sectoral approach to facilitate systemic changes to decarbonise electricity through a broad range of activities contributing to emissions reductions, such as early coal plant retirement, accelerated renewables deployment, and grid and storage improvements.*

*Importantly, unlike targeted project-based crediting approaches, a sector-level approach can support and credit countries for the impact of infrastructure investments, as well as legal, policy and regulatory measures, such as changes in dispatch order, that can accelerate decarbonisation. The approach can also mobilise resources that host governments can use to address the needs of communities and workers affected by the energy transition. By accounting for emissions performance across the sector, the approach can also address issues of uncertainties related to additionality and the risk of emissions leakage.*

***Text provided by the US Department of State***

# Conclusion and Next Steps

The coal-to-clean transition is already under way in many countries around the world. Nearly all of the global coal fleet lies in countries with coal phase-out or net zero commitments and there is a growing number of initiatives aimed at developing solutions to help countries implement these commitments.[51] Meanwhile, across a diverse range of markets and countries coal is being phased out and replaced by renewables faster than had been thought possible, contributing to the body of evidence to show that coal-to-clean transitions are not only feasible, but beneficial. The UK reduced the proportion of coal in its energy mix from almost 40% in 2012 to 0% this year largely as a result of the growth in renewables. Chile, despite having relatively young coal power plants and a fast growing demand for electricity, has reduced the percentage of coal in its energy mix from 41% in 2014 to 17.3% in 2023,[52] also largely as a result of increases in wind and solar.

However, implementing and scaling the coal-to-clean transition comes with a range of challenges – from managing the risks countries and communities face as power systems and economies transition, to funding the build out of renewables and associated grid enhancements and addressing the potential costs associated with the early retirement and repurposing of coal. This report has mapped out the emissions reductions that need to be made to get on track with a 1.5°C pathway and the role that can be played by two key levers in particular - early retirement and repurposing for flexibility - to achieve these reductions. It has identified three key steps that must be taken to deliver retirement and repurposing at the speed that is necessary to get on track for 1.5°C:

- Governments should be supported to create an enabling policy environment that sets a clear direction, facilitates consultation around how to achieve a just transition that secures reliable access to energy for all, and creates a level playing field for renewables and other zero emissions resources to compete.
- Finance for coal-to-clean transitions should be scaled, and effective financing instruments need to be developed to support the aspects of the coal-to-clean transition where finance is less willing to invest and returns may be low or negligible, including costs of retirement of coal power plants, costs of repurposing and support for affected workers and communities.
- A pipeline of priority projects for accelerating the coal-to-clean transition should be developed to accelerate implementation.

While countries will have different starting points and will require their own tailored approach to the coal transition, there is strong value in ensuring global dialogue, sharing of lessons learned and taking stock of solutions. Collective learning, collaboration and experimentation in this nascent and challenging space will help achieve the speed and scale of coal transitions needed to meet the aims of the Paris Agreement.

[51] Global Energy Monitor, Global Coal Plant Data, October 2024
[52] World Resources Institute, Countries Phasing Out Coal The Fastest, 2023

As an initiative that brings together public and private stakeholders, including governments, international organisations, and public and private financial institutions, Commission participants might consider further work through the CTC to monitor progress on the recommendations in this report, and to scope and develop nascent and new technical and financing approaches, ensure that lessons learnt across different geographies and pilot projects are available to all, and to support the development of new projects.

Specific activities the CTC could consider over the next two years might include:

- Scoping new technical and financing approaches: Developing definition, use case, routes to finance and guardrails for repurposing as a lever. Scoping the challenges and opportunities of retiring older coal plants. Developing and supporting implementation of guidance around reflecting finance for early retirement and repurposing in transition finance taxonomies.
- Sharing lessons learnt across geographies: Consolidating lessons learnt and best practice, especially around implementing and financing a just transition, and delivering coal retirement transactions.
- Supporting the development of new projects: Developing a structured approach to the provision of capacity building to countries looking to accelerate progress, including by working with governments, utilities, financial institutions and civil society to establish a pipeline of plants suitable for retirement/repurposing.