

# Financing the Managed Phaseout of Coal-Fired Power Plants in Asia Pacific

FINAL REPORT

Guide to support the financing of the early retirement of coal-fired power plants as part of a just net-zero transition

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Asia-Pacific Network of the Glasgow  
Financial Alliance for Net Zero

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<sup>1</sup> Composition available on [GFANZ Asia-Pacific Network Webpage](#).

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# Foreword



**Ravi Menon**

Chairman, GFANZ APAC Network Advisory Board  
and Managing Director, Monetary Authority of Singapore

A handwritten signature in blue ink that reads "Ravi".

Coal power generation is the largest source of carbon dioxide emissions globally. Every credible pathway to avoid the most severe impacts of climate change requires accelerating the phaseout of unabated coal power.

Coal phaseout is especially critical in the APAC region. If we continue to operate the region's existing coal power assets as planned, this would exhaust about two-thirds of the remaining 'carbon budget' to limit average global temperature warming to below 1.5 degrees C.

Coal accounts for nearly 60% of power generation in the region, where energy demand is expected to grow rapidly. The Coal economy is also a key source of employment, with the IEA estimating that more than 6.7 million people in Asia are employed across the coal

value chain. The economics of phasing out coal is also more challenging as coal plants in APAC are younger, and new plants continue to be built.

The transition away from coal is a complex challenge, which requires us to take a systems approach to address climate, energy security, and socio-economic concerns. We need to start now, as it will take time to achieve the scale needed to phase out the ~5,000 coal-fired power plant units in the region. Done right, the early retirement of coal will reduce billions of tons of emissions, boost public health, and improve access to affordable, sustainable, and reliable energy.

Unlocking investment to both enable the roll-out of renewables, and accelerate the transition away from coal, is thus imperative to meet our global climate goals.

This report incorporates findings from the GFANZ APAC Network's extensive engagements with financial institutions and policymakers across the region. It provides guidance and practical steps for financial institutions committed to net zero can independently take to credibly support the financing of coal phaseout transactions in APAC. Such financing can also be part of financial institutions' transition plans.

The report adopts a principles-based approach in assessing coal phaseout plans, and should be read alongside global and regional taxonomies and standards by regulators and international standard setters. It should also be read alongside ongoing efforts to enhance the economic viability of managed coal phaseout through blended finance approaches and the use of high-integrity carbon credits.

We would like to acknowledge and express our gratitude to the numerous organizations which produced the resources highlighted throughout this report, and especially thank the core financial institution working group, consultative panel, and knowledge partners who have volunteered their time in developing this guidance. In particular, we are grateful to DBS Bank and HSBC, which co-led the workstream that developed this report, along with our key partners the Asian Development Bank and the Monetary Authority of Singapore.

# Introduction

The early retirement of high-emitting assets will be a key element of decarbonization on the road to net zero. Managed phaseout (MPO) refers to credible, financeable strategies for such early retirement. Financing based on a forward-looking coal phaseout strategy provides an alternative to simply withdrawing or withholding finance from CFPPs and their owners. MPO can allow financial institutions to promote an orderly<sup>2</sup> transition, mitigate financial marginalization for companies with high-emitting assets but credible transition plans, and draw in broader stakeholders in support of a just transition<sup>3</sup> and continuity of critical services.<sup>4</sup>

This report aims to bring together and build on emerging frameworks for, and recent experience of, the MPO of CFPPs, to provide practical, voluntary guidance for net zero-committed financial institutions considering how and whether to finance the owners of CFPPs or those assets directly in a manner consistent with their independent net zero objectives. Other strategic options for transitioning CFPPs, as part of one of the other three financing strategies introduced in the [GFANZ Net-Zero Transition Plan \(NZTP\)](#) voluntary framework, such as investment in retrofitting and repurposing, may also play a role, but are not the focus of this report.

**Audience:** The report is intended to empower **net-zero-committed private financial institutions** who may choose to provide financing in support of plans for accelerated phaseout, by setting clear expectations for relevant stakeholders, including the owners and operators of CFPPs. This will better enable financial institutions to work alongside governments, multilateral development banks (MDBs) and other public and private sector parties in supporting **coal phaseout plans that are credible, financially viable, and inclusive.**

This guidance is therefore also highly relevant to companies that own and operate CFPPs, as well as organizations that oversee power systems such as state-owned energy companies, regulators and governments, all of which will need to understand the expectations of net-zero financial institutions. It should be of interest also to public policymakers and global public and private sector entities seeking to hasten coal phaseout.

Private financial institutions are increasingly setting out transition plans, drawing on the [GFANZ Net-Zero Transition Plan \(NZTP\)](#) framework, to achieve their net-zero commitments. These rely on governments, state-owned enterprises, and corporates undertaking similarly ambitious transition planning, in which the GFANZ NZTP framework is also applicable. As such, we hope that a broad set of stakeholders — regional and global, public and private — will engage with this guidance in APAC and beyond.

2 GFANZ uses the term “orderly transition” to refer to a net-zero transition in which both private-sector action and public-policy changes are early and ambitious, thereby limiting economic disruption related to the transition (e.g., mismatch between renewable energy supply and energy demand). For reference, the Network for Greening the Financial System (NGFS), which develops climate scenarios used by regulators and others, defines “orderly scenarios” as those that assume “climate policies are introduced early and become gradually more stringent,” as opposed to disorderly scenarios that explore “higher transition risk due to policies being delayed or divergent across countries and sectors”. In an orderly transition, both physical climate risks and transition risks are minimized relative to disorderly transitions or scenarios where annual emissions do not decrease until 2030 or when net zero is achieved by 2050 but with higher costs due to divergent policies introduced across sectors leading to a quicker phase out of oil use.” (NGFS, [Climate Scenarios for Central Banks and Supervisors](#), 2022). The Paris Agreement, Article 4.1, highlights that achievement should be “on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty,” and the agreement acknowledged that “human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity” are equally important.

3 ILO. [Climate change and financing a just transition](#). A just transition involves maximizing the social and economic opportunities of climate action while minimizing and carefully managing any challenges through effective social dialogue and stakeholder engagement.

4 GFANZ. [The Managed Phaseout of High-emitting Assets](#), 2022.

**Purpose:** Recognizing the nascent state of MPO transactions globally and in the region, this report **offers a principles-based approach (rather than prescribing specific actions or plans)** in the form of **voluntary guidance**. Financial institutions are encouraged to use the guidance where possible, but not superseding jurisdictional requirements, or contractual requirements, including mandates with clients. Some types of financial institutions may also have unique legal or regulatory constraints that may differ by jurisdiction and impact the extent to which individual elements of this guidance should be considered.

**We expect this approach will evolve over time as lessons are learned and policies, economics, and technology around the energy transition continue to develop.** The near-term objective **is to establish an ambitious but practical foundation to support catalytic and pioneering coal phaseout transactions involving both public and private finance.** Financial institutions would find it more feasible to participate in such transactions if global public sector organizations, such as the Group of Twenty (G20), agreed on a common framework for MPO, with specific thresholds for an appropriate level of ambition, as part of a wider articulation of a global approach to transition finance.

This report builds on recent work by GFANZ and partners, and advances tools and frameworks published in 2022 and 2023, including:

- The GFANZ report (November 2022) “[Recommendations and Guidance on Net Zero Transition Plans for Financial Institutions](#),” which outlines four net-zero aligned financing strategies, of which MPO is one. The report also lays out a framework for credible transition planning by financial institutions (and a related [publication provides guidance to help real economy firms develop net-zero transition plans](#)).
- The GFANZ report (June 2022) “[Managed Phaseout of High-emitting Assets](#),” which sets out a preliminary and high-level approach to identify assets where MPO could be appropriate, along with an overview of potential financial mechanisms and initial guidance on features of a credible asset-level phaseout plan.
- The working paper (November 2022) by Climate Bonds, CPI, and RMI on “Guidelines for Financing a Credible Coal Transition,”<sup>5</sup> which introduces a framework to help funders and coal plant owners assess the climate and social outcomes of financial mechanisms that support MPO of CFPPs.

5 Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022.

- Two working papers (January 2023) by RMI and commissioned by GFANZ: “Managed Coal Phaseout: Metrics and Targets for Financial Institutions,”<sup>6</sup> which suggests metrics to potentially remove barriers and accelerate financial institution involvement by demonstrating that their financing of MPO of CFPPs leads to real-economy decarbonization and “Financing Mechanisms to Accelerate Managed Coal Power Phaseout,”<sup>7</sup> which sets out how, where, and when financial institutions can use different financing mechanisms in MPOs of CFPPs.
- The “ASEAN Taxonomy for Sustainable Finance Version 2”<sup>8</sup> (March 2023), which builds on Version 1 and accommodates coal power phaseouts.
- The “Singapore-Asia Taxonomy Fourth Consultation Paper”<sup>9</sup> (July 2023) developed by the Green Finance Industry Taskforce (GFIT), convened by the Monetary Authority of Singapore (MAS), which details thresholds and criteria for financing the early phaseout of coal-fired power plants.

This report also considers and seeks to complement the development within the region of various initiatives where MPO of CFPPs is a focus or critical element, specifically:

- ADB’s Energy Transition Mechanism (ETM), which seeks to build on a market-based approach to retire coal power assets on an earlier schedule than if they remained with their current owners, through partnership with member countries.
- country-led platforms for energy transition, and in particular the Indonesia and Vietnam Just Energy Transition Partnerships (JETPs), where MPO is one of the key means by which — alongside investment in grid, battery storage, and renewables — energy sector decarbonization can be delivered.

In offering guidance for net-zero-committed financial institutions to support and finance MPO strategies, the intention is to support existing regional initiatives as well as those in a wider set of countries across the region.

6 RMI. [Managed Coal Phaseout: Metrics and Targets for Financial Institutions](#), 2023.

7 RMI. [Financing Mechanisms to Accelerate Managed Coal Power Phaseout](#), 2023.

8 ASEAN Taxonomy Board. [ASEAN Taxonomy for Sustainable Finance, Version 2](#), 2023.

9 Green Finance Industry Taskforce (GFIT). [Fourth Taxonomy Consultation Paper](#), 2023.

# Executive Summary

**It is well established that accelerating the transition away from unabated coal power is crucial to meet Paris Agreement commitments to combat climate change.**

To avoid the most severe consequences that climate change will bring, greenhouse gas (GHG) emissions need to be significantly reduced and almost halved by 2030 to limit global warming to 1.5 degrees C above pre-industrial levels.<sup>10</sup> Coal power generation is the largest source of carbon dioxide emissions globally<sup>11</sup> — indeed, if existing coal power assets continue to operate as planned, they alone will generate enough emissions to exhaust two-thirds of the remaining carbon budget associated with limiting warming to 1.5 degrees C by the end of this century.<sup>12</sup> The IEA Net Zero Emissions by 2050 (NZE) Scenario involves a 55% reduction in emissions associated with coal by 2030 and a full phaseout of unabated coal in power generation by 2040.<sup>13</sup>

**Globally there is increasing momentum behind the scaling of renewable power and transition away from coal and it is important that APAC countries are part of the charge.** Countries with ambitious plans for transition can seize the economic opportunities associated with the net-zero future, including developing local comparative advantages in new technologies and net zero-aligned activities. As the world transitions to net zero, countries showing leadership are more likely to attract foreign direct investment, be embedded in global supply chains, and readily access net-zero committed finance. The main technologies needed to transition from coal power are

tried and tested, and renewables — particularly wind and solar — are now the cheapest source of power in most markets.<sup>14</sup> Global support for transition in low- and middle-income APAC countries makes sense given the low cost per tonne of avoided emissions.

**APAC countries face certain challenges in transitioning, which need to be overcome urgently.**

Although coal power usage globally is set to plateau through 2025 at current all-time highs,<sup>15</sup> it is expected to continue to rise in Asia for several more years. This is due to high dependencies on coal, with the region also home to four of the top eight coal-producing countries globally<sup>16</sup> reinforced by domestic energy policies, and rising electricity demand driven by economic development and fast-growing populations and income levels. APAC CFPPs are relatively young and typically insulated in some form from market forces, such as through state ownership, limited open power markets, and fiscal and energy policies including fossil fuel subsidies and long-term power purchase agreements (PPAs) with considerable remaining time to run. Additionally, there are near-term costs associated with investing in the transition to renewables; these costs include addressing accelerated coal phaseout, investing in the grid and battery storage infrastructure needed for systems with increased variable renewables, and delivering a pipeline of renewables projects at sufficient scale. Some APAC countries face a high cost of capital — reflecting perceived risks and returns — that may also inhibit capital investment and slow the transition.

10 IPCC. [Press Release: Urgent climate action can secure a liveable future for all](#), 2023.

11 IEA. [CO2 emissions in 2022](#), 2023.

12 IEA. [Coal in net zero transitions](#), 2022. Plant-by-plant assessment of current CFPP fleet assuming remaining technical lifetime of 50 years (without any CCUS or cofiring) and recent levels of operation results in 330 Gt CO2 emissions that could be emitted from 2022 to 2100 (with APAC contributing almost 90%) – equal to two-thirds of 500 Gt CO2 remaining cumulative emissions budget consistent with a 50% chance of limiting average global temperature warming to below 1.5 degrees C.

13 IEA. [World Energy Outlook](#), 2023.

14 BloombergNEF. [1H 2023 Levelized Cost of Electricity update](#), 2023. New onshore wind or solar is the cheapest source of power in markets representing 96% of global electricity generation.

15 IEA. [Coal in 2022: Analysis and forecast to 2025](#), 2023; IEA. [Coal Market Update – July 2023](#), 2023.

16 World Bank. [Global Perspective on Coal Jobs and Managing Labor Transition out of Coal](#), 2021.

**Public policy on coal phaseout is strengthening globally and regionally, but there is significant need for higher ambition.** Globally, 151 countries (42 countries in APAC) have made carbon neutrality and net zero targets,<sup>17</sup> yet work remains to translate these into sufficiently ambitious Nationally Determined Contributions (NDCs) and related policy.<sup>18</sup> Through the Glasgow Pact, almost 200 countries committed to accelerating efforts toward the phasedown of unabated coal power and phaseout of inefficient fossil fuel subsidies, and 98 countries had committed ahead of COP27 to ‘no new coal’ or had no planned coal projects. Nonetheless, 93% of planned coal project capacity as of early 2023 was in APAC.<sup>19</sup> To have the highest confidence that early closure of a CFPP will result in decarbonization that is not later wholly or partially reversed, there would need to be both a governmental commitment to (1) ‘no new coal’ and (2) a coal phaseout date, both ideally aligned with a science-based pathway (such as the IEA NZE Scenario). However, few jurisdictions within APAC have made such commitments as of today. While government-level considerations and the enabling policy environment are fundamental in addressing moral hazard and emissions leakage risks, it is also important to note that government, entity and asset-level considerations are interdependent. This guidance sets out other elements of government-level, entity-level or asset-level plans that, in combination, may still give a high degree of confidence in the decarbonization impact of coal phaseout transactions.

**Financing conditions for coal are tightening.** Major economies, including China, and MDBs and Development Financial Institutions (DFIs) have announced the end of cross-border coal financing, and more than 200 globally significant financial institutions have formal policies restricting investment in coal.<sup>20</sup> However, where individually developed coal policies designed to support net-zero transition also exclude financing to those countries and

entities which have credible plans to accelerate the phaseout of coal, the policies could inadvertently hinder phaseout efforts and the achievement of climate goals. It is crucial that financial institutions can engage in and support credible, financially viable and inclusive MPO plans for coal assets, and that their net-zero transition plans and internal coal policies accommodate this. This report aims to set out guardrails that can provide confidence to participating financial institutions that such plans are sufficiently science-aligned, measurable and time-bound, deliver real world emissions reductions, address broader socio-economic impacts, and support efforts toward interim emission reductions. The report also provides the basis for net zero alliances, standard setters and financial authorities to ensure their frameworks capture MPO and set out specific thresholds.

**The phaseout of coal power is a systemwide challenge requiring a systemwide approach to maintain energy security while mitigating risks to communities — which we need to start developing now.** There are approximately 5,000 CFPP units in APAC, and it will take time to develop and implement the means to accelerate phaseout of such a large number of assets. Significant public and private capital in APAC is invested in existing coal assets which may be sheltered from market forces, or in a very few cases remain competitive in the near term against clean power alternatives. The need to pursue — and finance — phaseout while securing affordable access to reliable energy supply, often in the face of increasing demand, requires careful planning. In particular, planning to reduce coal dependencies and accelerate investment in renewable energy and related modern, smart (and often cross-border) grid infrastructure, while addressing the impacts on affected workers and communities.

17 NewClimate Institute, Oxford Net Zero, Energy & Climate Intelligence Unit and Data-Driven EnviroLab. [Net Zero Stocktake 2023](#), 2023.

18 Also see World Resources Institute. [The State of Nationally Determined Contributions](#), 2022. Findings show even if countries achieved their NDCs, they would reduce GHG emissions by just 7% from 2019 levels by 2030, in contrast to the 43% associated with limiting temperature rise to 1.5 degrees C.

19 Global Energy Monitor. [Global Coal Plant Tracker](#), 2023.

20 IEEFA. [200 and counting: Global financial institutions are exiting coal](#), 2023.

**Alongside public policy, there is a recognized role — and pressing need — for innovative financing mechanisms to support accelerated phaseout.**

The combination of clean power deployment and accelerated fossil power phaseout is expected to bring economic benefits that far outweigh the costs of transition.<sup>21</sup> But given the upfront investment requirement, near-term financing solutions are needed to enable the benefits of, and overcome barriers to, coal phaseout. Financing may be used to acquire coal assets for early phaseout, or to incentivize and enable existing CFPP owners to significantly shorten the plants' operating lives.

**Concessionary forms of finance will often be necessary to crowd-in private finance.** Public and private capital may need to be combined to deliver (i) some degree of cost / burden sharing to address stranded asset risks; (ii) refinancing that lowers the cost of capital; and (iii) alternative revenue streams (e.g., from renewables projects pursued to provide replacement energy and relevant carbon credits). Additional finance and grants are likely needed to address just transition considerations. Philanthropic, public, and MDB / DFI capital will need to play a role: according to the Energy Transitions Commission, concessional / grant funding needs for low and middle income countries (excluding China) to accelerate the phaseout of coal may be \$25 billion-\$50 billion per year (alongside private finance).<sup>22</sup> Governments can issue sovereign bonds to provide blended finance for MPOs and show their commitment to climate targets, while MDBs and other development banks can expand their role as funders to provide de-risking and / or credit support facilities in addition to becoming anchor lenders or investors (see **ADB ETM case study**).

***MPO as a key financing strategy for the net zero transition***

Voluntary guidance developed by [GFANZ on net-zero transition planning \(NZTP\)](#) for financial institutions and companies recognized MPO as one of four key financing strategies through which financial institutions can finance decarbonization in support of the transition to net zero.<sup>23</sup> The strategies are:

- 1) **Climate solutions:** Financing or enabling entities and activities that develop and scale climate solutions.
- 2) **Aligned:** Financing or enabling entities that are already aligned to a 1.5 degrees C pathway.
- 3) **Aligning:** Financing or enabling entities committed to transitioning in line with 1.5 degrees C-aligned pathways.
- 4) **Managed phaseout (MPO):** Financing or enabling the accelerated managed phaseout (e.g., via early retirement) of high-emitting physical assets.

Other strategic options for transitioning CFPPs, as part of one of the other three financing strategies noted above, such as investment in retrofitting and repurposing may also play a role, but are not the focus of this report. For example, the IEA's *Coal in Net Zero Transition* report outlines the potential role for retrofitting CFPPs to allow for flexible operations (i.e., shift to a lower-utilization peak / balancing role), energy efficiency or carbon capture measures,<sup>24</sup> or repurposing to co-fire with low-carbon fuels. These might, in certain circumstances, be considered as 'Aligning' strategies and could be undertaken alongside MPO.<sup>25</sup> More guidance for these alternative approaches, including definitions and metrics, may be required for consideration as part of credible transition financing (see **Box 6**).

21 IMF. [The Great Carbon Arbitrage](#), 2022.

22 Energy Transitions Commission. [Financing the Transition: How to make the money flow for a net-zero economy](#), 2023.

23 See GFANZ. [Scaling Transition Finance and Real-economy Decarbonization](#), 2023. This report provides supplemental information on the four key transition financing strategies to support and scale their adoption and thus inform net-zero transition plans; and proposes complementary, forward-looking approaches to evaluate the decarbonization contribution potential of exposures that may be considered alongside other metrics and targets established within net-zero transition plans.

24 Carbon capture, utilization and storage (CCUS) is the process of capturing carbon dioxide emissions from fuel combustion, industrial processes or directly from the atmosphere. Available CCUS technologies for coal power plants include pre-combustion, oxy-combustion and post-combustion (IEA. [Coal in net zero transitions](#), 2022).

25 IEA. [Coal in net zero transitions](#), 2022.

To be clear, transitioning power sectors to net zero will not be achieved by coal phaseout alone but through a combination of scaling alternative sources of clean power, grid infrastructure upgrades making efficiency improvements, and the potential use of carbon capture and storage.

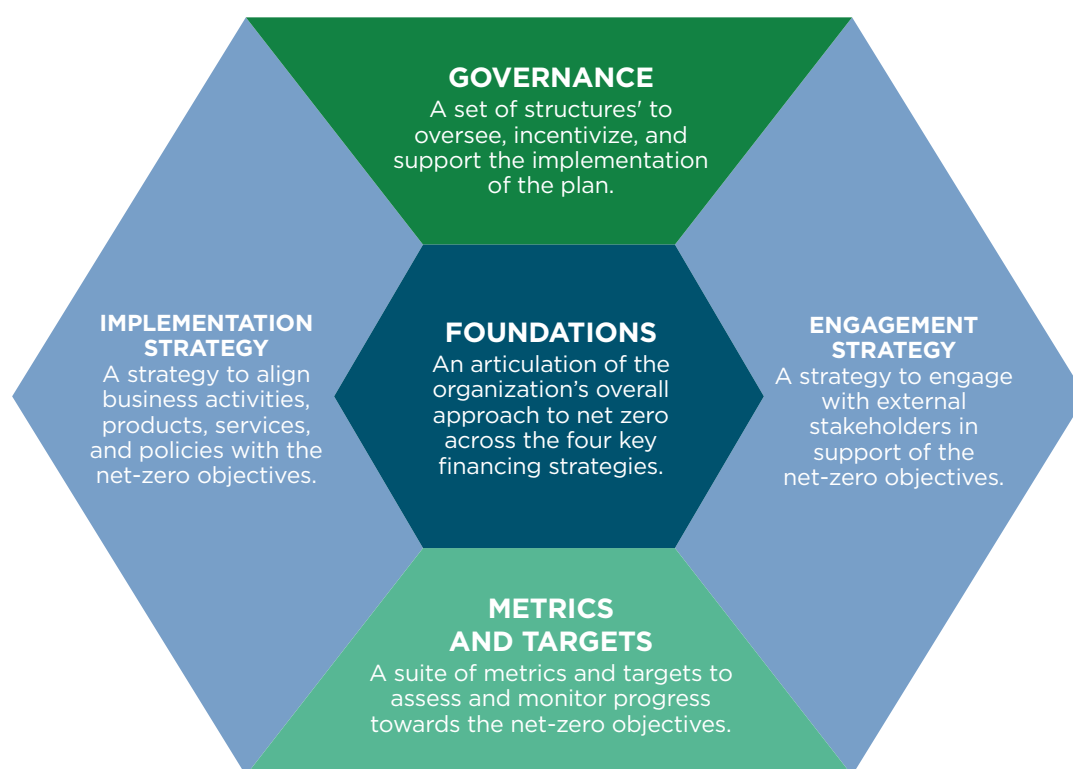
**Recommendations to support financing the MPO of CFPPs**

GFANZ [Expectations for Real Economy Transition Plans](#) serves as a practical guide for real economy companies when building transition plans articulating their overall approach to the net-zero transition and disclosing progress against them (**Figure 1**).

A CFPP MPO plan (coal phaseout plan) may form part of the plant owner / operator's overall transition plan. It is key for coal asset owners / operators to have clear commitments in their transition plans around the early retirement of plants on a science-based timeframe.

GFANZ welcomes related work by policymakers and regulators on the role of transition planning to support an orderly and just transition. This includes building on and supporting convergence around common market-based approaches, such as those developed by GFANZ in this report. It will be important to ensure that where official sector requirements and frameworks are developed, they can capture plans for managed phaseout.

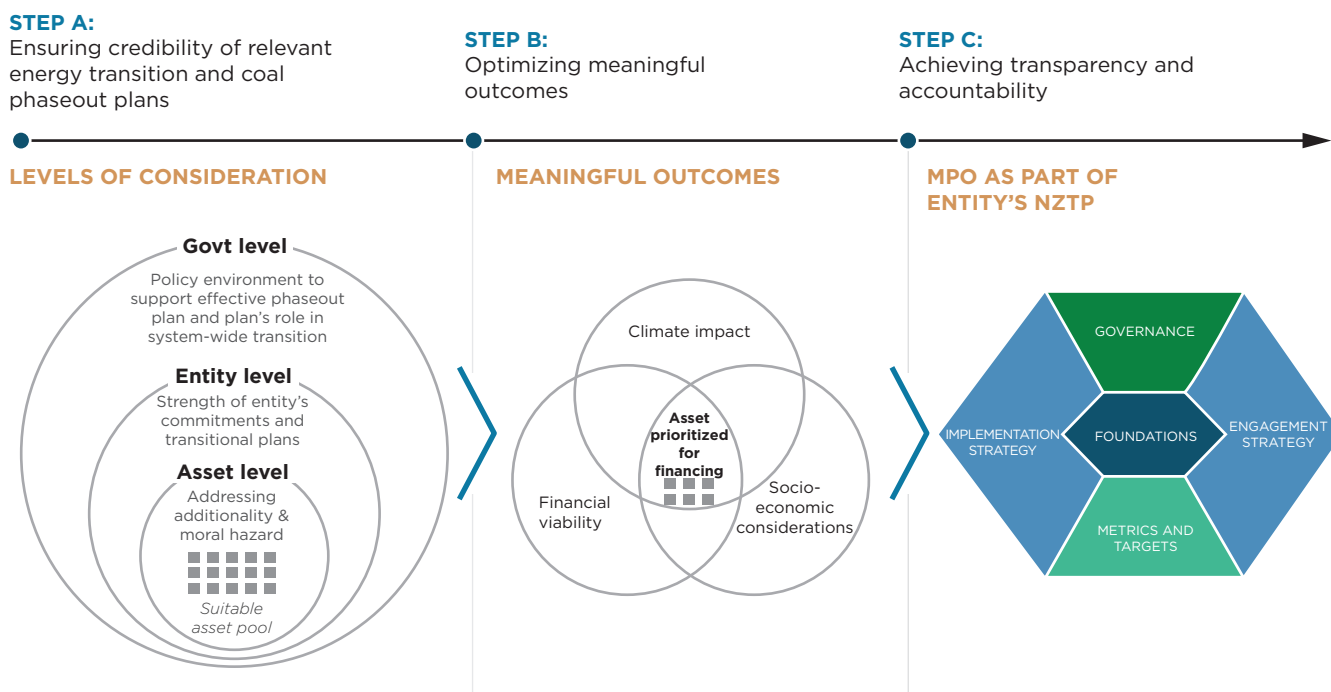
**Figure 1: GFANZ Net Zero Transition Plan Framework**



GFANZ proposes a three-step process (**Figure 2**) with ten recommendations for entity-produced coal MPO plans that will support financial institutions', and others', assessment of these plans. The steps are:

- Ensuring the credibility of relevant energy transition and coal phaseout plans by considering plans at the governmental, entity and asset levels;
- Optimizing 'meaningful' outcomes across climate impact, financial viability and socio-economic considerations; and
- Achieving transparency and accountability for coal phaseout plans in line with the [GFANZ NZTP framework](#).

**Figure 2: Proposed three-step process for consideration of coal phaseout plans**



### Step A: Ensuring credibility of relevant energy transition and coal phaseout commitments and plans

Given the challenges associated with delivering successful MPO transactions, financial institutions will be informed by various levels of energy transition and coal phaseout commitments and plans in deciding whether to provide financing. Typically, considerations start at the government level as that provides a basis for what financial institutions might then expect to see at the entity and asset level. Government level considerations are also fundamental in addressing 'emissions leakage' (i.e., that closure of a CFPP occurs but is offset by increased operation of other CFPPs or

new CFPPs) and moral hazard (e.g., that a phaseout transaction perversely encourages more coal power generation in order to later benefit from a potential coal phaseout plan).

At the same time, it is important to note that these levels are interdependent, such that more detailed or stronger plans at one level may give comfort around fewer requirements that may be present at other levels. Taken together, sufficiently ambitious and credible commitments and planning at the government, entity and asset levels can help to address the risks of 'emissions leakage' or moral hazard.

- **Government-level considerations**

- **Recommendation 1 (Government climate commitments):** Financial institutions should assess the nature, strength and stability<sup>26</sup> of the energy sector transition commitment of the government of the country in which the CFPP is located. Specifically, this could include the degree of alignment with 1.5 degrees C science-based pathways (i.e., national-level ‘no new coal’ policies or specific coal phaseout date commitments).
- **Recommendation 2 (Government energy transition planning):** Financial institutions should assess the extent to which there is an existing or emerging plan (including but not limited to commitment through country platforms or alignment with science-based pathways) for the energy / power system that addresses how coal phaseout will be delivered alongside necessary investment in grid infrastructure and renewables, in the country in which the CFPP is located.

- **Entity-level<sup>27</sup> considerations**

- **Recommendation 3 (Entity coal transition plan):** Financial institutions should assess the relevant entity’s overall transition plan (both seller and buyer where applicable) — including but not limited to the specific CFPP — to gain confidence that a coal phaseout plan will be implemented and effectively mitigate emissions (e.g., an entity-level commitment to ‘no new coal’, or credible third-party-verified transition plan).

- **Asset-level considerations**

- **Recommendation 4 (Addressing moral hazard):** Financial institutions should assess conditions and commitments made in relation to a CFPP subject to an MPO plan (such as whether a plant was commissioned prior to thresholds put forth by taxonomies, or international or national commitments to phase out coal; i.e., 2021 Glasgow Climate Pact) to gain confidence that the risk of moral hazard is significantly contained.
- **Recommendation 5 (Accelerating phaseout):** 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).

### **Step B: Optimizing ‘meaningful’ outcomes across climate impact, financial viability and socio-economic considerations**

- **Climate impact**

- **Recommendation 6 (Climate impact):** Financial institutions should prioritize financing MPO plans that support alignment with a science-based pathway, with proposed emissions reductions as ambitious as possible, with public-sector endorsement or independent verification, and in line with timeframes set out by internationally recognized bodies.

- **Socio-economic considerations**

- **Recommendation 7 (Accessible, affordable clean energy):** Financial institutions should assess what measures are in place to support access to secure, reliable and affordable clean energy replacements, such as having feasibility and cost assessments of clean energy replacements, with actions underway to deliver them.

26 For example, the broader the political support for climate / energy transition policies, the more enduring and stable the commitment is likely to be.

27 Where the CFPP continues to be owned and operated by its pre-MPO owner, that owner is the relevant entity. Some MPO transactions will involve a transfer of ownership and in such cases, the relevant entity may be the new owner(s).

- **Recommendation 8 (Mitigating adverse socio-economic impacts):** Financial institutions should assess what measures are in place to mitigate adverse socio-economic impacts, such as having (i) environmental and social risk and impact assessments; (ii) social dialogue and stakeholder engagement; (iii) worker and community transition plans; (iv) environmental restoration and land repurposing plans; and (v) adverse impact fund (or similar support measures).
- **Financial viability**
  - **Recommendation 9 (Holistic financial viability analysis):** Financial institutions should perform holistic financial viability analysis of a coal phaseout plan to ensure it is likely to be viable, including capturing the financial impact of socio-economic support measures and associated costs.

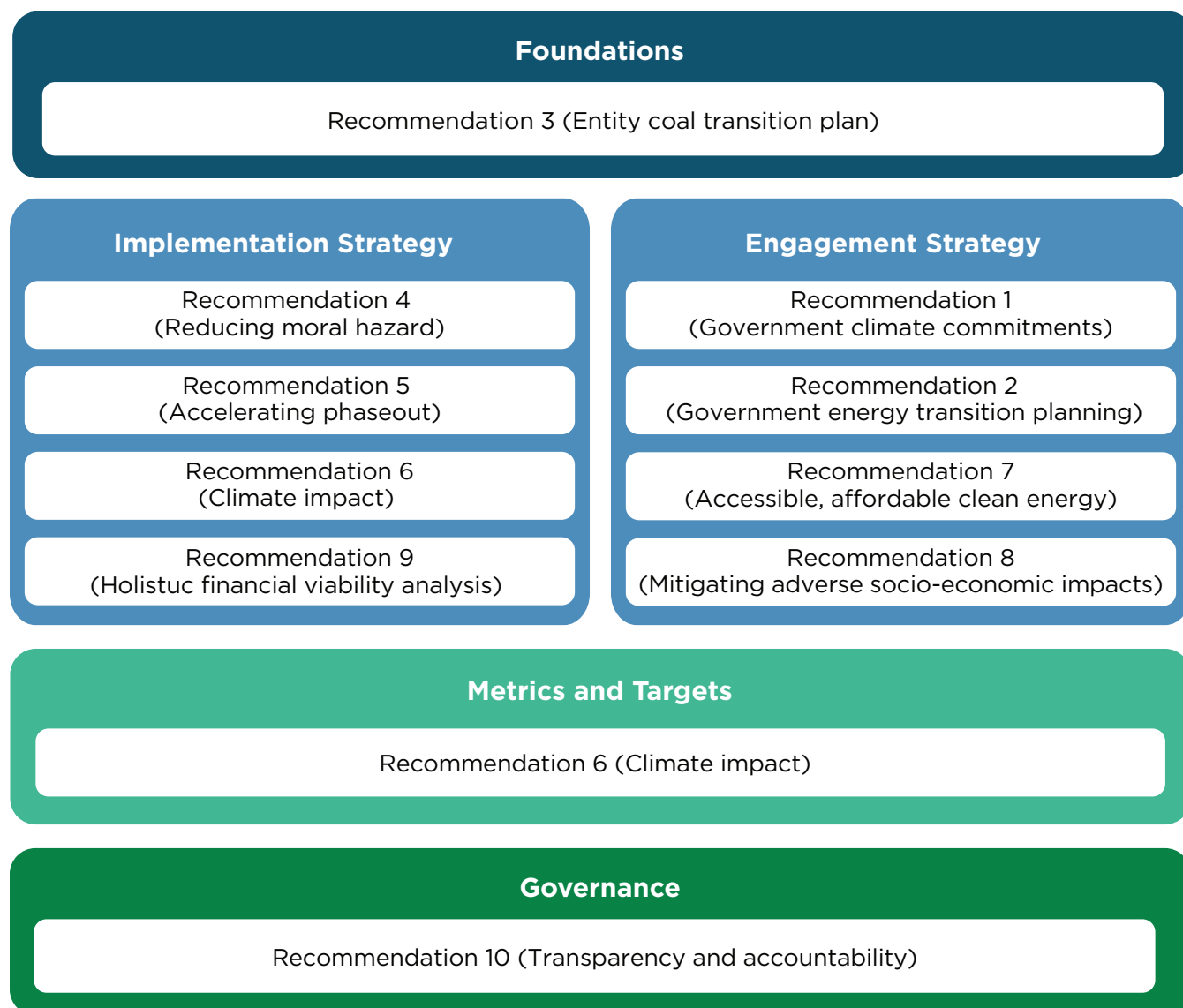
**Step C: Achieving transparency and accountability for coal phaseout plans referencing the [GFANZ NZTP framework](#)**

- **Recommendation 10 (Transparency and accountability):** Financial institutions should set expectations that the entity's CFPP phaseout plan covers the key components of the [GFANZ Real Economy NZTP framework](#) and consider additional reporting on governance measures.

These ten recommendations have been mapped to the key components of the [GFANZ NZTP framework](#) in **Figure 3**, to show how an entity-produced CFPP phaseout plan could capture them. GFANZ also welcomes related work by policymakers and regulators on the role of transition planning to support an orderly and just transition.

In addition to these ten recommendations, the success of coal phaseout plans and transactions will be aided if:

- national authorities set out **transition plans for their power systems**;
- financial authorities provide **supervisory expectations** on credible transition planning in a manner that supports financing the transition of high-emitting sectors;
- financial institutions review their **coal power policies** to allow for credible participation in MPOs as one of their financing strategies;
- **country platforms** incorporate MPO for coal power to catalyze private finance alongside public finance sources to support climate objectives.

**Figure 3: Coal phaseout recommendations mapped to [GFANZ NZTP framework](#)**

# Part 1: Context and APAC landscape

## The net-zero backdrop

### To avoid the most severe climate change outcomes requires substantial GHG emissions reductions

The Paris Agreement signified a global effort to combat climate change. The agreement's overarching goal is to limit global warming to well below 2 degrees C and to pursue efforts to limit warming to 1.5 degrees C above pre-industrial levels.<sup>28</sup> Global warming has already reached ~1.1 degrees C above pre-industrial levels, and each incremental overshoot of the 1.5 degrees C is expected to bring more severe consequences — from more intense flooding and heat waves, to greater biodiversity loss and food insecurity.<sup>29</sup> The Intergovernmental Panel on Climate Change (IPCC) concludes that while warming can still be limited to 1.5 degrees C, this would require immediate and substantial efforts to cut emissions almost in half by 2030 as compared with 2019 levels.<sup>30</sup>

### This will require an early and significant scaling of clean power and shift away from coal power generation

Deployment of clean power has accelerated in recent years as costs have fallen, but still remains only ~30% of global power generation.<sup>31</sup> Globally, coal remains the largest source of power generation and is the largest single source of carbon dioxide (CO<sub>2</sub>) emissions.<sup>32</sup> Reducing dependency on coal for power will play a critical role in global efforts to bear down on emissions. The current global energy crisis, and in particular reduced availability of fossil gas, has seen some countries increase their use of coal despite climate and

energy transition targets. Emissions from burning coal reached a record high in 2022.<sup>33</sup>

### The world cannot continue to use coal as it has done if we are to meet global carbon budgets

The IEA notes that existing coal power assets operating as normal would generate enough emissions to exhaust two-thirds of the remaining 'carbon budget' associated with limiting average global temperature warming to below 1.5 degrees C by the end of this century, with APAC coal power assets contributing almost 90% of these emissions.<sup>34</sup> Early and significant reductions in coal-related emissions are part of every credible pathway that avoids severe impacts from climate change. The IEA NZE Scenario calls for a 55% cut by 2030 and full phaseout of unabated coal in power generation by 2040.

### Rising populations and economic growth are driving power demand

Many APAC countries have fast-growing populations and income levels. This, alongside electrification of economies in support of the transition and for access to affordable and resilient power, will result in high growth in power demand. The IEA estimates growth of 35% by 2030 and 100%-130% by 2050.<sup>35</sup> A lack of cross-border power connectivity in the APAC region makes self-sufficiency in power generation necessary, yet there is significant potential for enhanced grid connectivity and cross-border electricity trade to reduce CFPP dependence and diversify the energy mix.<sup>36</sup>

28 UNFCCC. [The Paris Agreement](#).

29 IPCC. [Special Report on Global Warming of 1.5 °C](#), 2018.

30 IPCC. [Synthesis Report \(SYR\) of the IPCC Sixth Assessment Report \(AR6\)](#), 2023.

31 IEA. [Electricity Market Report](#), 2023.

32 IEA. [CO<sub>2</sub> emissions in 2022](#), 2023.

33 BloombergNEF. [New Energy Outlook](#), 2022.

34 IEA. [Coal in net zero transitions](#), 2022. Plant-by-plant assessment of current CFPP fleet assuming remaining technical lifetime of 50 years (without any CCUS or cofiring) and recent levels of operation results in 330 gigatonnes (Gt) CO<sub>2</sub> emissions that could be emitted from 2022 to 2100 – equal to two-thirds of 500 Gt CO<sub>2</sub> remaining cumulative emissions budget consistent with a 50% chance of limiting average global temperature warming to below 1.5 degrees C.

35 IEA. [World Energy Outlook, 2022](#). Table 6.2.

36 UNESCAP. [Regional road map on power system connectivity](#), 2019.

**APAC has high coal dependency...**

Coal dependency in APAC is high (ranging from ~34% of power generation in Japan and South Korea, to ~61% in China and Indonesia, and ~74% in India)<sup>37</sup> and transitions are likely to be particularly challenging, given the heavy investment in coal power and the need to secure affordable power supply amid growing demand (see **Box 1**). IEA's Coal Transition Exposure Index (CTEI) of major coal-producing and consuming countries ranked APAC markets among the top five markets with particularly heavy and multi-faceted dependence on coal.<sup>38</sup>

While coal power usage globally is close to peaking, it is expected to continue to rise in Asia, with the IEA forecasting growth from 2022 to 2025 of 5% in China, 7% in India, and 14% in Southeast Asia to meet rising demand for electricity.<sup>39</sup>

There remains a significant pipeline of CFPPs to be built, with APAC accounting for 93% of the global pipeline, which would increase current APAC capacity by 32% (as of January 2023).<sup>40</sup> The IEA NZE Scenario calls for no new investment decisions for the construction of coal-fired power (see **Box 2** for example of Indonesian state-owned power company PLN's pipeline cancellations).

The risks of electricity "oversupply" are also to be recognized in power sector planning. A study in several Southeast Asian markets finds that coal power fleet

expansion, combined with generation from renewable capacity targets and existing power capacity, may exceed future national electricity demand — likely resulting in underutilization and / or stranding of such assets while also potentially crowding out renewable energy deployment.<sup>41,42</sup> For example, the average utilization rate of coal plants in China has fallen from 70% during 2002-06 to 53% in 2022.<sup>43</sup> Moreover, the risk of asset stranding to meet the Paris Agreement goals is significant: if all proposed coal plants are built as scheduled, stranded assets may reach \$1.4 trillion under a 1.5 degrees C policy and \$1 trillion under 2 degrees C — with such stranded asset risks falling disproportionately on emerging Asian economies with newer and growing coal fleets.<sup>44,45</sup>

**...making early retirement of coal power generation critical for decarbonization**

APAC accounts for around half of global GHG emissions, of which the largest contributor is power generation at ~40% of APAC's GHG emissions.<sup>46</sup> Around half of all power generated in APAC comes from coal: approximately 5,000 CFPP units, where subcritical plants make up the largest at ~45% share of capacity. For APAC overall, CFPPs collectively emit 7.2 gigatonnes (Gt) CO<sub>2</sub> annually, or around 20% of the 36.8 Gt in annual global energy-related CO<sub>2</sub> emissions.<sup>47</sup>

37 Ember. [Electricity Data Explorer](#), 2022.

38 IEA. [Coal in Net Zero Transitions](#), 2022. CTEI is a typology of major coal producing and consuming country exposure to the global clean energy transition. Top 5 markets are Indonesia, Mongolia, China, Vietnam, and India among a sample of 21 countries representing >90% of global coal production and consumption. Dependence on coal looks at four categories: energy dependence, development gap, economic dependence and lock-in.

39 IEA. Coal 2022: [Analysis and forecast to 2025](#), 2022.

40 Global Energy Monitor. [Global Coal Plant Tracker](#), 2023.

41 Chen, X., & Mauzerall, D. L. [The expanding coal power fleet in Southeast Asia: Implications for future CO<sub>2</sub> emissions and electricity generation](#), 2021.

42 Also see IEEFA. [Indonesia Wants to Go Greener, but PLN Is Stuck With Excess Capacity From Coal-Fired Power Plants](#), 2021.

43 S&P Global Commodity Insights. [China's record coal capacity approvals in 2022: Will carbon targets still be met?](#), 2023.

44 Morgan R Edwards et al. [Quantifying the regional stranded asset risks from new coal plants under 1.5C](#), 2022.

45 Also see Carbon Tracker. [Economic and financial risks of coal power in Indonesia, Vietnam and the Philippines](#), 2018. Analysis found that coal power owners in Vietnam, Indonesia, and the Philippines collectively risk losing up to \$60 billion if coal power is phased out in a manner consistent with the temperature goal in the Paris Agreement.

46 Our World in Data. [CO<sub>2</sub> and Greenhouse Gas Emissions database](#).

47 Our World in Data. [CO<sub>2</sub> and Greenhouse Gas Emissions database](#); [Global Energy Monitor](#). [Global Coal Plant Tracker](#), 2023.

### Box 1: Coal in Asia-Pacific's Net Zero Transition

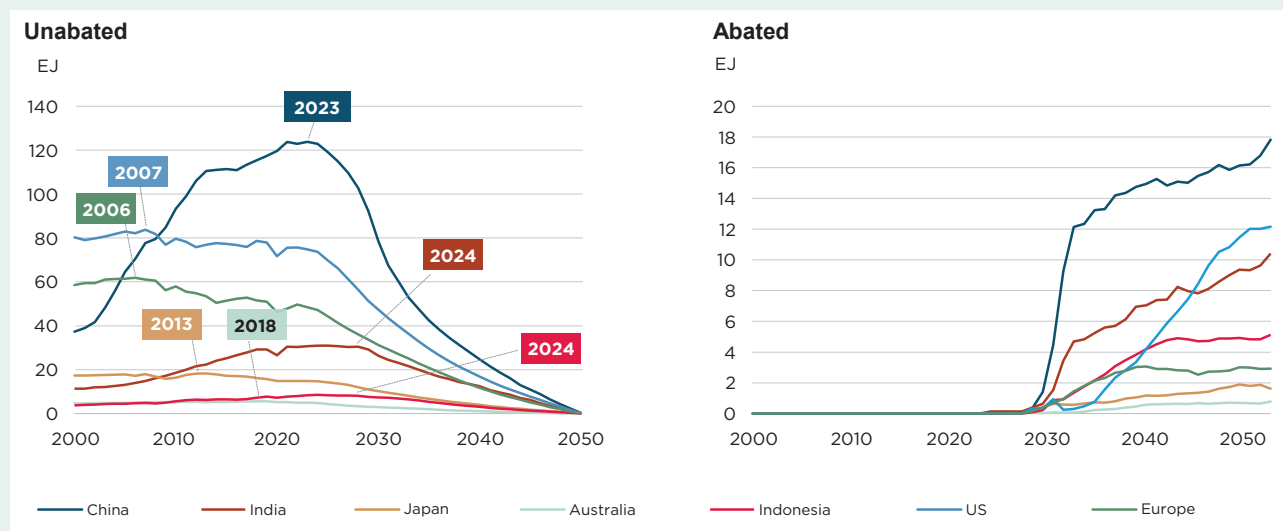
**According to BNEF, a significant share of APAC's coal fleet must be retired early to meet net-zero goals, with the bulk of capacity replaced by wind and solar.**

BloombergNEF's *New Energy Outlook* (NEO) explores energy transition scenarios globally, providing country-level detail for nine key countries including China, India, Indonesia, Japan, and Australia.<sup>48</sup>

**While unabated fossil fuel use has peaked globally, it continues to grow in APAC.**

The NEO indicates that unabated fossil fuel use has already peaked and is on the decline in Europe, the U.S., Japan and Australia (**Figure 4**), but has been growing in much of Asia with new facilities still coming online. Given coal power emissions are still rising in APAC, bringing forward the point at which they peak and lowering the level at which they peak will be key. Making this transition will be better for climate, growth, energy security, health and affordability in the region. In the BloombergNEF Net Zero Scenario, unabated fossil fuels in all countries need to peak within the next two years: 2023 in China, and 2024 in India and Indonesia. From their respective peaks, unabated fossil fuel consumption falls on average per year by 8% in China, 14% in India and 8% in Indonesia.

**Figure 4: Fossil fuel use and peak years for energy use by geography in the BNEF Net Zero Scenario**



Source: BloombergNEF

Note: Does not include use of fossil fuels as feedstock. In the 'Unabated' chart, highlighted years show peak year of unabated fossil fuel consumption. Abated fossil fuel use is energy use where CO<sub>2</sub> emissions from fuel combustion are captured with CCS.

48 BloombergNEF. [New Energy Outlook](#), 2022.

***The scale of coal power retirement to achieve net-zero targets is significant***

Globally, some 111 gigawatts (GW) of coal capacity needs to be retired each year to 2030 if emissions in the power sector are to fall by 57% by 2030 in the Net Zero Scenario. The rate slows to a still-significant 66GW annually thereafter. Some of this capacity may be retrofitted with carbon capture and storage (CCS), although this will depend on age and technical feasibility. In China, an average 46GW of capacity needs to be closed every year through 2030, and then another 40GW each year from 2031 to 2050. In this scenario, India needs to close 10GW each year to 2030, a quarter of its current fleet.

***Limited role for switching to gas or carbon capture retrofits***

Asia sees no significant coal-to-gas switch in the BloombergNEF Net Zero Scenario due to the relatively higher costs of gas compared with coal in the region.<sup>49,50</sup> Instead, it is more economic to switch existing and new plants to abated fossil fuels with CCS. But even then, the potential for abated fossil fuel use is limited: the mitigation impact from using CCS on total emissions reductions is generally lower than 11% across countries. Indonesia is a notable exception, with CCS accounting for 27% of its CO<sub>2</sub> mitigation in the Net Zero Scenario.

***Deployment of clean power drives emissions reductions...***

The NEO suggests the majority of carbon emissions reductions to reach net zero will come from switching to clean sources of power supply and electrifying end-use processes. Cleaning up the power system is most impactful in countries that heavily rely on coal today, such as China (61% share of coal in electricity generation in 2021), India (78%) and Australia (53%). Switching to clean power accounts for at least two-thirds of their total emissions abatement over the next 28 years (see **Figure 5**)

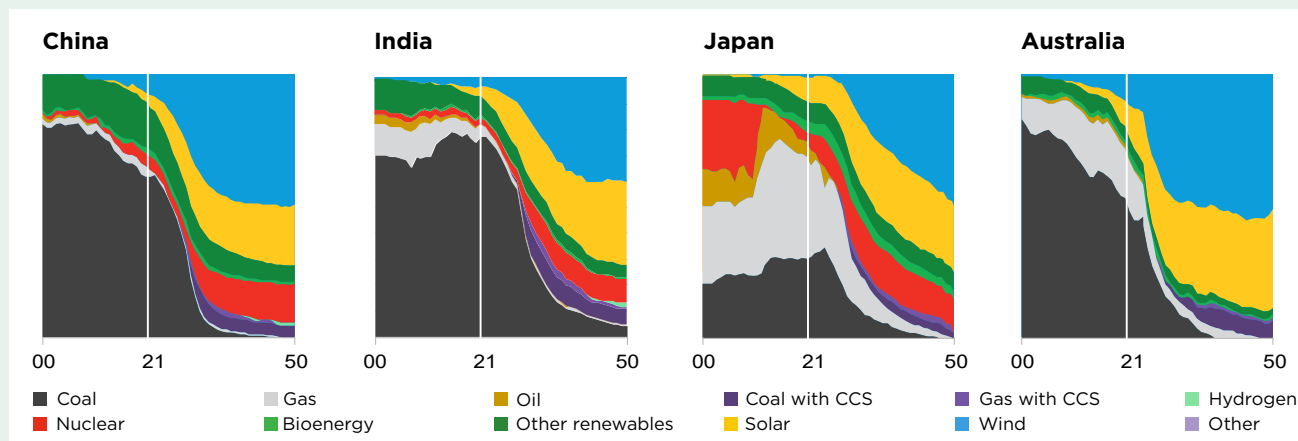
This is supported by the technological advancements in clean power technology. Cheap solar and wind dominate countries' annual build out and installed power capacity in 2050 in the Net Zero Scenario. They provide between 64% to 79% of all capacity, depending on the country, and are accompanied by storage (2% to 11%) and low-carbon dispatchable capacity, such as coal and gas with CCS, nuclear and hydrogen plants (8% to 25%).

The NEO Net Zero Scenario also finds regional differences in clean power generation. Where wind speeds are low or generation profiles are highly seasonal, such as in Southeast Asia, solar tends to perform better. In Indonesia, the projected share of wind in total generation in 2050 is 18%, in India it is 40%; while in Australia and India solar is projected to make up 38% and 32% generation share, respectively.

Other renewables, such as hydro, biomass, geothermal and solar thermal, also provide a complement to wind and solar in the transition to zero emissions. However, they tend to be limited by local resource potential, environmental concerns, and by their costs in the case of biomass, geothermal and solar thermal. Globally, they are projected to meet 7% of demand in 2050.

49 While coal-to-gas switching in the BloombergNEF Net Zero Scenario's power sector modeling accounts for additional gas-fired power plant capacity in pipeline, it is primarily driven by least-cost dynamics (primarily fuel price environment) and does not find gas a cost-competitive solution to meet future electricity demand.

50 Also see BloombergNEF. [Uncertain Role for Gas in Southeast Asia Power Transition](#), 2021. While governments across the region are considering gas power as an alternative to coal power, none of their current plans call for new gas power plants to replace existing CFPPs. Uncertainty around fuel cost, capacity factor, and cost of capital could impact the economics of gas power in the region.

**Figure 5: Electricity generation by source in the BNEF NEO Net Zero Scenario 2000-2050**

Source: BloombergNEF

**Box 2: Example of PLN Strategic Roadmap to Decarbonizing Indonesia's Energy Sector<sup>51</sup>**

Indonesian state-owned power company PLN created a strategic roadmap to gradually reduce the use of fossil energy in power generation. In the short- to medium-term plan, PLN aims to reduce emissions intensity in all scopes by 15.7 % in 2030 based on the 2021-2030 Electricity Supply Business Plan (RUPTL) and reduce absolute GHG emissions by 98 megatonnes (Mt) of CO<sub>2</sub> in 2030. In the long-term plan, PLN aims to reduce emissions intensity from 0.892 tonnes of CO<sub>2</sub> / MWh in 2021 to zero by 2060, and achieve absolute zero GHG emissions in 2060 or sooner.<sup>52</sup>

Between 2021-2022, PLN implemented eight lighthouse initiatives across three categories to support the energy transition roadmap. Overall, PLN's efforts will reduce or avoid cumulative emissions of approximately 3.2 Gt CO<sub>2</sub>.

- **Decarbonization of coal power plants:** PLN's long-term electricity plan (RUPTL 2021-2030) has canceled 13.3 GW of coal power previously scheduled in RUPTL 2019-2028, as well as power purchase agreements for 1.3 GW of coal power scheduled in RUPTL 2021-2030. These initiatives can save approximately 2 Gt of CO<sub>2</sub> emissions that would otherwise be emitted over the lifespan of the coal plant. Other initiatives include planning and financing early retirement of coal plants, implementing biomass cofiring, conducting a pilot study on hydrogen and ammonia, and conducting a study on CCUS.
- **Expanding renewable energy capacity and its supporting system:** PLN plans to build 21 GW of renewable energy plants under the 2021-2030 Green Electricity Supply Business Plan pipeline and roll out smart grids as a support system to meet Indonesia's growing electricity demand for green energy.
- **Developing green ecosystem:** PLN strives to develop green energy as a service, sustainably grow the use of new technologies, and cultivate new businesses related to electric vehicles and rooftop solar power systems.

51 PLN. [Just Energy Transition Partnership \(JETP\) and Decarbonizing Indonesia's Energy Sector](#), 2023.

52 This roadmap follows Indonesia's commitment to achieve Net Zero Emissions by 2060; work to develop a comprehensive JETP Investment and Policy Plan in 2023 to define pathways to achieve new and accelerated targets, such as reaching net zero emissions in the power sector by 2050, is underway.

**APAC is acutely vulnerable to climate change, reinforcing the importance and urgency of coal phaseout**

The APAC region, home to 60% of the world's population, is acutely vulnerable to the physical effects of climate change. The region includes 13 of the 30 nations most exposed to climate hazards. These include food shortages and supply chain disruptions associated with extreme weather, rising sea levels, and heat stress. The World Bank estimates that up to 7.5 million people, in the absence of meaningful policy action, could be pushed into poverty by 2030 due to the climate crisis.<sup>53</sup> Under the IPCC's RCP 4.5 scenario, East Asia and the Pacific could lose up to 5% of GDP by 2050 due to climate change. This figure is starker — 15% — for South Asia.<sup>54</sup> APAC countries need to urgently bear down on emissions to shield themselves from these risks. The phaseout of coal power is a crucial part of this reduction strategy.

**Major APAC nations are committed to net zero, and public policy is moving in the right direction; however, more clarity and ambition is needed**

As of August 2022, 39 of the 49 Asia-Pacific member states addressed in the 2022 ESCAP, UNEP, and UNICEF joint assessment report had made carbon neutrality and net-zero pledges, and had started developing frameworks to implement their commitments.<sup>55</sup> Globally, public policy supporting the reduction of coal use for power generation has strengthened in recent years. The Powering Past Coal Alliance (PPCA), launched at COP23 in 2017, is a coalition of 48 national governments, 49 sub-national governments and 71 global organizations working to advance the transition from unabated coal power

generation to clean energy. It encourages all members to endorse the PPCA Declaration,<sup>56</sup> including a high-level commitment to phase out coal by 2030 in the OECD and EU, and by no later than 2040 in the rest of the world.

At COP26, the Glasgow Climate Pact was adopted by nearly 200 nations that agreed, for the first time, to phase down unabated coal power.<sup>57</sup> Some 45 countries plus the European Union, and including major APAC coal producers and users Indonesia, the Philippines, South Korea and Vietnam, committed to “rapidly scale up technologies and policies in this decade to achieve a transition away from unabated coal power generation in the 2030s (or as soon as possible thereafter) for major economies and in the 2040s (or as soon as possible thereafter) globally”.<sup>58</sup>

More recently, G7 countries have reaffirmed their commitment to the goal of achieving fully or predominantly decarbonized power sectors by 2035, having previously committed to taking “concrete and timely steps towards the goal of an eventual phaseout of domestic unabated coal power generation” and “supporting an accelerated global unabated coal phaseout.”<sup>59,60</sup> Just Energy Transition Partnerships (JETPs) for Indonesia and Vietnam were announced in November and December 2022 respectively to deliver a systems-level approach to implementing increased ambition on financing the energy transition, addressing accelerated MPO of coal-fired power and investing in enabling grid infrastructure and scaling up of renewables (see **Box 3**). Indonesia and China officials held discussions in 2023 about deepening cooperation between the countries on energy transition.<sup>61</sup>

53 World Bank. [Climate change and development in the Asia Pacific Region](#), 2022.

54 WEF. [How hard could climate change hit the global economy, and where would suffer the most?](#), 2022.

55 UNESCAP. [2022 Review of Climate Ambition in Asia and the Pacific: Raising NDC targets with enhanced nature-based solutions](#), 2022.

56 Powering Past Coal Alliance, [PPCA Declaration](#), 2017.

57 UNFCCC. [Report of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement on its second session](#), held in Glasgow from 31 October to 12 November 2021. Addendum.

58 UN Climate Change Conference UK 2021. [Global Coal to Clean Power Transition Statement](#), 2021.

59 [G7 Climate, Energy and Environmental Ministers' Communiqué](#), 2022.

60 [G7 Climate, Energy and Environment Ministers' Communiqué](#), 2023.

61 IESR. [INDONESIA-CHINA Energy Transition Cooperation, First Of Its Kind High-Level Dialogue](#), 2023.

**Coal is becoming increasingly difficult to finance**

The G20 pledged to “put an end to the provision of international public finance for new unabated coal power generation abroad by the end of 2021.”<sup>62</sup> MDBs and DFIs have limited coal finance with 99% of the internationally available development finance committed to reducing or ending coal finance support as of November 2021.<sup>63</sup> Financial institutions representing approximately 40% of global private finance have committed to net zero through the eight

sector-specific alliances that are part of GFANZ.

Analysis by the Institute for Energy Economics and Financial Analysis (IEEFA) shows that ~200 globally significant financial institutions have formal policies restricting investment in thermal coal mining and / or coal-fired power projects.<sup>64</sup> Another recent report suggests coal power financing by the world’s 60 largest banks has fallen by a third from \$44.5 billion in 2018 to \$29.5 billion in 2022.<sup>65</sup>

**Box 3: Indonesia and Vietnam JETPs**

Just Energy Transition Partnerships (JETPs) for Indonesia and Vietnam were announced in November and December 2022 respectively, and the accompanying joint statement<sup>66</sup> and political declaration<sup>67</sup> set out the increased ambition on energy transition. These country-led efforts, which convene relevant stakeholders and technical experts locally and globally, are designed to deliver a systems-level approach to addressing accelerated MPO of coal-fired power alongside investment in enabling grid infrastructure and scaling up of renewables. The political declaration to JETP in Indonesia and Vietnam is to mobilize \$20 billion for Indonesia and \$15.5 billion for Vietnam in the next three to five years.

The Indonesian and Vietnamese governments will conduct national-level transition planning aligned with the increased ambition agreed in the JETPs, with input from international partners. Planning will address how to accelerate the phaseout of coal-fired power over time, and the joint statement and political declaration confirm the intent to review coal policy and assets, pause planned on- and off-grid coal power projects, and seek alternative energy sources.<sup>68</sup>

The country-led energy transition planning, and the process of developing relevant projects and structuring their financing, receive input from international partners, including technical bodies, MDBs, and other international partners. This multi-stakeholder approach can help to address some of the challenges around designing and implementing coal phaseout transactions, providing confidence to both public and private financial institutions.

While JETPs are not binding international agreements nor designed to facilitate the broad sectoral transition, they are a financially sizable step towards accelerating low-carbon transition efforts. For coal phaseout, the JETPs can help establish the technical, financial and social basis, and in the process develop a replicable model for MPO transactions. In this way they can accelerate the momentum for the energy transition, while enabling further financial flows into the two countries and strengthening the governance of climate action.<sup>69</sup>

62 [G20 Rome Leaders Declaration](#), 2021.

63 BU Global Policy Development Center. [Who Funds Overseas Gas Projects? Comparing Development Finance from China and Major Multilateral Development Banks](#), 2022.

64 IEEFA. [200 and counting: Global financial institutions are exiting coal](#), 2023.

65 Banking on Climate Chaos. [Fossil fuel finance report](#), 2023.

66 [Joint Statement by the Government of the Republic of Indonesia and IPG members on the Indonesia JETP](#), 2022.

67 [Political Declaration on establishing the Just Energy Transition Partnership with Viet Nam](#), 2022.

68 Also see IESR. [Enabling High Share of Renewable Energy in Indonesia’s Power System by 2030](#), 2022.

69 Climateworks Centre. [Energy transitions in Vietnam and Indonesia: Building blocks for successful Just Energy Transition Partnerships](#), 2023. Also see proposed framework to assess the potential for JETPs to deliver positive outcomes for the aforementioned dual challenges.

Financial institutions are deciding whether to provide new financial services and investments for unabated coal-fired power, and many are advocating for the phaseout of existing capacity. They are increasingly demanding credible transition plans from utilities and other power producers that describe how they will shift their generation mix away from coal and other fossil fuel assets.

### **Renewables are increasingly cost-competitive globally**

Analysis from BloombergNEF finds renewable power from wind and solar now represents the cheapest source of new power generation in markets representing 96% of global electricity generation. Solar and wind are also cheaper to build than running existing coal or gas plants in countries representing 60% of global electricity generation (see **Figure 6**).<sup>70</sup> For China, India, and Australia, renewable energy is already cheaper than fossil fuel, according to a study by Wood Mackenzie.<sup>71</sup> Meanwhile, a roadmap by the International Renewable Energy Agency (IRENA) shows that for most ASEAN countries, renewable energy will supply electricity at or below the cost of non-renewable energy by 2025.<sup>72</sup> Research has also shown that costs of renewable technology fall

as deployment increases due to learning benefits and economies of scale in project preparation, construction, operation and maintenance.<sup>73</sup> Intermittency issues with some renewables (solar, wind) are being addressed through the use of flexibility resources including robust grids and interconnections, demand response, energy storage, and dispatchable low-emissions generation, allowing renewables to take on a high share of overall power generation.<sup>74</sup>

A low-cost, clean power system can supply broad energy access to consumers and industry at lower cost and less volatile energy prices and fiscal impact. This supports manufacturing and other economic activity, while improving a country's economic competitiveness and comparative advantage in clean power and related technologies. Indeed, the scale of net-zero commitments globally will make low-emission production essential to sell into global supply chains. Unlike fossil fuel power sources that require ongoing procurement of fuels, renewable power sources and supporting grid and storage infrastructure have relatively low operation and maintenance (O&M) costs, with the bulk of cost in the upfront investment, presenting an opportunity to finance this investment.

70 BloombergNEF. [1H 2023 Levelized Cost of Electricity update](#), 2023.

71 Wood Mackenzie. [Renewable power in Asia Pacific gains competitiveness amidst cost inflation](#), 2022.

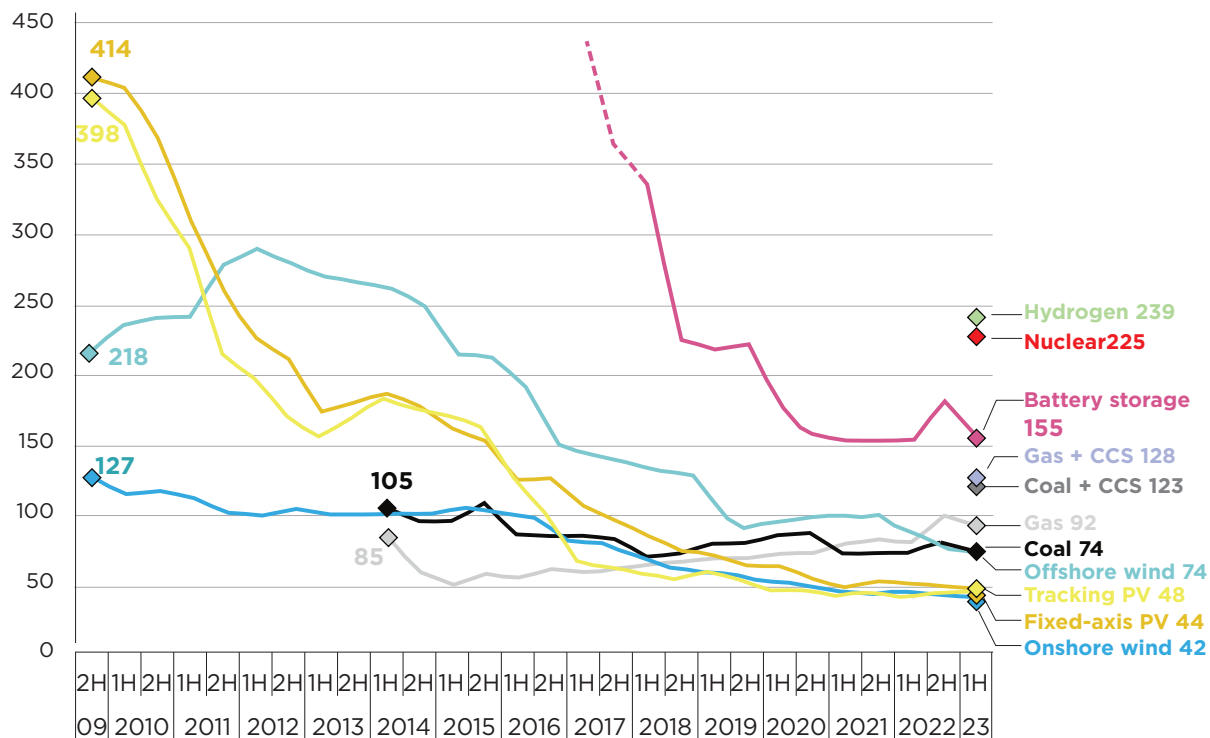
72 IRENA & ACE. [Renewable Energy Outlook for ASEAN](#), 2016.

73 University of Oxford. [Empirically grounded technology forecasts and the energy transition](#), 2021.

74 IEA. [Managing Seasonal and Interannual Variability of Renewables](#), 2023.

**Figure 6: Global levelized cost of electricity (LCOE) benchmarks by source****Global LCOE benchmarks, 2009-23**

\$/MWh (real 2022)



Source: BloombergNEF.

Note: The global benchmarks are country-weighted LCOE averages using the latest annual capacity additions and country LCOE benchmarks. Offshore wind includes the offshore transmission costs. Coal- and gas-fired power include a carbon price in regions where policies are already active. Gas is combined-cycle gas turbine. LCOEs do not include subsidies or tax-credits. LCOEs shown by financing date.

### Despite encouraging policy and technological developments, the economics of power sector transition remain challenging

Many APAC countries rely heavily for their energy supply on CFPPs, which are often relatively young, and plant owners have invested significant capital in them. As of January 2023, APAC's CFPPs have an average age of ~14 years, compared to 46 years (Europe) and 45 years (U.S.).<sup>75</sup> Across the largest six markets in APAC by coal power capacity, the median remaining life of CFPPs runs 10-15 years after the IEA NZE Scenario recommended coal phaseout years — by 2030 in OECD countries and by 2040 in non-OECD countries.<sup>76</sup>

The early retirement of CFPPs may imply write-downs and investment losses that increase the costs of switching. There are also upfront investment costs associated with transitioning to renewable power sources, such as grid connectivity and upgrades to manage intermittency issues. Policy and financial incentives will therefore be required to phase out coal and enable clean power deployment.

<sup>75</sup> Global Energy Monitor. [Global Coal Plant Tracker](#), 2023.

<sup>76</sup> Global Energy Monitor. [Global Coal Plant Tracker](#), 2023. Largest six markets by operating CFPP capacity are China, India, Japan, Indonesia, South Korea, Vietnam. Remaining life calculated against assumed unit lifetime of 40 years; units older than 40 years are assumed to operate an additional 5 years.

Furthermore, the flipside of a high capital-expenditure, low operating-expenditure power system is that the cost of capital can have a significant impact on the overall investment cost. For instance, the IEA notes that cost of capital can account for 20%-50% of the LCOE of utility-scale solar PV projects. Nominal financing costs can also be up to seven times higher in emerging and developing economies (EMDEs) compared with the United States and Europe. This is largely due to higher country-related risks and underdeveloped local financial systems, where energy transition project-related revenue streams denominated in local currency creates foreign exchange risk for international investors who bring foreign currency or for EMDE borrowers. Measures to address the cost of capital, such as effective risk management and policy support in the form of revenue stability or other guarantees, particularly in EMDEs, can make clean power and related infrastructure significantly more cost-competitive.<sup>77,78</sup>

**Much of the CFPP fleet in APAC is insulated from competitive pressures by fossil fuel subsidies and long-term contracts — this will need to be addressed in MPO transactions**

A large proportion (>90%) of APAC CFPPs operate in highly regulated markets and are insulated in some form from market forces: for example, they are state owned (see **Box 4**), have long-term power purchase agreements (PPAs), or benefit from energy subsidies.

Fossil fuel subsidies are widespread, often to support energy affordability, and remain a heavy fiscal budget burden for APAC governments. Among

many reasons, subsidies persist to ensure energy affordability and prevent price volatilities during price shocks.<sup>79</sup> However, such subsidies, including domestic market obligations<sup>80</sup> and preferential access to land, water and mining rights, can result in distortions of competitiveness against cleaner energy sources (which increasingly provide the cheapest source of power). Savings from subsidy removal can be used more effectively to support the poor, invest in clean energy, and stimulate the economy, creating a positive long-term effect. While social protection and clean energy should remain the priority for subsidy reallocation, in some circumstances it might be appropriate to use a share of savings as a source of financial support for MPOs, particularly in the context of supporting workers and communities with the impacts of transition. Fossil fuel subsidies in APAC amounted to \$327 billion in 2021, outweighing investments in renewable energy by around \$70 billion.<sup>81</sup> The benefits of reform include lower emissions, higher investments in cleaner, more efficient forms of energy, and competitive pricing. Ultimately, the costs and benefits of closing coal power and replacing it with cheaper renewable sources of power will typically accrue to taxpayers / consumers, particularly in power markets with significant state ownership or regulated pricing (**Figure 7**).

Long-term contracts with take-or-pay (capacity payment) clauses can make it very challenging to reduce reliance on existing coal power plants because their continued operation is contractually agreed. This can inhibit deployment of cheaper, clean alternatives. IEEFA has found that reliance on long-term PPAs to support coal power investments restricts regional governments' ability to shed high-emission coal assets without severe financial damage.<sup>82</sup>

77 IEA. [The cost of capital in clean energy transitions](#), 2021.

78 IEA. [Scaling up Private Finance for Clean Energy in Emerging and Developing Economies](#), 2023.

79 ADB. [What are the determinants of fuel subsidies in APEC Countries?](#), 2020.

80 Also see IESR. [Indonesia's Coal Dynamics: Toward A Just Energy Transition](#), 2019.

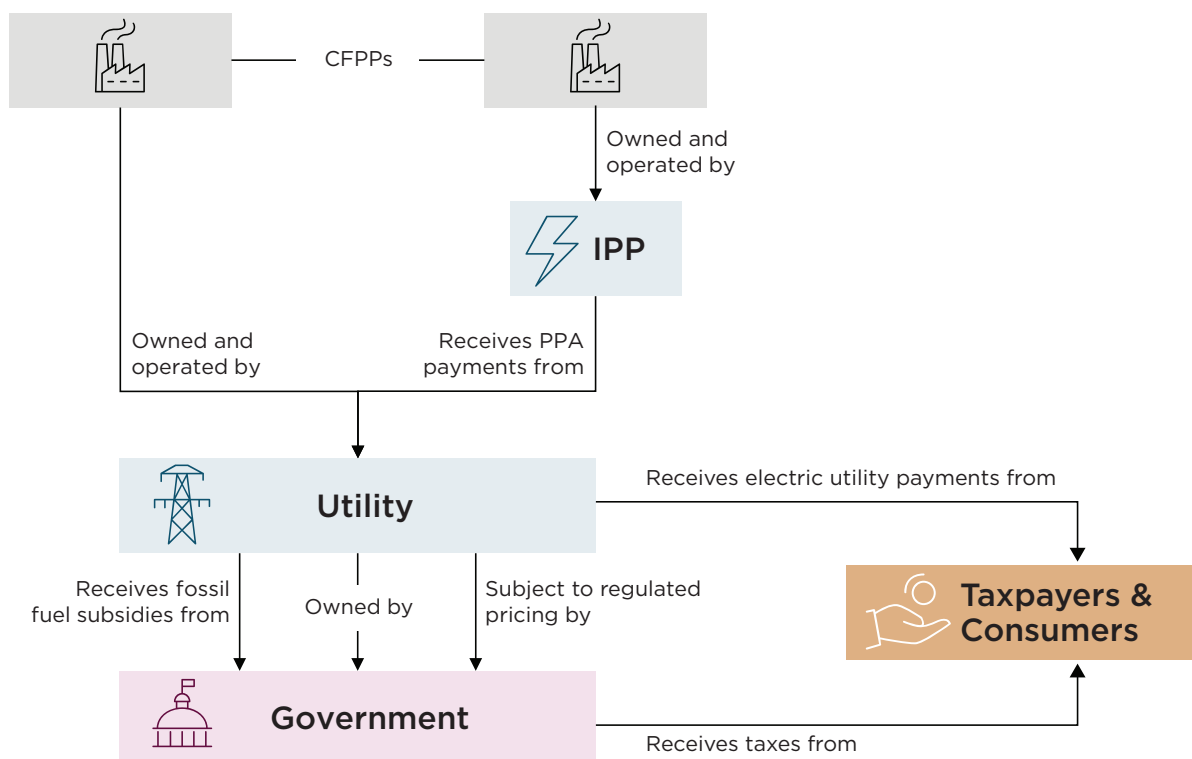
81 IEA. [Fossil Fuel Subsidies Database](#), 2022; BloombergNEF. [Energy Transition Investment](#). Renewable energy refers to wind (on- and offshore), solar (large- and small-scale), biofuels, biomass & waste, marine, geothermal and small hydro.

82 IEEFA. [Coal Lock-In in Southeast Asia: An Analysis of Existing and Planned Coal-Fired Capacity in Southeast Asia](#), 2021.

Additionally, many APAC countries do not set a technology dispatch order based on the short-run marginal cost of generation (i.e., short-run operating cost a generator incurs in providing an additional MWh of electricity to meet demand). In liberalized wholesale markets, such as Australia, a central dispatch process prioritizes lowest price / quantity bids. In this process, renewables can often secure a priority position due to their low or near-zero marginal cost, encouraging the scaling of renewables and phasing out of coal power.<sup>83</sup> However, in markets like Indonesia, the power dispatch merit order is established according to the traditional categorization of baseload, intermediate, peak; additionally, contractual constraints such as long-term fuel supply contracts are also factored in, and thermal plants may be dispatched ahead of lower-cost renewables.<sup>84</sup>

As such, MPO transactions may include buying out or renegotiating long-term or preferential contracts, or purchasing assets relating to the CFPP fleet, as well as putting in place retraining schemes and other support for workers. While these costs may be offset by lower power generation costs, a combination of public policy, particularly with respect to power market design, alongside supportive financing mechanisms will be needed so the cost savings from renewable rollout can be realized and finance the initial investment outlay and related costs of transition.<sup>85</sup>

**Figure 7: The costs and benefits of energy transition often ultimately accrue to taxpayers / consumers**



83 Csereklyei et al. [Coal generator revenues and the rise of renewable generation: Evidence from Australia's National Electricity Market](#), Energy Policy, Elsevier, 2023.

84 IEA. [Enhancing Indonesia's Power System: Pathways to meet the renewables targets in 2025 and beyond](#), 2022.

85 Also see IEA. [Increase in electricity license threshold for embedded electricity generation projects](#), 2023. In 2023, South Africa increased license threshold requirements for embedded electricity generation from 1 MW to 100 MW, effectively exempting embedded electricity generating companies and projects below this limit from licensing obligations with the National Energy Regulator – aimed at stimulating investments in new electricity generation.

#### Box 4: State-owned enterprises in the power sector

Globally, and particularly in Asian countries,<sup>86</sup> state-owned enterprises (SOEs) play a major role in the production of goods and services in many high-emitting sectors such as energy. Despite the wave of privatizations over recent decades, SOEs still account for 60% of coal plants and mines, as well as over half of global power generation capacities. As they represent a significant source of GHG emissions, SOEs are central for climate change mitigation efforts.<sup>87</sup> The Center on Global Energy Policy notes SOEs are responsible for at least 7.5 Gt CO<sub>2</sub>e of direct GHG emissions annually: Geographically, emissions are highly concentrated among entities controlled by the Chinese government (~70%), with governments in other APAC markets such as India, Indonesia, and South Korea also among the top six markets by emissions. The study also highlights the power sector as the dominant source of emissions (~85%).<sup>88</sup>

The prevalence of SOEs in the energy sector means their investment decisions are important for the future of the sector, where full decarbonization of the sector requires not only increasing zero-carbon electricity sources, but also a rapid phasing out of high-emitting generating plants (with unabated coal as a priority), as well as investment in supporting infrastructure for transmission and distribution and energy storage.<sup>89</sup> In fact, 60% of global generation capacities in renewables and nuclear power remain state-owned.<sup>90</sup>

An OECD working paper on the role of SOEs in the low-carbon transition notes several key characteristics of SOEs, including that they may be influenced by government mandates and have performance objectives beyond maximizing financial returns (e.g., social or environmental objectives). SOEs may also benefit from several advantages that are linked to their state ownership and close proximity to the government. An OECD study found there is an opportunity for governments with SOE holdings to make use of their shareholder influence to accelerate the low-carbon transition while retaining public service obligations (such as universal electricity provision) and financial return requirements.<sup>91</sup>

In markets with high levels of state ownership in the electricity sector, government influence over SOEs could be employed as a complementary policy lever to sector-wide or economy-wide energy and climate policies. Indeed, under the guidance of governments pursuing ambitious climate policy, SOEs can be effective vehicles for decarbonization.<sup>92</sup> In such cases, close coordination between general energy policy and SOE-specific objectives, as well as an inter-ministry, cross-cutting approach to climate action, will be needed to maximize efficiency and limit spillover effects for competing non-SOEs.<sup>93</sup> Another OECD working paper details considerations in promoting climate-related policies in the SOE sector, such as balancing commercial and non-commercial objectives, monitoring environmental footprints, and ensuring stakeholder engagement.<sup>94</sup>

86 ADB. [Green Finance for Asian State-Owned Enterprises](#), 2023.

87 OECD. [Climate change and low-carbon transition policies in state-owned enterprises](#), 2022.

88 Center on Global Energy Policy. [Greenhouse Gas Emissions from State-Owned Enterprises: A Preliminary Inventory](#), 2022.

89 OECD. [State-Owned Enterprises and the Low-Carbon Transition](#), 2018.

90 OECD. [Climate change and low-carbon transition policies in state-owned enterprises](#), 2022.

91 OECD. [State-Owned Enterprises and the Low-Carbon Transition](#), 2018. Empirical analysis considers 46 of 49 OECD member countries and the G20, excluding Argentina, Indonesia, and Saudi Arabia due to missing data on independent variables.

92 P. Benoit et al. [Decarbonization in state-owned power companies: Lessons from a comparative analysis](#), 2022.

93 OECD. [State-Owned Enterprises and the Low-Carbon Transition](#), 2018.

94 OECD. [Climate change and low-carbon transition policies in state-owned enterprises](#), 2022.

### Energy transition creates socio-economic challenges

The World Benchmarking Alliance's pilot assessment of the just transition contributions of 180 companies in high-emitting sectors found a systemic lack of action by companies to identify, prepare for, and mitigate the social impacts of their low-carbon strategies. While companies are taking some action relevant to the just transition, and are reporting on their basic human resource focused initiatives (such as job creation and training) and community support, the assessment found most are still lacking the insight to connect their environmental and social risks.<sup>95</sup>

APAC is home to four of the top eight coal-producing countries globally (China, Indonesia, India, Australia). China's coal mining sector employs about 3.2 million people as of 2018, and India and Indonesia generate about 416,000 and 240,000 direct jobs, respectively. While the employment level is modest, the industry produces a significant amount of indirect jobs across economic sectors and largely influences local labor markets.<sup>96,97,98</sup> It will be important to support the development of renewable energy, as evidence suggests replacing coal with renewables can create jobs and improve education, productivity,

and technology access for EMDEs.<sup>99</sup> This economic diversification and transition to a greener economy will nevertheless induce a shift in jobs, which should involve robust discussions on local and regional investments to stimulate the diversification and support the transition (such as putting in place retraining schemes and other support for workers). States also have an obligation to respect, protect, and fulfill the rights of environmental human rights defenders and the communities they represent.<sup>100</sup> Engaging with governments is important to address MPOs on two fronts: system-wide decarbonization and just transition support.

Due to the young age of plants today and the likely phaseout date of MPO plans, APAC may have a longer time horizon than other regions already undergoing the transition process (such as in South Africa) to plan and adjust to CFPP closures; as such, potential challenges such as electricity shortages, investor concerns, impacts on jobs and livelihoods, and political resistance will need to be planned and accounted for. South Africa's JETP is therefore a useful reference for APAC countries to develop their own transition strategies (see **Box 5**).

95 World Benchmarking Alliance. [Just Transition Assessment 2021](#), 2021.

96 World Bank. [Global Perspective on Coal Jobs and Managing Labor Transition out of Coal](#), 2021.

97 ADB. [Accelerating the Clean Energy Transition in Southeast Asia: Regional Scoping Report for Strategic Environmental and Social Assessment Applied to the Energy Transition Mechanism in Southeast Asia](#), 2022.

98 World Bank Group. [The World Bank's Approach to Just Transition For All: Methodology for Energy Transition in Coal Regions](#), 2021.

99 ILO. [A Just Energy Transition in Southeast Asia](#), 2022.

100 UN Office of the High Commissioner for Human Rights. [Environmental human rights defenders must be heard and protected](#), 2022.

### Box 5 : Learnings From South Africa's Just Energy Transition Partnership

South Africa's JETP highlights the importance of achieving consensus among government entities to support policies based on a deep understanding of the economic, social, and institutional barriers. Implementation revealed challenges due to shortcomings at the feasibility stage, vested interests, and growing political support for coal. Fostering agreement and alignment across government units, particularly among those that will implement the activities laid out in the investment plan, should be a key priority to help countries achieve a smoother, more effective transition.<sup>101</sup>

Early and frequent stakeholder engagement underpinned by transparency and accessibility through an appointed government body elevates the social impact of JETPs. In 2020, the South African government approved the formation of the Presidential Climate Commission (PCC), an independent statutory body to lead the government's transition work. Its effectiveness stems from its ability to work across all government departments and through its composition of the president as chair, select government ministers, and representatives from broader society.

World Resources Institute (WRI) observed that while the PCC conducted extensive stakeholder engagement and research to develop South Africa's just transition framework, stakeholder feedback indicated that communication was often too technical for the general public.<sup>102</sup>

#### There are limited public funds to support MPO, so mobilizing private finance is crucial

In EMDEs, more constrained fiscal positions, less developed capital markets, and a generally higher cost of financing means these markets are unable to bear transition costs alone. In addition, the IEA notes that debt burdens are on the rise and few governments in EMDEs have the fiscal space to mobilize resources for the energy transition.<sup>103</sup>

APAC countries typically have high levels of state ownership of power assets and related infrastructure. To attract investment required for climate-driven scenarios within existing market structures, the IEA highlights the role governments can play. Mobilizing private investment is dependent on the existence of appropriate regulatory frameworks, infrastructure planning, standardized and scalable contractual frameworks, appropriate market design, and fiscal incentives. The application of financial options for early retirement depends on such local energy and financial

frameworks, and would benefit from a clear and stable policy environment for the power sector as well as expectations for coal phaseout.<sup>104</sup>

Recent IMF analysis estimates the present value of financing needed to end coal globally and replace it with renewables at \$29 trillion (around \$20 per tonne of CO<sub>2</sub> avoided) — with nearly half of this in Asia — but with much larger social benefits (over \$104 trillion). As such, payments to support coal phaseout can represent good value with respect to the low cost per tonne of emissions avoided.<sup>105</sup>

Insufficient capital / financial mechanisms to support the early retirement of coal can lead to 'offloading' or 'brown-spinning' where, in order to meet net-zero targets, owners sell CFPPs to remove the related emissions from their balance sheets without achieving real-world emission reductions; and similarly, financial institutions reduce their exposure to CFPP owners / operators.

101 IISD. [What Can Indonesia Learn from South Africa's Experience of the Just Energy Transition Process?](#), 2023.

102 WRI. [5 Lessons from South Africa's Just Transition Journey](#), 2022.

103 IEA. [Financing clean energy transitions in emerging and developing economies](#), 2021.

104 IEA. [Financing clean energy transitions in emerging and developing economies](#), 2021.

105 IMF. [The Great Carbon Arbitrage](#), 2022.

**Long-term benefits of MPO far outweigh the costs**

Analysis of the Indonesian power sector by the Center for Global Sustainability found net-zero pathways show coal power generation would need to fall by 11% by 2030, 90% by 2040 and be almost completely phased out by 2045.<sup>106</sup> It found that in Indonesia, accelerated coal phaseout is feasible and beneficial from economic and social perspectives — the positive and broadly shared benefits from avoided coal-power subsidies and health impacts are two times to four times larger than the costs of stranded assets, decommissioning, employment transition, and state coal revenue losses. Nevertheless, the retirement costs are estimated to be \$4.6 billion through 2030 and \$27.5 billion through 2050. The accelerated coal phaseout for the Indonesian power sector would reduce cumulative emissions by 341 MtCO<sub>2</sub> through 2030 and 2,297 MtCO<sub>2</sub> through 2050, making the retirement costs equivalent to approximately \$12-\$13 per tonne of CO<sub>2</sub> removed.

The IEA NZE Scenario also highlights the need to end investment in new unabated CFPPs.<sup>107</sup> Analysis by the IESR in Indonesia, supported by the Rockefeller Foundation, found that preventing nine planned CFPPs would avoid nearly 300 Mt of emissions for less than 80 cents per tonne of CO<sub>2</sub>, with minimal repercussions for supply or grid stability and affordability.<sup>108</sup>

**Accelerating the early phaseout of high-emitting assets in APAC therefore requires a combination of supportive public policy and innovative financing structures**

Despite an increasing aversion to financing new CFPPs among many governments and investors, and the increasing awareness of the risk of such assets becoming stranded, there is great variation in the climate policies and pace of energy transition in APAC.<sup>109</sup> The current global energy crisis has highlighted the energy security benefits of renewable power, but governments may still be reluctant to completely close coal facilities for contingency reasons.

<sup>106</sup> UMD Center for Global Sustainability. [Financing Indonesia's coal phaseout: A just and accelerated retirement pathway to net-zero](#), 2022. Also see IESR. [Enabling High Share of Renewable Energy in Indonesia's Power System by 2030](#), 2022.

<sup>107</sup> IEA. [World Energy Outlook](#), 2021

<sup>108</sup> ESR and The Rockefeller Foundation. [New Study Finds Cancelling Coal Plants As Cost-Effective Way To Cut Global CO<sub>2</sub> Emissions](#), 2023

<sup>109</sup> [Climate Action Tracker](#)

## Managed phaseout (MPO) as a net zero-aligned strategy

[GFANZ guidance on net zero transition planning \(NZTP\)](#) sets out four key financing strategies to finance the transition to net zero:<sup>110</sup>

- 1) **Climate solutions:** Financing or enabling entities and activities that develop and scale climate solutions.
- 2) **Aligned:** Financing or enabling entities that are already aligned to a 1.5 degrees C pathway.
- 3) **Aligning:** Financing or enabling entities committed to transitioning in line with 1.5 degrees C-aligned pathways.
- 4) **Managed phaseout (MPO):** Financing or enabling the accelerated managed phaseout (e.g., via early retirement) of high-emitting physical assets.<sup>111</sup>

This report is focused on MPO strategies in relation to coal-fired power plants — “coal phaseout.” The report includes discussion of the guardrails as well as socio-economic considerations that financial institutions and other stakeholders might expect to see in a coal phaseout plan. Given the systemwide challenges inherent in powering modern economies, and the need to rapidly scale clean power and supporting grid and storage infrastructure, these aspects should be considered in tandem with coal phaseout strategies. Indeed, plans for coal phaseout can increase confidence in the deployment of renewable power.

Other strategic options for transitioning CFPPs, as part of one of the other three financing strategies noted above, such as investment in retrofitting and repurposing, may also play a role, but are not the focus of this report. For example, some approaches covered in the IEA’s *Coal in Net Zero Transitions* report included, in certain circumstances, retrofitting to allow for flexible operations of a CFPP (i.e., shifting to lower utilization peak / balancing role), energy efficiency or

carbon capture measures, or repurposing to co-fire with low-carbon fuels.<sup>112</sup> These might be considered as ‘Aligning’ strategies and could be undertaken alongside plans for MPO. More guidance for such alternative approaches, including definitions and metrics, may be required for consideration as part of credible transition financing (See **Box 6** for an example of criteria for assessing suitability of technologies for transition finance).

Financing based on a forward-looking coal phaseout strategy provides an alternative approach to simply withdrawing or withholding finance (e.g., divesting) from CFPPs and their owners, allowing financial institutions to promote an orderly transition by reducing the risk of sudden value destruction from stranding. Indeed, these CFPP owners / operators are likely to play an important role in transitioning their power sectors to net zero. The MPO approach mitigates financial marginalization for companies with high-emitting assets but with credible transition plans for their retirement, by ensuring a wider pool of prospective financiers. It enables net-zero committed financial institutions to maintain engagement with and investments in companies in high-emitting sectors. This supports influence over broader net-zero strategy and planning at these companies, maintains portfolio diversification, and recognizes that client or investee relationships and interests in companies are often broader than just a set of high-emitting assets.

Ultimately, the MPO approach seeks to achieve real economy emissions reductions (i.e., reductions by non-financial actors who operate power plants) through the financing of early CFPP retirement. Financial institutions can draw in broader stakeholders with similar interests, such as governments, MDBs, civil society actors, and local communities, to support an orderly and just transition and continuity of service considerations in APAC.<sup>113</sup>

<sup>110</sup> GFANZ. [Financial Institution Net Zero Transition Plans](#), 2022.

<sup>111</sup> See also GFANZ. [Managed Phaseout of High-emitting Assets](#), 2022.

<sup>112</sup> IEA. [Coal in net zero transitions](#), 2022.

<sup>113</sup> GFANZ. [The Managed Phaseout of High-Emitting Assets](#), 2022.

A strategic approach to MPO can help deliver:

- **Intent:** Directing capital to substantially reduce CFPPs' lifetime emissions.
- **Impact:** Achieving credible and timely emissions reductions in the real economy, helping realize countries' climate ambitions.
- **Innovation:** Channeling and scaling up

financing for these efforts through aggregation, standardization, new markets such as carbon credits, and new financing partnerships, such as philanthropy working alongside public and commercial sources of finance.

- **Inclusivity and energy security:** Helping to limit economic disruption related to the energy transition by maintaining grid stability and flexibility, and managing socio-economic risks and

#### **Box 6: Reference to ERIA - Technology List and Perspectives for Transition Finance in Asia, 1st Version (Sep 2022)<sup>114</sup>**

This document examines each candidate technology in a manner that will help financial institutions make an initial assessment of its suitability for transition finance with reference to six elements of a just and orderly transition to net-zero emissions.

##### **Technology characteristics**

- **Emissions impact:** This relates to the sustainability element of a just transition, measuring the extent to which the technology directly reduces emissions and so contributes to the decarbonization of a project, company, and country
- **Reliability:** This relates to the need to safeguard energy supplies, assessing the maturity of a technology
- **Cost:** The cost of the technology will influence the affordability of the transition (e.g., cost of abatement for upstream technologies, lifetime cost of energy)

##### **Additional considerations**

- **Lock-in prevention considerations:** Will the technology enable a transition to net-zero emissions within a Paris Agreement-aligned timeframe, or are other plans in place to avoid becoming locked in with non-compliant assets?
- **Do No Significant Harm considerations:** Will the technology negatively impact other environmental objectives? What preventative measures could be implemented?
- **Social considerations:** Will the technology negatively impact society?

<sup>114</sup> ERIA. [Technology List and Perspectives for Transition Finance in Asia](#), 2022. The document aims to provide a framework for assessing transition technology suitability, rather than a rigid classification. The focus of the first version of this report is primarily on the power sector and related upstream activities that together account for more than 50% of the region's CO<sub>2</sub> emission.

## Part 2: Financial institution expectations for MPO plans

GFANZ [Expectations for Real Economy Transition Plans](#) serves as a practical guide for real economy companies when building transition plans and disclosing progress against them. By outlining components of transition plans that financial institutions look for from real economy companies, the report helps real economy companies provide information most relevant to financial institutions. Engagement between financial institutions and coal plant owners / operators bilaterally or through existing initiatives (e.g., Climate Action 100+<sup>115</sup>, AIGCC's Asian Utilities Engagement Program<sup>116</sup>) can also be helpful in setting investor expectations, understanding phaseout financing needs, and developing decarbonization strategies.

A transition plan articulates a plant owner / operator's overall approach to the net-zero transition, including information regarding its climate objectives, targets, actions, progress, and accountability mechanisms, and helps define the company's overall role and level of ambition to accelerate the transition. A CFPP MPO plan (or coal phaseout plan) comprising these components may be specific to the asset, such as if the CFPP is project financed or subject to acquisition, or may form part of a plant owner / operator's overall company-wide transition plan. It is key for coal asset owners / operators to have clear commitments within their transition plans around the early retirement of plants on a science-based timeframe.<sup>117</sup>

Net-zero committed financial institutions may consider three key areas when assessing a coal phaseout plan in respect of providing finance to the entity or asset.

- **Credibility:** ensuring credibility of relevant energy transition and coal phaseout commitments and plans;
- **Impact:** optimizing 'meaningful' outcomes across climate impact, financial viability and socio-economic considerations; and
- **Accountability:** achieving transparency and accountability for coal phaseout plans in line with the [GFANZ NZTP framework](#).

The following three-step process (see **Figure 8**) outlines ten recommendations for financial institutions to provide an expectation of what should be covered in an entity-produced coal phaseout plan for CFPPs in APAC. This guidance draws on other key coal phaseout guidance and frameworks, and notes key reference material with additional information on specific thresholds or requirements to consider.<sup>118</sup> The three-step process may be integrated as part of existing processes today, and **Figure 9** uses the general project financing process as an example (see **Box 28**).

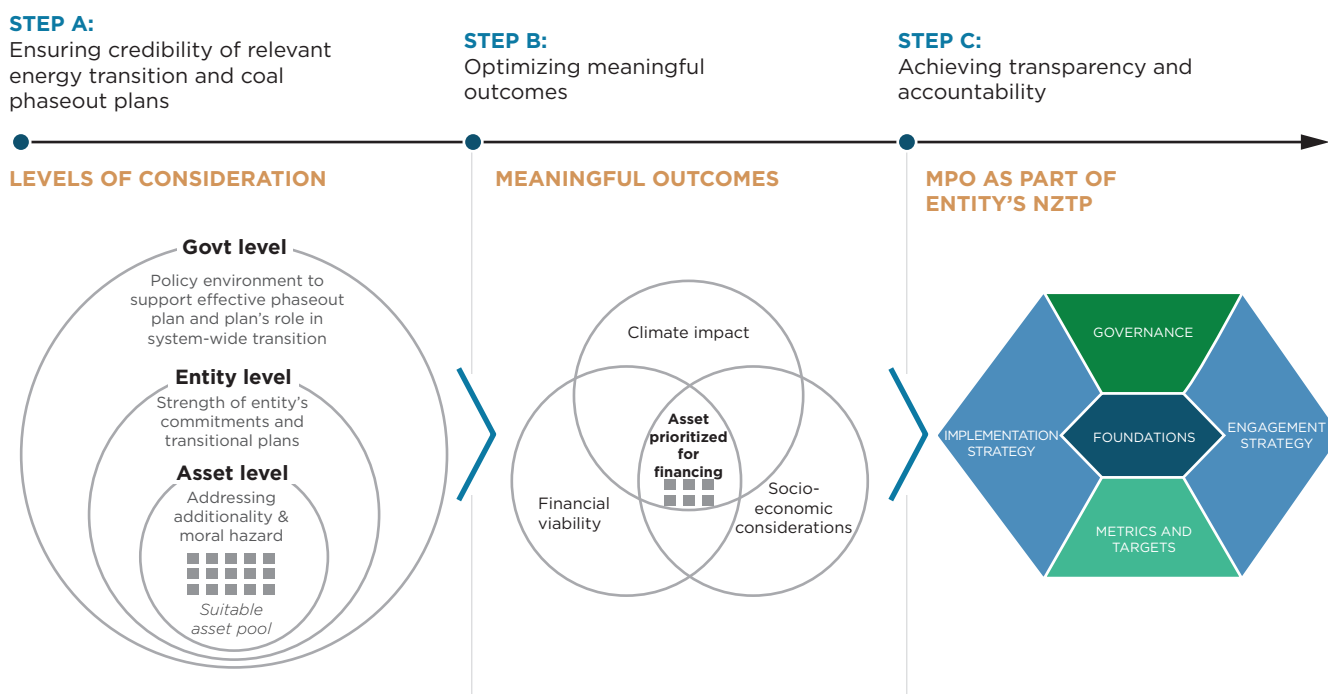
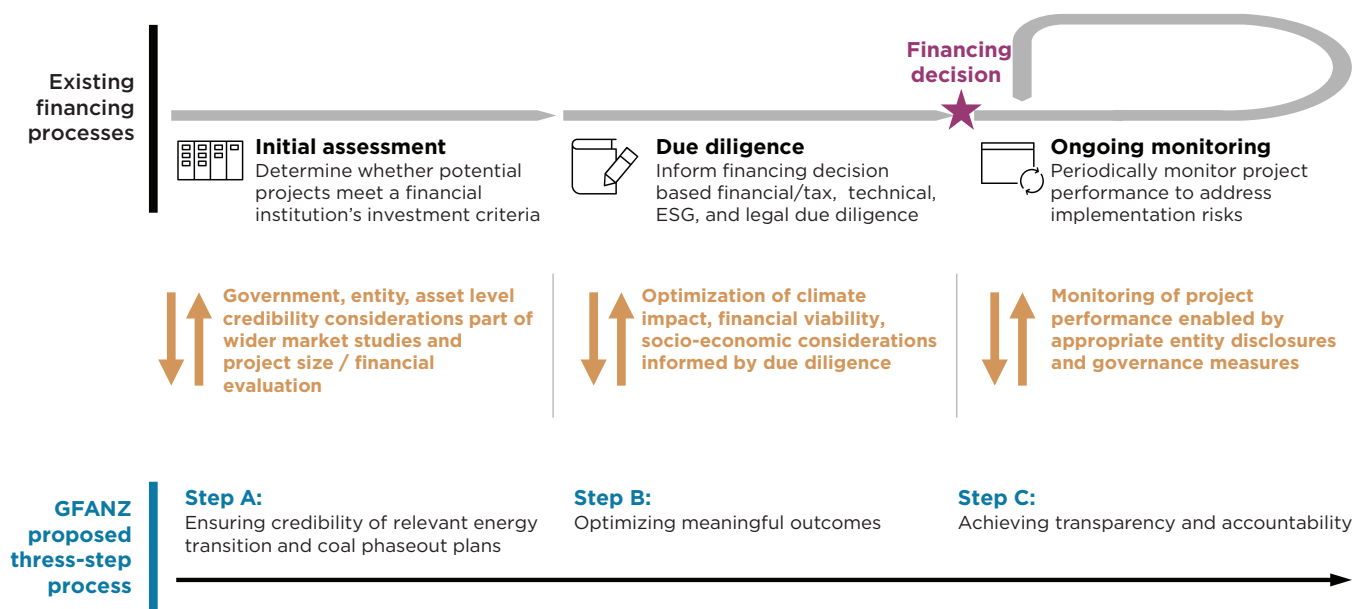
GFANZ also welcomes related work by policymakers and regulators on the role of transition planning to support an orderly and just transition. This includes building on and supporting convergence around consistent market-based approaches, such as those developed by GFANZ in this report and guidance. It will be important to ensure that where official sector requirements and frameworks are developed, they can capture plans for managed phaseout.

115 [Climate Action 100+ \(CA100+\)](#) is an investor-led initiative to ensure the world's largest corporate greenhouse gas emitters take necessary action on climate change.

116 [Asian Utilities Engagement Program](#) helps investors and service providers collaboratively engage with Asia's systematically important electric utilities to increase the effectiveness of climate engagement with a common agenda.

117 GFANZ and a wide range of stakeholders worked to determine the key components of transition plans for FIs and real economy actors (i.e., non-financial actors who operate power plants), such as utilities. This provides the basis for the expected coverage of an entity-level transition plan. See GFANZ. [Expectations for Real-Economy Transition Plans](#), 2022.

118 In particular, the work draws heavily on the Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022; that covers CFPP eligibility, coal transition pathways, social protections & accountability.

**Figure 8: Proposed three-step process for FI consideration of coal phaseout plans****Figure 9: Integrating the three-step process into existing financing processes**

## Step A: Ensuring credibility of energy transition and coal MPO plans

There are different levels at which planning / policy can give financial institutions confidence in the credibility and likely success of a coal phaseout plan.

In order to determine the credibility of a CFPP phaseout plan, there are three levels of considerations a financial institution can assess: the policy environment and plans for the power sector at government level, the entity's own plans to decarbonize, and plans specific to the asset to be phased out.

Typically, considerations start at the government level as that provides a basis for what financial institutions might then expect to see at the entity and asset level. Government-level considerations are also fundamental in addressing moral hazard and leakage risks.<sup>119</sup> At the same time, it is important to note that these levels of considerations are interdependent, such that more detailed or stronger plans at one level may give comfort if fewer requirements are present at other levels. For example, a clear set of entity assessments of, and engagement or lobbying activities towards, government commitments and policies to phase out coal may reduce a financial institution's requirements for as many commitments by an entity operating in that power sector. The higher the level of commitment across all three levels, in line with relevant science-based pathways, the greater the confidence financial institutions can have in the credibility of a CFPP phaseout plan.

Nevertheless, the network nature of power systems means that coal phaseout plans will require action by multiple actors in the power system (government, operators, and finance) to ensure the phaseout is effective, and power supply remains reliable, affordable, and secure. This cannot be completely internalized to the coal phaseout plan, nor the sole responsibility of a CFPP owner or its financiers.

## Government-level considerations

### Coal phaseout plans depend on the energy policy environment<sup>120</sup>

Ideally, a coal phaseout plan draws on clear and established government-level energy transition commitments and targets, implemented through national-level planning. These may include clear targets, commitments, and planning to halt new coal power and accelerate the phaseout of existing capacity.

The credibility of such targets depends on the degree of alignment with science-based pathways to net zero; for example, the IEA NZE Scenario involves retirement of unabated CFPPs by 2030 in OECD member countries and by 2040 in non-OECD member countries.

Disclosure of these climate-related policies and degree of science-based alignment provides visibility to assess if an entity's efforts are in line with achieving its goals. Financial institutions can use such entity disclosures to assess how the coal asset owner / operator considers the impact of public policy on enabling or hindering execution of its phaseout plan.

Broader societal or cross-party support (e.g., across government agencies, unions, civil society, academia) for climate and energy policies can improve confidence in their delivery, because the horizon of the energy transition is longer than typical electoral cycles. The entity's direct and indirect lobbying and public-sector engagement should advocate for policies that support or enable an accelerated and orderly transition to net zero, and do not contravene any net-zero commitments of the institution (see **Part 4** for more details).

Decarbonizing a country's power infrastructure is a systems issue that needs a system-level approach, with associated system-level analysis. The retirement of individual CFPPs in an uncoordinated manner could create risks to that system and its ability to supply accessible, affordable, reliable and secure power.

<sup>119</sup> Defined further in 'Entity-level considerations' section.

<sup>120</sup> UNESCAP. [Coal Phase Out and Energy Transition Pathways for Asia and the Pacific](#), 2021.

The parameters of a coal phaseout plan (e.g., the CFPP retirement date) are therefore ideally linked to a broader plan and sequencing for CFPP retirement, renewables deployment, grid infrastructure development, and other power system developments.

Where a transition mechanism or plan exists (e.g., JETP, ETM), it may be possible for such mechanisms to facilitate agreement on prioritization / sequencing of coal phaseout across a power system.

In some APAC countries, the government delivers a national energy transition plan and sets overarching targets. Sub-national governments, such as those committed to using all policy and regulatory levers under their authority to phase out unabated coal power under the PPCA Declaration, could lead on ambitious climate action and help pave the way for national governments to commit to a swift coal phaseout plan.<sup>121</sup> Ultimately, establishing such a plan is a government endeavor through the grid operator. Financial institutions can use publicly available analyses of government commitments and energy

plans to assess coal phaseout plans, which may reduce transaction and due diligence costs. For example, the World Bank Group's Country Climate and Development Reports are core diagnostic reports that start from each country's own development priorities and climate commitments, aiming to identify effective actions countries can take to make progress on climate and development goals.<sup>122</sup>

Where country-level policy is incomplete or weak, greater reliance on entity or asset-level considerations of an entity-produced coal phaseout plan may be required. Independent analysis of net-zero-aligned CFPP retirement dates for CFPPs in a power system may also provide a benchmark for considering the appropriate retirement sequence for CFPPs, particularly if a systemwide plan is absent.<sup>123</sup> As an example, the Asian Development Bank has developed a tool to identify and rank CFPPs for early retirement (see **Box 7**); other considerations such as socio-economic and environmental outcomes could also be adopted as criteria.

### Box 7: Reference to ADB Energy Transition Mechanism Pre-Feasibility Multi-Criteria Analysis<sup>124</sup>

The objective of ADB's multi-criteria analysis framework is to run a high-level screening of a country's coal fleet to identify and rank CFPPs for early retirement in the context of an ETM (or any retirement mechanism).

By providing confidence to governments / stakeholders with a strategic energy transition perspective, it aims to serve as an entry point for policymaker discussions and as a tool to size the scope of coal retirement policy and a government's participation in an ETM.

The analysis uses three scoring criteria (around the three general principles of energy policy), where a total combined score assesses how suitable a CFPP is for retirement.

- **Security:** Assessment of the impact of the CFPP's early retirement on grid's supply security
- **Cost:** Assessment of the economic viability of the CFPP's operations in terms of cashflow generation
- **Carbon:** Assessment of the emissions avoided by the CFPP's removal

The weighting of scores associated with these three criteria depends on a government's priorities, which will determine the final ranking of CFPPs.

121 PPCA. [COP26 must consign coal power to history](#), 2021.

122 The World Bank Group. [Country Climate and Development Reports \(CCDRs\)](#); also see [Bloomberg Global Coal Countdown](#), [Climate Watch](#), [Climate Transparency](#) and [Climate Action Tracker](#) for country-level climate policy assessments.

123 For example, such analysis was undertaken on the Indonesian power system: [Financing Indonesia's coal phaseout: A just and accelerated retirement pathway to net-zero](#), 2022.

124 ADB. [Regional: Opportunities to Accelerate Coal to Clean Power Transition in Selected Southeast Asian Developing Member Countries](#), 2021. Following this pre-feasibility study, ADB notes a full feasibility study focusing on these components is required: Technical feasibility; Political economy, legal and policy analysis; Asset identification and owner engagement; Fund structuring and capital raising.

To have the highest confidence that there will be no leakage within a jurisdiction, there needs to be both a governmental commitment to (1) 'no new coal' and (2) a coal phaseout date, both of which are ideally aligned with a science-based pathway such as the IEA NZE Scenario. However, the reality is that few jurisdictions within APAC have done this today.

While governments examine how they may raise their ambition over time, climate action needs to happen now. Net-zero committed financial institutions can drive action today, by outlining expectations at the government level and how they might inform the engagement strategy of a coal phaseout plan. Some key considerations that may help to provide confidence to financial institutions are (also see **Boxes 8 to 11**):

- Does the country have, or is it developing, a comprehensive transition plan for the energy or power sector, including coal, that

sets and seeks to deliver reduced peak overall / coal emissions, and an ambitious energy sector net-zero and coal phaseout date? In the absence of a national-level commitment, what is the equivalent sub-national / provincial government commitment?

- Does the plan benefit from external input (e.g., from UNFCCC, G7, IEA) to help validate the plan's credibility to meet developmental and energy needs of the country and align with science-based pathways to net zero?
- Is the plan underpinned by assessment at a national / system-wide level, including criteria and prioritization for CFPP closure?
- Is the country implementing a 'no new coal'<sup>125</sup> policy and actively taking steps to significantly slow or halt pipeline of new CFPPs, with plans to deploy low-carbon power resources?

<sup>125</sup> 'No new coal' may be interpreted as not initiating any new constructions beyond what has been approved by the government, and could further include canceling of pre-construction projects.

**Recommendation 1 (Government climate commitments):** Financial institutions should assess the nature, strength and stability of the energy sector transition commitment of the government of the country in which the CFPP is located. Specifically, this would include the degree of alignment with 1.5 degrees C science-based pathways (i.e., national-level ‘no new coal’ policies or specific coal phaseout date commitments).

- The stronger the level of national commitment and policies, and the greater the degree to which this aligns or converges with relevant science-based pathways, the greater the confidence financial institutions can have.
- The disclosure of a credible country-level transition plan can provide added confidence that a government intends to deliver on its commitments.

*This recommendation could be captured in the Engagement Strategy component of a NZTP.*

**Recommendation 2 (Government energy transition planning):** Financial institutions should assess the extent to which there is an existing or emerging plan (including but not limited to commitment through country platforms or alignment with science-based pathways) for the energy / power system that addresses how coal phaseout will be delivered alongside necessary investment in grid infrastructure and renewables, in the country in which the CFPP is located.

- Confidence can be increased through ambitious commitments to peak overall coal emissions by an identified date, to deliver net zero for the energy sector by a certain date, and transparency on how these goals can be met by bringing new coal to a timely end, and delivering the needed grid infrastructure and renewables projects.
- This could include but is not limited to commitment by the country to transition its power sector to cleaner energy like participation in the Just Energy Transition Partnership, or ‘no new coal’ and a transition plan that is in line with internationally accepted guidance, such as the IEA NZE Scenario.
- Where national-level planning is absent or nascent, financial institutions may be able to draw on independent analysis of the government policies in order to assess expected changes to power generation (including implications for coal power), but confidence may be lower.

*This recommendation could be captured in the Engagement Strategy component of a NZTP.*

### Box 8: Reference to Climate Bonds / CPI / RMI - Guidelines for Financing a Credible Coal Transition<sup>126</sup>

#### *Stage Gate 2, Emissions leakage*

Guideline: If the coal plant is not retired and replaced with a portfolio of clean resources that provides equivalent electricity services, long-term emissions savings are demonstrated through power-sector-level decarbonization commitments and plans.

While these commitments would not necessarily be expected to be fully aligned with 1.5°C to receive support from a Coal Transition Mechanism (CTM) today, such a commitment would support a ratcheting process to achieve 1.5°C ambition over time. This could include:

- In **wholesale electricity markets**, a legally binding commitment / law to reduce medium- and long-term power system emissions and a power-sector-wide commitment to no new unabated coal beyond plants that have reached financial close.
- In **regulated electricity markets**, a commitment to reduce medium- and long-term power system emissions, a long-term (10- to 20-year) integrated resource plan or equivalent power-sector-level plan, and a commitment to no new coal development or procurement beyond plants that have reached financial close.

### Box 9: Reference to UMD Center for Global Sustainability - Financing Indonesia's coal phaseout: A just and accelerated retirement pathway to net-zero<sup>127</sup>

This research uses a structured methodology to develop a feasible plan and associated financing needs for retiring Indonesia's coal-fired power plant fleet in support of national 2050 net-zero emissions and the global 1.5°C target, using a 3-step approach:

- First, develop the pathways for national 2050 net-zero emissions using a global integrated assessment model (the Global Change Analysis Model).
- Second, structure detailed plant-by-plant retirement pathways based on fulfilling multiple national priorities simultaneously and that also achieve the 2050 net-zero target. These pathways are generated by combining the top-down net-zero pathway and bottom-up plant-level assessments in light of national priorities (e.g., air quality, health, economic benefits). Individual coal plants are identified for retirement at specific times based on their technical, economic, and environmental performance.
- Third, estimate the magnitude of financing needs by systematically assessing the benefits and costs of implementing a just, rapid coal-to-clean energy transition.

<sup>126</sup> Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022.

<sup>127</sup> UMD Center for Global Sustainability. [Financing Indonesia's coal phaseout: A just and accelerated retirement pathway to net-zero](#), 2022. Also see IESR. [Enabling High Share of Renewable Energy in Indonesia's Power System by 2030](#), 2022.

**Box 10: Reference to ASEAN Taxonomy for Sustainable Finance, Version 2<sup>128</sup>**

*Plus Standard, Technical Screening Criteria for Coal power phaseout*

Tier 1 (Green): Aligned with a 1.5°C outcome and is consistent with the IEA Net Zero Emissions Pathway for the power sector to achieve net zero emissions by 2050. Specific conditions include:

- Coal phaseout by 2040; and
- Coal plants built after 31 December 2022 will not qualify; and
- Operation duration of the coal plant from commercial operation date is capped at 35 years; and
- Qualifying coal plants must demonstrate the adoption of best-in-class technology, provided that these technologies are affordable, accessible, reliable, and can be implemented within a reasonable timeframe; and
- Qualifying coal plants have been independently verified or acknowledged by internationally recognized bodies or programs as having demonstrated substantial absolute positive emissions savings over their expected lifetime compared to a case without a transition mechanism. Coal plants under the ADB ETM or JETP meet these criteria.

**Box 11: Reference to Singapore-Asia Taxonomy, Fourth Consultation paper<sup>129</sup>**

The CFPP can be considered as aligned with guidance and potentially suitable for a managed coal phaseout process, if it meets the following conditions:

**A. All of the facility level criteria – the taxonomy approach**

- I. The financial close or final investment decision of the coal plant has been made prior to December 2021.
- II. The fair value of the coal plant is positive at the time of the proposed coal transition.
- III. The early coal phaseout 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 recognized bodies or program.
- IV. The phaseout of unabated coal combustion at the coal plant is aligned with, or happens earlier than, 1.5°C-aligned coal phaseout 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 phaseout target that is earlier, national targets should be adhered to instead.
- V. Operation duration of the coal plant from commercial operation date is capped at 25 years complies with phaseout requirements in point IV.
- VI. Investments made as part of the early coal phaseout process do not extend the expected lifetime for coal combustion. Early coal phaseout has to lead to cessation of fossil fuel-based activities of a plant in line with the timeline specified in points IV and V.
- VII. Coal plant's generation is replaced 1-for-1 with a portfolio of clean resources that provides equivalent electricity services within the electricity system and:
  1. Clean resources are defined as resources with a life-cycle emissions intensity of 100 grams (g) CO<sub>2</sub> equivalent (CO<sub>2</sub>e) per kilowatt-hour (kWh) or less,
  2. Clean resources have to meet Taxonomy criteria for green category,

<sup>128</sup> ASEAN Taxonomy Board. [ASEAN Taxonomy for Sustainable Finance, Version 2](#), 2023.

<sup>129</sup> Green Finance Industry Taskforce (GFIT). [Fourth Taxonomy Consultation Paper](#), 2023.

3. Replacement is based on historical dispatch,
4. Replacement resources could include new resources dispatched elsewhere on the local grid (e.g., clean generation or demand-side energy efficiency or battery storage that reduces the system's generation needs at a level equivalent to the coal plant's electricity provision) or retrofits of the original plant to run on a different type of energy source (e.g., renewable power or, where it meets the 100gCO<sub>2</sub>e/kWh threshold, burning clean fuels),
5. It needs to be proved that replacement resources would be dispatched at a similar level as the retired generation (e.g., through an assessment of expected dispatch based on clearing prices in wholesale markets).

*If this requirement VII cannot be met and the coal plant is not retired and replaced with a portfolio of clean resources that provides equivalent electricity services, then entity and system level requirement B.III. has to be met. All other facility and entity and system level requirements have to be met.*

- VIII. The coal plant, at a facility level as a minimum, has a just transition plan to mitigate impacts on key stakeholders including workers, electricity customers, and the local community. The just transition plan is designed in line with global best practices devised by internationally recognized bodies, based on the principles outlined in the Paris Agreement and by the International Labour Organization's Guidelines 13 as well as local laws and regulations.

## **B. All of the entity and system level criteria – the transition planning approach**

### ***Entity level criteria:***

- I. The coal plant owner has an entity-level commitment to no new coal power plant development or procurement globally, beyond their plants that have reached financial close or final investment decision by December 2021 (as per facility level criteria A.I.).
- II. The entity has a 1.5°C-aligned transition plan that is aligned with the principles of transition finance outlined by International Platform on Sustainable Finance. 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 1.5°C 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.

### ***Power system level criteria:***

- III. If the coal plant is not retired and replaced with a portfolio of clean resources that provides equivalent electricity services (see facility-level requirement A.VII), long-term emissions savings are demonstrated through 1.5°C aligned, science-based power-sector-level decarbonization commitments and plans at a national or sub-national level – with a boundary entailing the entire power system in which the entity operates. While these commitments would not necessarily be expected to be fully aligned with 1.5°C to receive support from a CTM today, such a commitment would support a ratcheting process to achieve 1.5°C ambition over time and by 2030 the latest.

## Entity-level considerations

### Early retirement of a CFPP needs to be assessed in the context of the owner's broader plans

The risks of leakage and moral hazard may not be fully mitigated by national-level policies and plans for the power sector. It is also important to consider the entity's overall strategy in the context of the net-zero transition. In particular, the plan should address risks including:

- **Leakage:** that new fossil fuel infrastructure is developed or other coal facilities are operated more intensely in response to the closure of a CFPP;
- **Moral hazard:** that the features of a coal phaseout (particularly where public / concessionary funding is involved) may create perverse incentives to develop new CFPPs, or extend the life or runtime of existing CFPPs, in expectation that a coal phaseout plan for these assets could attract additional financing. It may also encourage stand-still or wait-and-see behavior.

The fungibility of finance provided to an entity (even for a specific use) means specific safeguards may be required to address the above risks. This is explored in more detail in **Part 3**.

Considerations may include (also see **Boxes 11 to 13**):

- Does the entity have a **'no new coal'** commitment (including life / capacity extensions) beyond those that have reached financial close?
- Has the entity set **science-based decarbonization targets**? If so, have the targets been verified by a credible third party?<sup>130</sup>
- Is the entity putting or has it put in place a **transition plan**<sup>131</sup> that references a science-based regional / country-specific pathway or plans?
- Does the entity explain **why a phaseout plan is appropriate** for the CFPP and how it fits within the entity's **climate-related transition** and broader company strategy?

In situations where financing relates to an acquisition of a CFPP, it may be appropriate to include conditions or covenants that seek to address the risks of leakage or moral hazard. An example might be prohibiting the seller from developing a new CFPP in the same power grid as the acquired CFPP.

In addition, entities operating captive power plants for use in industrial or commercial facilities may consider other sector-specific operational factors in exploring the shift to renewable energy (see **Box 14**).

**Recommendation 3 (Entity coal transition plan):** Financial institutions should assess the relevant entity's overall transition plan (both seller and buyer where applicable) — including but not limited to the specific CFPP — to gain confidence that a coal phaseout plan will be implemented and effectively mitigate emissions (e.g., an entity-level commitment to 'no new coal', or credible third-party-verified transition plan).

- Where a phaseout plan involves a change of ownership of the CFPP, it will be relevant to assess the plans of the seller as well as the buyer of the CFPP and related conditions on their coal power activities in a country or region.

*This recommendation could be captured in the Foundations component of a NZTP.*

<sup>130</sup> The [Science Based Targets initiative \(SBTi\)](#) and the [Transition Pathway Initiative Carbon Performance \(TPI-CP\)](#) are two initiatives that may be used to set and validate GHG emissions targets.

<sup>131</sup> The [Assessing Low Carbon Transition \(ACT\)](#), [Climate Action 100+ \(CA100+\)](#), and [Transition Pathway Initiative Management Quality \(TPI-MQ\)](#) are several initiatives that may be used as assessment tools to evaluate the credibility of transition plans and for investors to collaboratively engage companies. Complementary to the CA100+ Net Zero Benchmark, [Carbon Tracker has developed metrics](#) to track and monitor whether companies' announced retirements of coal and gas-fired generation capacity are in alignment with the pathways from a credible climate constraint scenario that meets the Paris goals.

### Box 12: Reference to Climate Bonds / CPI / RMI - Guidelines for Financing a Credible Coal Transition<sup>132</sup>

#### *Stage Gate 1, Financing coal plant owners*

Guideline: The coal plant owner has an entity-level commitment to 'no new coal' power plant development or procurement globally, beyond plants that have reached financial close or final investment decision. This includes a commitment to not extend the life or increase the capacity of any existing coal-fired power stations.

Although the recommendation of a 'no new coal' commitment is the minimum entity-level commitment that would support credible Coal Transition Mechanism financing today, entity-level commitments and transition planning are a strong area for future ratcheting of ambition.

Moving forward, the recommendation would be for coal plant owners to have in place commitments and develop transition plans as soon as possible and at the latest by 2030 that would minimally include:

- Short-, medium-, and long-term emissions commitments that cover entity-level emissions from generation and, when applicable, purchased power that are aligned with 1.5°C temperature targets with little to no overshoot
- Credible forward-looking transition planning focused on capital expenditure or integrated resource / electricity system planning, with transparent assumptions about costs and externalities
- A commitment to coal phaseout aligned with its entity-level emissions commitment and a forward-looking coal phaseout plan that supports achievement of that commitment
- Holistic transition planning that supports the achievement of climate targets

### Box 13: Reference to ASEAN Taxonomy for Sustainable Finance, Version 2<sup>133</sup>

#### *Foundation Framework, Climate Change Mitigation*

Guiding Principles for Climate Change Mitigation criteria:

- activity is in line with limiting global temperature rise to no more than 1.5oC in alignment with the Paris Agreement
- activity which is not already low- or zero-emissions may be required to demonstrate the capability of avoiding or reducing GHG emissions in line with relevant best practices compared to the baseline scenario without the mitigating action

Guiding Question 1A for Climate Change Mitigation (Environmental Objective 1): Does the activity avoid / reduce GHG emissions:

1. How does the activity avoid or help reduce emissions? (e.g., generation of electricity through renewables)
2. **Do the company's policies and business strategy generally avoid contradicting or impeding alignment with the specified environmental objective principles?**
3. Where applicable and relevant, is a third-party certification or verification of alignment of activity with EO1 available?
4. Does the activity fulfill relevant environmental law(s) applicable to EO1?
5. Are the effects of climate change mitigation efforts measurable and observable? (e.g., data on amount of carbon emissions avoided)

<sup>132</sup> Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022.

<sup>133</sup> ASEAN Taxonomy Board. [ASEAN Taxonomy for Sustainable Finance, Version 2](#), 2023.

### Box 14: Considerations for captive power

Globally, industry is the most energy-consuming and CO<sub>2</sub>-emitting end-use sector, accounting for 38% of total final energy consumption and 47% of CO<sub>2</sub> emissions.<sup>134</sup> In many EMDEs in Asia, there is a strong relationship between industrial development and the use of coal to fuel industrial processes and demand for electricity and heat. This link is evident in economies such as India, Indonesia and Vietnam, where coal has underpinned rapid economic growth and options for large-scale fuel switching have traditionally been relatively limited.<sup>135</sup>

Many industrial and commercial facilities utilize ‘captive’ generation (i.e., not connected to the electricity grid) to fulfil large and stable power supply requirements. ADB analysis in Indonesia finds that captive power has been a key driver of economic development in remote areas across the country as it enables energy-intensive industrial and manufacturing activities in places without coverage from the grid. In addition, captive power increases the competitiveness and attractiveness of industrial, residential, and mixed-use zones to investors as it provides energy security through reliable and stable energy supply.<sup>136</sup>

The majority of captive CFPPs in Indonesia support aluminum smelters and nickel and cobalt processing facilities that the government is promoting to turn Indonesia into a global hub for the electric vehicle and battery supply chains.<sup>137</sup> For industrial companies, policy signals — including energy performance standards and incentives to pursue energy savings and emissions reductions — play an important role in driving investments in climate-driven scenarios.<sup>138</sup>

ADB’s assessment of the captive power market landscape in Indonesia also covers the identification of clean energy alternatives to support the transition, along with potential obstacles that may arise in adopting them. In addition to the need for uninterrupted power to ensure no disruptions to manufacturing or industrial processes, considerations may include a comparison of LCOE across alternatives, intermittency and availability issues, integration with existing electricity sources, and other site-specific natural resources and conditions.<sup>139</sup>

In assessing coal power plant owners’ transition plans, it is useful to recognize the role captive power plants play and some of the additional challenges this may present to transition to clean power sources. Captive CFPP owners may also have flexibility in managing operations given the independence from national grid dynamics and prices.

134 IEA, [World Energy Outlook 2023](#), 2023.

135 IEA, [Financing Clean Energy Transitions in Emerging and Developing Economies](#), 2021.

136 ADB, [Captive Power Landscape Assessment for the Energy Transition in Indonesia](#), 2023.

137 ADB, [Captive Power Landscape Assessment for the Energy Transition in Indonesia](#), 2023.

138 IEA, [Financing Clean Energy Transitions in Emerging and Developing Economies](#), 2021.

139 ADB, [Captive Power Landscape Assessment for the Energy Transition in Indonesia](#), 2023. For instance, while lower cost than other alternatives, solar PV power plants (SPP) alone face intermittency and availability issues, and integration challenges with existing electricity sources. A combination of SPP and a battery energy storage system can be harnessed as a baseload power supply, but still fares more expensive than CFPP and PLN grid connection today.

## Asset-level considerations

### Restricting new CFPPs from coal phaseout plans may help mitigate perverse incentives to continue developing coal plants

As noted earlier, there is a risk of moral hazard if the financial benefits of putting in place coal phaseout plans create incentives to develop new CFPPs to benefit from such finance.

One option to mitigate this risk is to have a 'cut off' point before which CFPPs could be considered eligible to access financing for its coal phaseout plan.<sup>140</sup> This should mitigate any potential incentive to build new plants after such a time because they would not be considered eligible for coal phaseout financing.

For example:

- Climate Bonds / CPI / RMI guideline<sup>141</sup> and Singapore-Asia Taxonomy<sup>142</sup> recommend that the asset should have reached financial close before December 2021 (see **Box 15** and **Box 11**), with the former referencing the 2021 Glasgow Climate Pact. This threshold leaves ~85% of total capacity (operating and pipeline) eligible.
- ASEAN Taxonomy Version 2<sup>143</sup> recommends that the asset should have been built before 31 December 2022 (see **Box 10**), leaving ~75% of total capacity (operating and pipeline) eligible under this threshold.<sup>144</sup>

### Recommendation 4 (Addressing moral hazard):

**Financial institutions should assess conditions and commitments made in relation to a CFPP subject to an MPO plan (such as whether a plant was commissioned prior to thresholds put forth by taxonomies, or international or national commitments to phase out coal; i.e., 2021 Glasgow Climate Pact) to gain confidence that the risk of moral hazard is significantly contained.**

- Financial institutions should assess a broad range of factors with the aim of ensuring that any transaction addresses moral hazard. This assessment may include whether to exclude CFPPs that were commissioned (or financially closed) subsequent to thresholds put forth by taxonomies, international or national commitments on timelines to phasing down unabated coal power (e.g., 2021 Glasgow Climate Pact), or 'no new coal' commitments.

*This recommendation could be captured in the Implementation Strategy component of a NZTP.*

140 'Financial close' can be a useful basis for a threshold because it is the point at which significant investment is put into a CFPP project, presents a clear legal milestone, and can incentivize countries / utilities to abandon CFPP projects in early pipeline stages yet to have significant financial / contractual obligations.

141 Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022.

142 Green Finance Industry Taskforce (GFIT). [Fourth Taxonomy Consultation Paper](#), 2023.

143 ASEAN Taxonomy Board. [ASEAN Taxonomy for Sustainable Finance, Version 2](#), 2023.

144 Global Energy Monitor. [Global Coal Plant Tracker](#), 2023. Pipeline includes plants announced, pre-permit, permitted, and under construction.

### Box 15: Reference to Climate Bonds / CPI / RMI - Guidelines for Financing a Credible Coal Transition<sup>145</sup>

#### *Stage Gate 1, Moral hazard*

Guideline: The financial close or final investment decision of the coal plant is prior to December 2021, following agreement on the Glasgow Climate Pact

One way to mitigate moral hazard risk is to set a threshold for coal plant eligibility. These guidelines propose an eligibility threshold based on whether a coal plant reached financial close or final investment decision prior to the Glasgow Climate Pact. This threshold leaves nearly all coal capacity operating or under construction eligible today, though it would increasingly restrict the eligibility for future coal plants.

The Glasgow Climate Pact marked the first time that language on the need to phase down coal globally was included in an international climate deal – demonstrating strong international consensus that coal has no new role in a Paris Agreement-aligned future.

### A coal phaseout plan should accelerate the transition away from coal power

The entity may need to demonstrate that the coal phaseout plan for a CFPP is truly additive, in terms of how financing can **accelerate** its retirement timing relative to its design life, particularly in situations where concessionary capital is involved.

A positive fair value of an asset can indicate it is expected to continue to operate profitably. While there may be challenges in estimating fair value, it is already reported by many entities and could provide a useful benchmark to help assess the potential additionality of a coal phaseout plan (see **Box 16**). These disclosures may also include any key assumptions or uncertainties in the fair value assessment, and could involve third party verification to increase confidence in the estimate.

#### **Recommendation 5 (Accelerating phaseout):**

**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).**

- It is important to assess whether the provision of finance for a coal phaseout plan is genuinely needed to secure or accelerate the closure of the CFPP, or whether — left to market forces — the early closure might be expected to occur anyway (e.g., because the CFPP no longer has positive fair value).

*This recommendation could be captured in the Implementation Strategy component of a NZTP.*

<sup>145</sup> Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022.

### Box 16: Reference to Climate Bonds / CPI / RMI - Guidelines for Financing a Credible Coal Transition<sup>146</sup>

#### *Stage Gate 1, Additionality*

Guideline: The fair value of the coal plant is positive at the time of the proposed coal transition

Overview of several fair value methodologies (International Financial Reporting Standards):

- **Market approach:** Creates asset market value using market information from recent financial transactions of comparable assets applied to adjusted earnings
- **Income approach:** Creates a net present value (NPV) by converting revenue and cost assumptions for future cash flows, incorporating current market expectations
- **Cost approach:** Creates a remaining plant balance of the cost to acquire or construct the asset, or a comparable asset, adjusted / depreciated for obsolescence

The appropriate fair value methodology will depend on market and ownership structures, and the quality and availability of financial reporting data, but ultimately valuation approaches may be specific to transaction negotiations and assets.

### Step B: Optimizing ‘meaningful’ outcomes

Where possible, governments, CFPP owners / operators and financial institutions should prioritize the phaseout of CFPPs that create the largest climate impact, after taking into account financial viability and socio-economic impacts (such as maintaining access to secure, reliable, and affordable clean energy replacements, and mitigating just transition issues).

### Climate impact

#### **Coal phaseout should enable meaningful emissions reductions to support climate objectives**

With growing expectations from companies and financial institutions (across global supply chains) to support a transition to net zero, coal phaseout plans ought to demonstrate how they support that transition, e.g., emissions savings. Entities and their financiers can integrate this information into their broader transition plans to ensure the coal phaseout plan is contributing to net-zero objectives.<sup>147</sup>

At a minimum, coal phaseout plans should demonstrate a positive absolute emissions reduction over the expected lifetime of the asset relative to its expected operation without such a plan. Financial institutions and entities may target a particular level of emissions reduction. In setting any threshold around the emissions reduction, it will be important to consider the environmental, health, social, or power-sector co-benefits of a transaction that may be valued / prioritized by stakeholders such as local communities, regulators, and governments. The emissions savings need to be independently verified or acknowledged by internationally recognized bodies or programs (such as the JETPs and ADB ETMs) (see **Box 10**).

<sup>146</sup> Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022. Also see ‘Additionality’ guideline for benefits, challenges, and risks by valuation approach and key considerations for different electricity market and ownership structures.

<sup>147</sup> Many companies and financial institutions have independently committed to align their activities with a 1.5 degrees C pathway at a portfolio level; it is not the case that every asset and financial transaction needs to similarly be aligned with a 1.5 degrees C pathway.

Coal phaseout plans may usefully capture key milestones and actions, assumptions and uncertainties, and quantitative, measurable goals articulating the entity's climate ambition to measure a plan's progress and successful implementation, such as:

- 1) A 'backstop commitment' on the asset retirement date in reference to key benchmarks (see **Box 10**, **Box 11**, and **Box 19**), for example:
  - **IEA NZE Scenario** for CFPPs to retire by 2030 for OECD member countries and by 2040 for non-OECD members
  - **Country-specific targets** to phase out coal
  - **Taxonomies** such as the ASEAN Sustainable Finance Taxonomy, Singapore-Asia Taxonomy, etc.
- 2) A ceiling on the plant age from commercial operation date (or maximum years left to operate if beyond such a ceiling already):
  - a) ASEAN Sustainable Finance Taxonomy's 35 years plant age cap (see **Box 10**)
  - b) Singapore-Asia Taxonomy's 25 years plant age cap (see **Box 11**)

Plant age ceiling (years)	% of APAC CFPPs below ceiling <sup>148</sup>
≤ 35	~95%
≤ 30	~90%
≤ 25	~85%
≤ 20	~75%

- 3) A credible methodology to calculate emissions savings or a reduction in carbon intensity to quantify the decarbonization impact from a suitable baseline (e.g., assuming that the CFPP was run until 2040).
  - Standard-setters such as the GHG Protocol and Partnership for Carbon Accounting Financials (PCAF) have provided guidance on calculating emissions reductions, which can serve as a starting point for calculating emissions savings driven by CFPP early retirement.

4) Investment in emissions reduction technologies to achieve emissions reductions during the phaseout period. Such technologies should be affordable, accessible, reliable, and able to be implemented quickly.

- a) Such investment shall not prolong the life of an asset that would otherwise be decommissioned.
- b) As noted previously, this MPO guidance does not cover strategies such as retrofitting or repurposing CFPPs (which would be considered under the 'Aligning' financing strategy identified by GFANZ, and would require separate guidance, careful scrutiny of technical and economic feasibility, and guardrails).

Setting forward-looking metrics and targets for MPOs could help demonstrate impact and incentivize coal phaseouts. Examples provided by RMI<sup>149</sup> include:

- Cumulative CO<sub>2</sub>e emissions savings expected to materialize due to early retirement
- MWhs of annual coal power generation reduced driven by early retirement enabled by financing
- MWs of coal power capacity reduced driven by early retirement enabled by financing
- Years that retirement timeline has been accelerated

RMI<sup>150</sup> (see **Box 18**) and University of Maryland<sup>151</sup> (see **Box 9**) offer two examples of disclosing emissions savings:

- **A savings ratio as share of business-as-usual expected emissions** to highlight the extent to which financing will accelerate phaseout. A higher ratio would demonstrate larger expected relative emissions savings to assess impact and compare assets.
- **Contribution to net-zero national pathway**, combining a top-down net-zero pathway with bottom-up plant-level assessments, considering attributes such as:
  - **Technical:** age, size, combustion technology (ultra-supercritical, supercritical, subcritical), etc.

148 Global Energy Monitor. [Global Coal Plant Tracker](#), 2023. Analysis as of Jan 2023.

149 RMI. [Managed Coal Phaseout: Metrics and Targets for Financial Institutions](#), 2023.

150 RMI. [Managed Coal Phaseout: Metrics and Targets for Financial Institutions](#), 2023.

151 UMD Center for Global Sustainability. [Financing Indonesia's coal phaseout: A just and accelerated retirement pathway to net-zero](#), 2022.

- **Economic:** gross profit per capacity unit, etc.
- **Environmental:** CO2 emissions rate, local air quality, health impact, etc.

Disclosures of these forward-looking metrics can enhance comparability and indicate impact. As the pool of MPO transactions grows over time, the collective reporting of these metrics can guide subsequent MPOs, indicating an appropriate target range for ‘meaningful impact’ across these metrics.

Due to the absence of a standardized methodology to estimate these impact measures, we highlight key considerations when assessing climate impact of coal phaseout plans below:

- **Decarbonization contribution:** Impact may be measured by the emissions avoided as a result of early retirement. GFANZ’s [Scaling Transition Finance and Real-economy Decarbonization](#) seeks to capture the planned, real-economy emissions impact of assets and entities across key financing strategies as Expected Emission Reductions (see **Box 39**).<sup>152</sup> Selecting a proper baseline or BAU scenario is crucial for any emissions savings calculations, but requires granularity; **asset-level data**<sup>153</sup>, such as expected generation capacity, associated emissions footprint and factors, technical age, operational patterns, and **system-level analysis of factors**, such as the plant’s role within the electricity grid system, and relative cost competitiveness.<sup>154</sup>
  - For example, in Gold Standard’s proposed calculation methodology,<sup>155</sup> a CFPP’s operating efficiency is adjusted upwards (i.e., lower baseline emissions) to avoid falsely compensating owners of CFPPs with low efficiency and poor operations.

- Standard-setters in this field (e.g., GHG Protocol) could collaborate with the financial sector to create robust guidelines for calculating avoided emissions.

- **Retirement timelines:** Impact may also be inferred from the difference between the design life of the CFPP and its planned retirement point; that is, how far its retirement may have been brought forward. An alternative to the design life of the CFPP would be to consider its likely economic retirement point. This might require transparency in the assumptions used to estimate the economic retirement point, such as information on contractual arrangements in place (e.g., power purchase agreements) and judgments on the expected development of the power market.
- **Portfolio alignment measures:**<sup>156</sup> Metrics that support portfolio alignment measurement could be considered, such as emissions-based measures of how close to a suitable benchmark the cumulative emissions profile of the CFPP is, or its Implied Temperature Rise (ITR).
- **Systemwide decarbonization:** Emissions reductions at the power system level may depend on how power production is replaced: e.g., a coal phaseout may have greater impact where it supports rapid renewable deployment. It is therefore useful to consider the expected contribution of a CFPP retirement to power system decarbonization across the region, in addition to its individual emissions impact.

Independent verification of the proposed emissions reductions could provide confidence that impact is meaningful, and considers what is needed to decarbonize the power sector in which the CFPP is located. The University of Maryland<sup>157</sup> (see **Box 9**) provides an example of a CFPP retirement pathway for Indonesia.

152 GFANZ. [Scaling Transition Finance and Real-economy Decarbonization](#), 2023.

153 An example is Indonesia’s [APPLE-GATRIK](#) electricity emission calculation and reporting tool by the Ministry of Energy and Natural Resources.

154 See [PCAF Global GHG Accounting and Reporting Standard](#), which recommends either collecting emissions from the borrower or investee company directly (e.g., company sustainability report) or third-party data providers such as CDP, Bloomberg, MSCI, Sustainalytics, S&P/Trucost, and ISS ESG. Estimation models are recommended to use emission factors from verified calculation methodologies such as from Ecoinvent, Defra, IPCC, GEMIS.

155 Gold Standard. [Methodology concept for the early Phaseout of coal fired thermal power plants and their replacement with green-field renewable energy generation plants](#), 2023.

156 GFANZ. [Measuring Portfolio Alignment](#), 2022.

157 UMD Center for Global Sustainability. [Financing Indonesia’s coal phaseout: A just and accelerated retirement pathway to net-zero](#), 2022.

**Recommendation 6 (Climate impact): Financial institutions should prioritize MPO plans that support alignment with a science-based pathway, with proposed emissions reductions as ambitious as possible, with public-sector endorsement or independent verification, and in line with timeframes set out by internationally recognized bodies.**

- This could involve: (i) targeting a phaseout year for coal in line with the IEA NZE Scenario, credible country-specific targets (e.g., JETPs), or taxonomies (e.g., ASEAN Sustainable Finance Taxonomy, Singapore-Asia Taxonomy); (ii) implementing a cap on duration of plant operation; and (iii) demonstrating a credibly

verified methodology to calculate the amount of emissions savings achieved by the MPO.

- Consideration should include the expected contribution to overall power system decarbonization across the region.
- Relevant policymakers and standard setters should set the metrics, thresholds, pathways, or other benchmarks they consider most appropriate, with the aim of incentivizing finance for credible MPO plans.

*This recommendation could be captured in the Implementation Strategy and Metrics and Targets components of a NZTP.*

### **Box 17: Reference to Climate Bonds / CPI / RMI - Guidelines for Financing a Credible Coal Transition<sup>158</sup>**

#### *Stage Gate 2, Climate-alignment*

Guideline: The CTM results in emissions savings compared with a case without the use of the CTM and has a backstopping commitment to phase out unabated coal combustion at the coal plant by country-specific, 1.5°C-aligned coal phaseout deadlines.

Coal plant owners and financial institutions may also wish to provide a quantitative estimate of emissions savings to lend greater transparency to the transaction. In these cases, we suggest that emissions savings be estimated at a power system level to reduce emissions leakage. However, quantitative emissions savings methodologies and whether specific emissions savings thresholds would be appropriate to lend further credibility to transactions are important areas for future work.

The proposal is for these backstopping commitment deadlines to be the earlier of a country's coal phaseout commitment date or a country-specific, 1.5°C-aligned coal phaseout date. In advanced economies, this could mean the coal plant retires at the latest by 2030, and in other countries by 2040, in line with the IEA NZE Scenario.

<sup>158</sup> Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022.

### Box 18: Reference to RMI Working Paper on Managed Coal Phaseout: Metrics and Targets for Financial Institutions 2023<sup>159</sup>

#### *Phaseout impact assessment*

With fit-for-purpose metrics, financial institutions can demonstrate whether their coal power financing leads to real-economy decarbonization, and clearer guardrails and standards around measurement approaches can help ensure comparability, accountability, and transparency across the financial sector.

Problem statement: To recognize the decarbonization impact from coal phaseout even when emissions reductions are realized in the future, forward-looking metrics and targets can be used to assess the positive climate impacts of early retirement and incentivize financial institutions to finance such assets and transactions

Concept: Estimate positive climate impacts driven by early retirement based on, for example:

- **Cumulative CO2e emissions savings** that are expected to materialize due to early retirement. One way to compare the relative impact and additionality would be to calculate the CO2e emissions savings ratio (calculated as cumulative emissions savings as a share of BAU expected emissions).
- **Generation reduction:** MWhs of annual coal power generation reduced driven by early retirement enabled by financing from an FI
- **Capacity reduction:** MWs of coal power capacity reduced driven by early retirement enabled by financing from an FI
- **Years that retirement timeline** has been accelerated

159 RMI. [Managed Coal Phaseout: Metrics and Targets for Financial Institutions](#), 2023.

**Box 19: Reference to IEA World Energy Outlook***2023 Edition: Scaling up clean power hastens decline of coal<sup>160</sup>*

Coal is the largest source of electricity in the world today, accounting for 36% of the total, but is projected to be overtaken by renewables by 2025 in all three scenarios -- Stated Policies Scenario (STEPS), Announced Pledges Scenario (APS), Net Zero Emissions by 2050 (NZE) Scenario. By 2030, with new construction slowing and efforts to transition away from coal underway in many countries, the share of unabated coal in electricity generation falls below 25% in the STEPS, 20% in the APS and 15% in the NZE Scenario. In STEPS, unabated coal-fired power peaks in China around 2025 and shortly after 2030 in India. Beyond 2030, the use of unabated coal in power continues to diminish as the largest users – China, India, Indonesia and other emerging market and developing economies – increasingly look to alternatives.

The largest single contribution to closing the ambition and the implementation gaps in both the APS and NZE Scenario comes from replacing coal-fired power generation with renewable energy sources. In EMDEs, the switch to clean sources of electricity makes up 40% of total emissions reductions between today and 2030 in both scenarios.

*2022 Edition: Investment in coal falls in all scenarios this decade<sup>161</sup>*

Investment in coal supply and coal-fired power generation worldwide has fallen by more than 20% since 2015. Most investment in recent years has been in China and India, together accounting for about 70% of global investment in CFPPs and supply in 2021. In the STEPS, bans by some countries on financing new CFPPs and supply projects abroad together with coal phaseout policies cause average annual investment to 2030 to fall by 30% from recent levels with continued declines thereafter. In the APS, there is a larger drop in spending, especially in advanced economies. By 2030, there is virtually no coal investment in the European Union, and advanced economies in Asia significantly reduce investments in coal. In the NZE Scenario, there is no need for new coal mines or mine lifetime extensions, and no new coal-fired power plants are approved.

*2021 Edition: Closing the gap from the APS to the NZE<sup>162</sup>*

While the priority is to phase out the oldest and least efficient plants, more than \$1 trillion of capital has yet to be recovered in younger plants in the existing coal fleet (mostly in Asia). A rapid phaseout risks creating stranded assets. Existing coal-fired power plants in emerging markets and developing economies are relatively young: for example, plants in Asia are on average 13 years old. In the APS, coal-fired plants in these countries are retired on average when they are 35 years old, and in the NZE, they are retired when they are around 25 years old. In advanced economies, the average age of the coal power plant fleet is almost 35 years, and plants are retired on average in eight years in the APS and in five years in the NZE.

160 IEA. [World Energy Outlook](#), 2023.

161 IEA. [World Energy Outlook](#), 2022.

162 IEA. [World Energy Outlook](#), 2021.

## Socio-economic considerations

### Maintaining energy security and reliability is a key consideration in decommissioning CFPPs

When considering the decommissioning of a power plant and its timing, it is important to consider the impact on access to affordable and reliable power (see **Box 11**, **Box 20**, and **Box 21**). This relates to **Recommendation 2** earlier. More comfort can be taken on the overall impact of the coal phaseout where there are plans by the government, entity or other operators to bring on clean power sources and related infrastructure that can address any power generation (not just capacity) shortfall from the decommissioning of the CFPP. For instance, the entity may disclose relevant engagement or collaboration with value chain members and peers to ensure energy security and reliability. (Also see **Box 22** for an example of Bangko Sentral ng Pilipinas expectations on banks' consideration of sustainable goals and growth of the economy).

Direct CFPP replacement with clean power<sup>163,164</sup> may not always be practical from an investment, planning, location, or system reliability perspective. Depending on the country's regulations, the government or grid utility may also produce pre-feasibility studies on renewable power to identify a preliminary replacement power source that does not compromise energy security, and grid impact / assessment studies to evaluate the required changes in a country's power system to accommodate CFPP retirement. Such studies may include energy systems modeling to explore different scenarios, including climate policies, technology costs and pathways, and expected development and dispatch of CFPPs, with and without early closures.<sup>165</sup>

Other activity to give confidence that energy security will be maintained could include:

- New clean power resources dispatched elsewhere on the local grid
- Retrofits to fossil fuel plants on the local grid to use clean fuels run on a different type of renewable energy source

**Recommendation 7 (Accessible, affordable clean energy):** Financial institutions should assess what measures are in place to support access to secure, reliable and affordable clean energy replacements, such as having feasibility and cost assessments of clean energy replacements, with actions underway to deliver them.

- Assess measures in place to ensure the coal phaseout plan is part of a broader strategy to support energy security, reliability, and affordability, now and in the future.
- Measures could include feasibility and cost assessments of clean energy replacements, drawing on available local energy transition planning and independent assessments, taking into account both near- and long-term steps that could build out low-carbon energy systems.

*This recommendation could be captured in the Engagement Strategy component of a NZTP.*

163 The EU Taxonomy, ASEAN Taxonomy Green tier, and Singapore-Asia Taxonomy Green tier define clean energy as having lifecycle emissions intensity threshold of <100gCO<sub>2</sub>e/kWh for electricity generation activities, which is increasingly accepted as a threshold within the international financial sector and in other government criteria for sustainable projects, and is technology and fuel agnostic, but would effectively prevent direct financing CFPP replacement with other fossil-fuel power plants without significant CCUS investment.

164 With the [Complementary Delegated Act \(CDA\)](#) in 2022, the EU Taxonomy included criteria for certain fossil gas and nuclear energy activities. [Climate Bonds](#) and [Allianz Global Investors](#) find that very few existing natural gas plants meet the stringent technical criteria, needing both substantial value chain leak detection and reduction and carbon capture technology. Under the [IEA NZE Scenario](#), unabated natural gas will fall from 23% to 3% by 2050; similarly, natural gas with CCUS is expected not to constitute a significant proportion of the future energy market to 3% in 2050.

165 Also see TransitionZero's [Future Energy Outlook \(FEO\)](#) open-source energy system modeling tool and data platform, designed to support users in exploring different scenarios in projecting how power production and generating capacity will grow in the future.

**Box 20: Reference to ASEAN Taxonomy for Sustainable Finance, Version 2<sup>166</sup>**

*Plus Standard, Technical Screening Criteria for Electricity Generation from fossil gas (excl. unabated coal), renewable non-fossil gaseous and liquid fuels, bioenergy*

**Tier 1 (Green):** Activity is in line with limiting global temperature rise to no more than 1.5°C, according to the Paris Agreement

- Lifecycle GHG emissions from the generation of electricity by the entire facility <100 gCO<sub>2</sub>e/kWh

**Tier 2 (Amber T2):** Activity supports a transition towards a Green pathway within a defined time frame, and results in a contribution to climate change mitigation which is at least as good as the lowest carbon emitting technology currently technically and economically feasible for widespread use in ASEAN, with a prescribed sunset date

- Lifecycle GHG emissions from the generation of electricity by the entire facility: >100 and <425 gCO<sub>2</sub>e/kWh, reflecting projected emissions intensity for SE Asia in 2030

**Tier 3 (Amber T3):** Activity is in line with supporting the meeting of Nationally Determined Contribution (NDC) reduction targets of ASEAN Member States (AMS) that do not have a net zero 2050 timeline, or meets the TSC of Amber (Tier 2) or Green, but has been assessed that it will do some level of significant harm to other environmental objectives

- Lifecycle GHG emissions from the generation of electricity by the entire facility: >425 and <510 gCO<sub>2</sub>e/kWh, reflecting projected emissions intensity for SE Asia in 2027

**Box 21: Reference to Climate Bonds / CPI / RMI - Guidelines for Financing a Credible Coal Transition<sup>167</sup>**

*Stage Gate 2, Emissions leakage*

One way to mitigate emissions leakage risk is to pursue a phaseout and replacement strategy, where the coal plant's generation is replaced with a portfolio of clean resources that provides equivalent electricity services within the electricity system.

In these guidelines, "clean resources" are defined as resources with a life-cycle emissions intensity of 100 grams (g) CO<sub>2</sub> equivalent (CO<sub>2</sub>e) per kilowatt-hour (kWh) or less, in line with the EU Taxonomy for Sustainable Activities.

Although direct retirement and replacement of a coal plant with clean resources is one way to mitigate leakage risk, it may not be practical from an investment or power system reliability perspective. We also recommend the resource plan include a credible analysis of alternative options that demonstrates there is no economically and technically feasible clean energy alternative that meets energy security and access objectives.

166 ASEAN Taxonomy Board. [ASEAN Taxonomy for Sustainable Finance, Version 2](#), 2023.

167 Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022.

## Box 22: Example of Bangko Sentral ng Pilipinas (BSP) - Environmental and Social Risk Management (ESRM) Framework<sup>168</sup>

### *Minimum supervisory expectations on ESRM system: Expectation 1*

One of the major expectations under the BSP Sustainable Finance Framework is the development and implementation of the Environmental and Social Risk Management (ESRM) System.

Expectation 1: The Board of Directors and Senior Management shall institutionalize and oversee the adoption and implementation of sustainability principles, including those covering environmental and social (E&S) risk areas, in the corporate governance and risk management frameworks as well as in the strategic objectives and operations of the bank.

The BSP expects the board to set strategic E&S objectives covering short, medium and long-term time horizons as well as approve the risk appetite that the bank is willing and capable to manage through which the E&S risks may materialize. The board is also expected to set out clear criteria involving decisions to finance or invest in high E&S risk sectors during the said term horizons.

The criteria shall consider the long-term financial interest of the bank and its role in contributing to the sustainable goals and growth of the economy. With these set criteria, banks are expected to review the composition of their loan and investment portfolios and start aligning their exposures with the overall E&S objectives.

## **The success of coal phaseout plans will depend on how socio-economic (just transition) issues are addressed**

The transition from coal to clean energy can involve social, environmental, and economic risks, as well as opportunities. A just transition involves maximizing the social and economic opportunities of climate action while minimizing and carefully managing any challenges through effective social dialogue and stakeholder engagement.<sup>169</sup>

The success of a coal phaseout plan will depend on participants' ability to garner support from broader stakeholders who are socially or economically impacted by both the operation and closure of the CFPP. Affected stakeholders may include plant workers, suppliers dependent on CFPP revenue,

adjacent communities and micro, small, and medium enterprises within them, electricity consumers, and the most vulnerable groups to physical and transition risks (children, women, indigenous and traditional communities, and the elderly and disabled).<sup>170</sup> Aspects such as societal support for a coal phaseout plan or ensuring the transition to a clean power system has a suitably trained workforce can be critical to the overall success of the energy transition and address existing inequalities (e.g. job creation, decent work, increased workforce participation by women and underrepresented communities). CFPP closure will also reduce air pollution and ease water scarcity and / or fisheries impact, improving the health of the community and ecosystem and highlighting the overall social and environmental benefits of MPOs.<sup>171</sup>

168 Bangko Sentral ng Pilipinas (BSP). [The Philippine Sustainable Finance Roadmap](#), 2022. Bangko Sentral ng Pilipinas (BSP). [Guidance on the Implementation of the Environmental and Social Risk Management \(ESRM\) System](#), 2022.

169 ILO. [Climate change and financing a just transition](#); UNGP. [Guiding Principles on Business and Human Rights](#), 2011; Shift. [Climate Action & Human Rights](#), 2023; IFC. [Environmental and Social Performance Standards](#), 2012; Council for Inclusive Capitalism. [Just Transition: Framework for Company Action](#), 2021.

170 Shift Project. [Climate Action and Human Rights](#), 2023.

171 ADB. [Regional: Accelerating the Clean Energy Transition in Southeast Asia](#), 2022.

Just transition elements will require strong cooperation and joint planning with the government. Beyond direct impacts, financial institutions may often not be deemed directly financially responsible for just transition aspects, but would minimally need to participate in a process to identify indirect and induced impacts, and ensure that these impacts are being managed. For example, insurance companies can play a role by providing products that provide social protection to workers while they transition from coal to renewable industry. These impacts might seem minor for individual transactions, but as multiple transactions occur, the indirect and induced impacts will start to compound and have deeper socio-economic impact. This will be the responsibility of governments to manage, supported by institutions such as MDBs.

Just transition principles extend to societal and financial resilience. This can include provision of adequate coverage to manage any contingent liability to the government in the case of catastrophic events, ensuring some kind of generation capacity could be returned after a loss event. This is where insurance capital could support resilience of the community and nation.

For entities, inclusion of just transition elements within their overall strategy should complement the overarching climate ambition. Just transition elements can be captured within relevant components of the [GFANZ NZTP Framework](#). The LSE Grantham Research Institute describes adherence to rights-based frameworks<sup>172</sup> and sets out just transition considerations that are aligned with the GFANZ framework (see **Box 24**).<sup>173</sup> The International Labour

Organization Just Transition Finance Tool also provides financial institutions with practical advice on embedding just transition throughout their operations (see **Box 25**).<sup>174</sup> Furthermore, the Impact Investing Institute's Just Transition Criteria provide criteria to align products and solutions (including investments) to support a just transition.<sup>175</sup>

These elements may be relevant to include in a coal phaseout plan:

- **Environmental and social risk impact assessment:** The entity and / or government could carry out an environmental and social risk impact assessment, including quantitative assessments where possible, to determine both negative and positive impacts of coal MPOs (e.g., distributional impacts analysis across affected groups on local economy and livelihoods, employment and labor conditions, gendered impacts, health and safety, land use, and waste management).<sup>176</sup>
- **Social dialogue and stakeholder engagement plan:** Social dialogue with unions, employers, and the government, and stakeholder engagement with communities, international organizations, academia, and civil society (including youth), can cultivate public support, integrate local perspectives, promote innovative ideas from diverse stakeholders, and facilitate the creation of sustainable, culturally appropriate, and feasible coal phaseout plans. Many existing resources provide guidance on developing these plans.<sup>177</sup>

172 Some examples include UNGP's [Guiding Principles on Business and Human Rights](#), ILO [labour standards](#), [OECD Guidelines for Multinational Enterprises on Responsible Business Conduct](#), and [Sustainable Development Goals](#).

173 LSE Grantham Institute. [Making Transition Plans Just](#), 2022.

174 ILO. [Just Transition Finance Tool for banking and investing activities](#), 2022.

175 Impact Investing Institute. [Just Transition Criteria](#), 2023.

176 World Bank. [Assessment and Management of Environmental and Social Risks and Impacts](#), 2017.

177 IFC. [Stakeholder Engagement: A Good Practice Handbook For Companies Doing Business in Emerging Markets](#); ITUC. [ASEM project on social dialogue on working conditions](#); ILO. [Social Dialogue](#).

- **Worker and community transition plan:** The entity could address the risks and impacts identified in the environmental and social assessment with a plan to mitigate the negative effects on workers and communities. Actions can include retraining, re-employment and education, worker compensation and social protection schemes, and reinvestments in the region to promote long-term economic resilience and growth for the surrounding communities.<sup>178</sup>
- **Environmental restoration and land repurposing plan:** Remediation and reclamation of the CFPP site are important, and this plan should ensure the safety of the community. For example, it should cover the proper disposal of hazardous waste and lay out how remediation and reclamation will be financed. Beyond this, the planned use of the site should be based on local regulation and discussed with the local communities to reflect future redevelopment goals for the site.<sup>179</sup>
- **Adverse impact fund or structures with similar effects** (e.g., funds for short to medium-term work and support programs pre- and post-shut down): plans could include details of any resources to mitigate adverse impacts of early retirement, which could be in the form of specific investor capital or a stream of operating profits. Power producers may consider drawing on concessionary capital (e.g., JETPs, governments, job security guarantees,<sup>180</sup> ADB's ETM Partnership Trust Fund<sup>181</sup>), as in the other parts of the world.<sup>182</sup>

**Recommendation 8 (Mitigating adverse socio-economic impacts):** Financial institutions should assess what measures are in place to mitigate adverse socio-economic impacts, such as having (i) environmental and social risk and impact assessments; (ii) social dialogue and stakeholder engagement; (iii) worker and community transition plans; (iv) environmental restoration and land repurposing plans; and (v) adverse impact fund (or similar support measures).

*This recommendation could be captured across the components of a NZTP, but will be particularly relevant to the Engagement Strategy component.*

178 World Bank. [The Coal Transition: Mitigating Social and Labor Impacts](#), 2021; RMI. [Supporting Coal Workers and Communities in the Energy Transition](#), 2022.

179 Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022, European Commission, [Environmental Rehabilitation and Repurposing toolkit](#), 2020.

180 Queensland Government. [Queensland Energy and Jobs Plan](#), 2022.

181 ADB. [Energy Transition Partnership Trust Fund](#).

182 WEF. [Just Transition Energy Strategy, Spain](#), 2015; WEF. [Just Transition Transaction, South Africa](#), 2021; WEF. [Just Transition Fund's Blueprint for Transition, USA](#), 2015; European Commission. [Just Transition Fund](#).

### Box 23: Reference to Climate Bonds / CPI / RMI - Guidelines for Financing a Credible Coal Transition<sup>183</sup>

#### *Stage Gate 3, Just transition*

Guideline: The coal plant has a just transition plan to mitigate impacts on workers, electricity customers, and the local community.

A just and equitable transition ideally follows key guiding principles of identifying the actors that may be negatively impacted by a coal transition (recognition justice), including affected stakeholders in the decision-making process (procedural justice), distributing the burdens and benefits equitably (distributional justice), and repairing any harm during the process (restorative justice).

These guidelines focus on applying just transition principles at the asset level — where coal plant owners are likely to have greater influence — and outline the following components:

- Provide advance notice of coal plant closure and communicate clear timelines for phaseout
- Engage in stakeholder consultations and dialogues
- Conduct impact assessments
- Report on and develop plans to minimize adverse impacts on communities
- Support relief and reskilling opportunities to affected workers
- Conduct remediation and reclamation

### Box 24: Reference to LSE Grantham Research Institute - Making Transition Plans Just<sup>184</sup>

For financial institutions such as banks and investors, a first step is to anchor their net zero plans in the just transition principles from the International Labour Organization (ILO). Based on these, we have identified three key factors for financial institutions to consider in the design and delivery of their plans:

1. Anticipate, assess and address the social risks of the transition. The just transition is about understanding and acting on the distributional implications of net zero for people. Net zero plans should be designed to ensure costs and benefits are allocated fairly, particularly so that vulnerable and marginalized communities do not bear the burden of change. Therefore, the potential social risks of transition finance need to be assessed and addressed so that no one is left behind.
2. Identify and enable the social opportunities of the transition. The transition can also be shaped to deliver positive social impacts for workers, communities, and consumers. Transition plans should explore how financial institutions can seize the social opportunities of net zero, for example, to create green jobs with decent work, to eradicate energy and fuel poverty and reduce longstanding inequalities (for example, around income, gender and race).
3. Ensure meaningful dialogue and participation in net zero planning. The just transition is a process as well as an outcome, with a focus on procedural justice that means that financial sector net zero plans should support social dialogue with workers and the participation of other affected stakeholders. This should include proactive efforts to empower excluded groups. Financial institutions must also ensure they are lending to and investing in companies that are pursuing an inclusive approach.

183 Climate Bonds, CPI and RMI. [Guidelines for Financing a Credible Coal Transition](#), 2022.

184 LSE Grantham Institute. [Making Transition Plans Just](#), 2022.

**Box 25: Reference to ILO - Just Transition Finance Tool for banking and investing activities<sup>185</sup>***Four steps for embedding just transition in banking and investing activities***Foundations**

1. Assess specific implications of the climate transition and include relevant just transition considerations in the organization's corporate and net zero strategies.

**Governance**

2. Ensure commitment by board and senior executive leadership, assign responsibilities, and build capacity and skills needed for supporting a just transition.

**Implementation**

- 3.1. Product offering: Embed just transition in product development process and in existing product offering.
- 3.2. Origination: Include just transition considerations in sourcing (investments), screening, due diligence and decision-making process.
- 3.3. Lending / Investing agreements: Reflect just transition-related requirements and incentives in lending / investment agreements.
- 3.4. Measure, monitor and report on just transition related risks and generated impacts.

**Engagement**

- 4.1. Consider social aspects of a just transition in banking client relationship management processes / Engage with investees on just transition related issues and exercise voting rights.
- 4.2. Engage in dialogue with relevant actors to foster an enabling environment for a just transition and promote system-wide innovation.

**Metrics (State of play):** Meaningful metrics are central to setting targets and efficiently executing a just transition support strategy.

Additional guidance exists in relation to coal phaseout pathways,<sup>186</sup> while specialized climate change organizations such as Coal Asset Transition Accelerator and Accelerating Coal Transition may be able to provide technical assistance (see **Box 35** for more examples).

185 ILO. [Just Transition Finance Tool for banking and investing activities](#), 2022.

186 UMD Center for Global Sustainability. [Financing Indonesia's coal phaseout: A just and accelerated retirement pathway to net-zero](#), 2022; ADB. [Regional: Opportunities to Accelerate Coal to Clean Power Transition in Selected Southeast Asian Developing Member Countries](#) 2021; WEF. [Shaping the Future of Energy and Materials System Value Framework and Analysis](#), 2020.

## Financial viability

### Coal phaseout plans should support analysis of financial costs (including just transition-related costs)

Provision of financing is ultimately an economic choice. As such, a coal phaseout plan needs to demonstrate the financial viability of the entity or asset. Financial viability may be a particular challenge in relation to a single CFPP (e.g., project finance) where early retirement reduces the core cash flow generation from the asset.

New revenue streams might be developed in relation to the site, its infrastructure, and potential to generate carbon credits. Such revenues could also increase flexibility by allowing for reduced CFPP operations while providing payments for alternative capacity to enhance energy security. These are covered in more detail in **Part 3**.

The analysis of financial costs should also include analysis of transition and stranded asset risks (including but not limited to financial, operational, refinancing, insurance / reinsurance, reputational risks), asset impairment requirements, and stress testing for different scenario conditions. In cases of clean energy replacements, analysis should also account for overall switching costs and explore relevant incentive structures to reduce barriers to switching.

A coal phaseout plan could involve multiple stakeholders providing financing. They would all be expected to optimize across other considerations (e.g., just transition), and some stakeholders (e.g., providers of concessionary capital — MDBs, philanthropic capital) would condition their financing for specific uses. Such partners can also bring credibility to coal phaseout plans.

Different financing mechanisms can be used to support the viability of coal phaseout transactions and reduce overall switching / transition costs, particularly if they enable the financial benefits of the phaseout (e.g., lower energy and healthcare costs) to fund the phaseout plan (see **Part 3** of this report).

The financial viability analysis could differ, depending on the type of financial institution. As an example, banks could be interested in understanding key costs and returns over various periods, while insurers might be interested in evaluating coverage areas, periods and amounts (see **Box 31**).

#### **Recommendation 9 (Holistic financial viability analysis): Financial institutions should perform holistic financial viability analysis of a coal phaseout plan to ensure it is likely to be viable, including capturing the financial impact of socio-economic support measures and associated costs.**

- Perform financial viability analysis based on key costs and returns over the shortened lifespan through to planned early retirement date, including with reference to risks, write-downs, just transition costs,<sup>187</sup> proposed (re) financing to support the phaseout, new cost of capital, clean energy replacement costs, and any supplementary revenue streams such as from associated renewables projects, carbon credits, and retraining grants.

*This recommendation could be captured in the Implementation Strategy component of a NZTP*

### **Box 26: Reference to RMI Financing the Coal Transition (November 2021)** <sup>188</sup>

Five key principles to guide the design of financial mechanisms for the coal transition:

- 1) **Just and equitable.** Fairly distribute the costs, risks, benefits, and upsides of the coal transition among key stakeholders
- 2) **Additional.** Support the transition of plants that otherwise would continue to operate in a manner inconsistent with climate and development goals
- 3) **Managed.** Prioritize, sequence, and accelerate the transition of coal plants in a way that maximizes societal benefits and minimizes harm
- 4) **Transformational.** Align with and support the enabling environments needed to achieve a low-carbon transition
- 5) **Scalable.** Be implementable at scale, enabling significant progress on 1.5°C efforts

<sup>187</sup> E.g., accounting for potential severance payments if the plant is to shut down, retraining of workers, in the financial term sheets, accounting for labor in the business valuation, and accounting for consultation / labor union engagement costs.

<sup>188</sup> RMI. [Financing the Coal Transition](#), 2021.

### Step C: Achieving transparency and accountability for coal MPO plans

Given the young CFPP age profile in APAC, many assets face long time horizons with closures potentially taking place 10-15 years from now. This may require financial institutions to assess coal plant owner / operator disclosures against Recommendations 1-9 in multiple stages of a transaction, such as during the onboarding stage (e.g., initial assessment, due diligence) and the ongoing monitoring stage (e.g., to evaluate impacts, address risks in implementation). Long time horizons of CFPP closures may necessitate creation of near-term action plans (e.g., 18-24 month timeframe), such as counterparty plans and milestones to deliver on asset-level emissions avoidance, and account for energy security concerns.

For example, while Recommendations 1-9 can be applied during the onboarding stage supported by disclosures of criteria and rationale behind asset selection and prioritization, further assessments during the ongoing monitoring stage may address any factors hindering the delivery of the coal phaseout plan. These may include a change of political environment of the country in which the asset is located or change of the entity's strategy.<sup>189</sup> Monitoring also enables periodic assessments of the coal phaseout plan's achievement of emissions reductions, accessibility of energy replacements, mitigation of just transition issues,<sup>190</sup> and any revisions to financial viability analysis (see **Box 28**).

Beyond disclosures relating to the elements captured in Recommendations 1-9 as part of a coal asset owner / operator's net-zero transition plan, financial institutions should consider requiring additional reporting by the entity to lend further credibility to coal phaseout plans:

- General governance and incentive structure of the transaction (e.g., escalation processes, resource recourse mechanisms, disbursement schedule, or incentives or penalties) to support achievement of climate and social outcomes, which may be publicly committed to provide greater assurance and accountability.
- Ensure there are review points to dynamically adjust entity ambition levels and actions. Financial institutions can consider future plans / interventions announced by counterparties (e.g., R&D into renewables) to ensure sufficient financing to support transition.
- Reporting requirements and related compliance verification processes that are specific to the type of financial instrument(s) used (e.g., for sustainability-linked or other KPI-linked bonds).

<sup>189</sup> Where an entity may be a state-controlled energy company, entity-level diligence may need to capture broader country transition plans or processes associated with international agreements.

<sup>190</sup> For example, Impact Investing Institute "[Just Transition Criteria](#)" (2023).

As noted by the G20 Sustainable Finance Working Group (SFWG), the lack of available information such as corporate disclosures remains a key challenge in growing efforts by financial institutions to institutionalize their own net-zero commitments and embed interim targets into their operations. The SFWG has begun work to strengthen the transparency and credibility of these voluntary financial institution commitments by identifying recommended elements of a credible net-zero commitment and its supporting actions.<sup>191</sup> Stronger entity disclosures from clients and portfolio companies can help financial institutions to incorporate net-zero considerations in their operations and enhance comparability across institutions' commitments, where open climate data initiatives have emerged in response to the increasingly clear need for improved data transparency, consistency, and accessibility (see **Box 29** for example).

**Recommendation 10 (Transparency and accountability):** Financial institutions should set expectations that the entity's CFPP phaseout plan covers the key components of the [GFANZ Real Economy NZTP framework](#) and consider additional reporting on governance measures.

- The key components of the [NZTP framework](#) (see **Figure 1**) are Foundations, Implementation Strategy, Engagement Strategy, Metrics and Targets that support disclosure<sup>192</sup> and monitoring of progress, and Governance
- The entity can disclose information on its CFPP phaseout plan across the Real Economy NZTP framework components (see **Box 27** for suggested disclosures)

*This recommendation could be captured across a NZTP with particular coverage of the Governance component.*

191 G20 Sustainable Finance Working Group. [G20 Sustainable Finance Report](#), 2022.

192 See approaches under CPI's "[Emissions Accounting in Managed Coal Phaseout Finance](#)" (2023).

**Box 27: Reference to GFANZ Expectations for Real Economy Transition Plans (September 2021)<sup>193</sup>***Appendix D, Table 7*

Suggested disclosures for managed phaseout:

THEME	SUGGESTED INFORMATION TO DISCLOSE
<b>Foundations</b>	<ul style="list-style-type: none"> <li>• Explain why a phaseout plan is appropriate for the asset(s), and how it is aligned with the transition strategy.</li> <li>• Explain how the phaseout plan fits within the firm's climate-related strategies, as well as the broader firm's strategy.</li> <li>• Specify how just transition and continuity of service considerations have been considered in the plan.</li> </ul>
<b>Implementation Strategy</b>	<ul style="list-style-type: none"> <li>• Articulate the key milestones and actions of the plan, such as phaseout timings, and any key assumptions or uncertainties with the plan</li> <li>• Set out how the phaseout plan captures risks, benefits, and impacts of its implementation.</li> <li>• Explain how the phaseout plan is being financed and how this incentivizes retirement within the phaseout timeframe.</li> </ul>
<b>Engagement Strategy</b>	<ul style="list-style-type: none"> <li>• Summarize any relevant engagement or collaboration with your value chain and peers in relation to the phaseout plan.</li> <li>• Set out any relevant engagement or lobbying activities with government/ public sector in relation to the phaseout plan.</li> </ul>
<b>Metrics and Targets</b>	<ul style="list-style-type: none"> <li>• Set out baseline emissions for the phaseout assets.</li> <li>• Set out the expected GHG emissions reduction from the phaseout and their timing.</li> <li>• Set out the basis for these reductions (e.g., scope included, assumptions made).</li> <li>• Set out how the phaseout plan aligns with a relevant sectoral pathway for the asset.</li> <li>• Detail any carbon credits expected to be generated by the plan.</li> <li>• Set out progress against emissions reduction targets.</li> <li>• Set out other metrics that will be measured and monitored to track progress.</li> </ul>
<b>Governance</b>	<ul style="list-style-type: none"> <li>• Specify the escalation process if metrics of the phaseout plan are not met.</li> <li>• Articulate specific reporting in relation to financing the phaseout plan.</li> <li>• Set out level of sign-off for the phaseout plan.</li> <li>• Explain how metrics of the phaseout plan are linked to management incentives / remuneration.</li> <li>• Consider describing any retraining program and other actions as part of just transition considerations associated with the phaseout plan.</li> </ul>

193 GFANZ. [Expectations for Real Economy Transition Plans](#), 2022.

### **Box 28: Integration of GFANZ proposed three-step process with existing project financing processes**

The GFANZ proposed three-step process when assessing a coal phaseout plan can be applied to typical project financing processes; namely, the initial assessment, due diligence (DD), and ongoing monitoring stages.

The initial assessment stage determines whether potential projects meet a financial institution's investment criteria. This stage may entail a market study on the political environment and bankability of entities involved (e.g., CFPP owners / operators, offtakers, O&M contractors), as well as an evaluation of project size and financials (e.g., plant capacity, capital requirements). Similarly, Step A of this guidance outlines three levels of considerations to ensure credibility of phaseout plans: policy environment and power sector plans at the government level and entity's own plans to decarbonize — which may be considered as part of market studies — and asset-specific plans, which may be assessed alongside project size and financials.

Once a project is deemed feasible according to investment criteria and its phaseout plan sufficiently credible, a financial institution commences the DD phase to finalize its financing decision. Step B of this guidance proposes financial institutions prioritize phaseout of CFPPs that create the largest climate impact (e.g., amount of emissions reduction, number of years of early retirement), after taking into account financial viability and socio-economic impacts. Optimizing impact across these lenses can be informed by conducting financial / tax DD (e.g., revenue and cash flow projections, minimum ratios and safeguards), technical DD (e.g., baseload power, replacement sources, licenses, coal supply agreements), insurance DD (e.g., impact on existing policies, future amendments required post-transaction), ESG DD (e.g., environmental and social impact assessment), and legal DD (e.g., contractual frameworks, regulatory approvals).

Lastly, after a transaction is closed, in the ongoing monitoring stage, financial institutions periodically monitor project performance (e.g., quarterly, semiannually, annually) to assess realization of the phaseout plan, track plant performance, and address any (unforeseen) project risks in implementation. Such actions require appropriate disclosures, operating reports (including actual vs. budget results), and governance measures by the CFPP owner / operator, as outlined in Step C of this guidance.

### **Box 29: Reference to Climate Data Steering Committee - Net-Zero Data Public Utility (NZDPU)<sup>194, 195</sup>**

Data availability and quality remain major challenges for organizations seeking to understand their current GHG emissions, set science-based emissions reduction targets, and develop and implement net-zero transition plans to translate their commitments into action. For financial institutions there is the added challenge of understanding emissions profiles and climate strategies of clients and / or portfolio companies.

The CDSC was created in mid-2022 to drive momentum to build a broadly accessible foundation of high-quality climate data. The CDSC convened global regulators, policymakers, civil society organizations, and other financial market participants to discuss data needed to accelerate the net-zero transition, resulting in its proposed recommendations for the development of a NZDPU in November 2022. An open, free, and centralized climate transition-related data repository would bring transparency to financial markets and consumers, helping direct capital to low- or zero-carbon investments, increase confidence in target setting, and hold actors accountable to their climate commitments.

The release of the NZDPU proof of concept at COP28 in December 2023 is a major milestone. Supported by CDP, the proof of concept will provide an initial set of companies' Scope 1, Scope 2, and Scope 3 GHG emissions and emissions reduction targets. Once completed, the NZDPU is intended to be integrated with the UNFCCC's Global Climate Action Portal.

194 Climate Data Steering Committee. [Recommendations for the Development of the Net-Zero Data Public Utility](#), 2022.

195 NZDPU. [CDP and NZDPU Collaborate to Accelerate Access to Core Climate Data](#), 2023.

# Part 3: Financing Mechanisms

Although energy policy will remain the primary driver of a country's transition from coal to clean energy, financing mechanisms can play a catalytic role in enabling the benefits of, and overcoming barriers to, coal phaseout.

Coal phaseout presents particular challenges in terms of financing, given that phaseout implies shortening the economic life of an asset, and as such the revenue stream it generates. Innovative financial structures and levers can help ensure that the economics of an MPO transaction work for the different stakeholders involved. In 2022, GFANZ commissioned RMI to publish a working paper entitled *Financing Mechanisms to Accelerate Coal Power Phaseout* that provides further guidance.<sup>196</sup> The levers presented here align with and build on those in the RMI report for an APAC context (see **Box 30**).

In general, a number of structures and levers can be pursued, and it is likely these will need to be combined. Relying on just one or two of these levers may not be sufficient to ensure that a transaction is financially viable.

It is also likely that successful transactions — at least in the near term — may require some participation from public or philanthropic finance, including grants and concessional finance, both to confer credibility and to improve bankability, and incentivize participation. APAC countries' energy systems have received and continue to receive funding from official development assistance, so MDBs and DFIs also have an important role to play in financing the transition.<sup>197</sup>

As set out here, the broad levers are refinancing that secures a materially lower cost of capital and / or the development of alternative revenue streams. There may also be a need, particularly considering the costs of coal retirement at the system level, to secure some form of asset revaluation.

The three types of financial levers that can enable coal phaseouts are broadly:

1. **Reducing cost of capital:** Given MPO aims to reduce the lifespan of a CFPP, income that might otherwise have accrued under a PPA would be lost. Some transactions will hinge on significantly lowering the cost of capital that an asset faces, which might be achieved in part through blended finance, such as refinancing that draws on public / MDB / DFI sources that have significantly lower cost of capital, and / or through credit enhancements.
2. **Alternative cash flows:** Likewise, the associated reduction in a CFPP's revenue flow means that alternative revenue streams may be important to support the economics of an MPO transaction. There may be cases where it is appropriate to deploy emerging energy transition carbon credits, and these are being explored through various initiatives discussed in this section below. More generally, the owners of a CFPP may choose to diversify earnings and reduce dependency on coal through other income streams, such as through bundling with renewable energy projects, solar-for-coal swaps, and leasing site and grid connection to renewable energy developers. Beyond energy, repurposing the CFPP site for other industries such as tourism or property development may also be considered.<sup>198</sup>
3. **Asset revaluation and pricing:** As set out in Part 1 of this report, the business environment for owners of coal assets is changing, with increased stranded asset risk, affecting risk / return considerations and driving down fair market value. Where the asset value is subject to market forces, this may be reflected in the equity value, or may be brought about as part of an MPO transaction. If so, a reduced asset value may support the economics of a transaction, given the reduced operating period and associated cash flows.

196 RMI. [Financing Mechanisms to Accelerate Managed Coal Power Phaseout](#), 2023.

197 Oil Change International. [Public Finance for Energy Database](#), 2023; WRI. [Global Coal Risk Assessment: Data Analysis and Market Research](#), 2012.

198 Vital Energy. [Case Study: Battersea Power Station Energy Centre and District Heating](#), 2021.

Financial institutions may participate in MPO transactions in different ways. At the **asset level**, this may include investing directly or indirectly through a special purpose vehicle (SPV) owning a CFPP, or a managed transition vehicle (MTV) targeting CFPP owners. Alternatively, at the **portfolio level**, financial institutions can target holding companies owning CFPPs and other power generation assets, including renewables. Ultimately, the appropriate participation model relies on due diligence on any change-of-control provisions (e.g., in existing power purchase contracts) and potential implications.

On top of standard covenants, additional provisions may be in place depending on local, regional, or international practices to protect lenders and other investors. Financial covenants can include debt-related covenants (e.g., debt-to-equity ratio, debt service coverage ratio, debt service reserve account), ownership covenants, and ESG requirements such

as compliance with Equator Principles. For MPOs, enhanced covenants, safeguards, or credit support may be required to emphasize just transition and address investors' increased risk exposure in an MPO, given the shorter operational life and increasing risks of operating a CFPP for the remainder of its life.

The choice of financing mechanisms will be contingent on MPO contexts, including the political and regulatory environment of the country in which the CFPP is located. While no one-size-fits-all financing mechanism exists, the following are potential financial levers that may be most relevant to the different contexts of the APAC region (see **Box 30**).

- **Reducing cost of capital:** Blended capital, financial engineering, outcome-based / KPI-linked instruments
- **Alternative cash flows:** Renewable energy bundling, carbon credits
- **Asset revaluation and pricing**

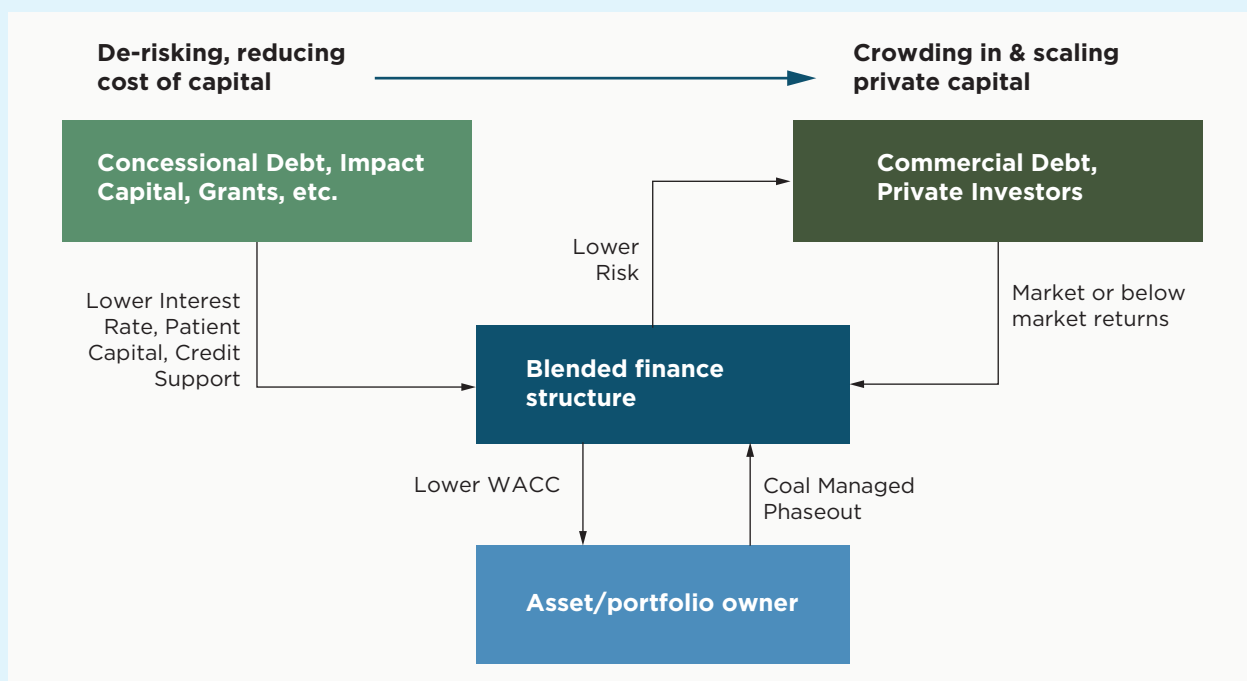
### Box 30: Deep dive: Options for financing levers in APAC

#### Blended capital

**Mechanics:** Diversifying sources of capital by using a mix of commercial and non-commercial funds (e.g., concessional or public funding, including participation from ESG impact funds, governments, MDBs, philanthropic funds, grant providers) to mitigate specific transaction risks, reduce cost of capital and overall costs (including switching / transition costs), crowd-in commercial funds / private capital, and scale future MPO transactions.

**Key considerations:** Providers of non-commercial financing may want to support just transition elements and ensure long-term scalability and replicability of MPO structures. As such, funds may be strategically used to benefit the public, such as by targeting national climate and energy objectives, supporting the social transition, and de-risking close-to-commercial MPOs.

For additional de-risking support, a first-loss guarantee may be provided by non-commercial financing to further attract commercial financing and crowd-in private capital. For insurance providers, country risk covers and / or traditional covers such as business interruption / property damage cover for plants to be phased out can be offered to support an MPO, protecting the CFPP during the transition period and lowering the cost of capital (See **Box 31**).

**Figure 10: Mechanics of blended finance structure**

**Potential safeguards:** For transactions shifting access from the public to the private markets, the private owner should continue reporting carbon emissions and the seller should adjust its own reporting framework and ambition. Debt instruments could be arranged in partnership with local financial institutions that can offer deeper understanding of the market and may have lower due diligence costs.

### Financial engineering

**Mechanics:** Financial engineering involves understanding the different terms, conditions, and structures of an MPO transaction through analysis, documentation, and operations. Several levers to explore include:

- Higher leverage to a lower overall cost of capital
- Credit support and enhancements to improve credit and operational risk profile
- Transaction structures (SPV versus portfolio-based financing, using MTVs)

**Key considerations:** Optimizing the capital structure can involve a combination of cost-of-capital reduction levers. The features of an MPO may support these levers if they create more certainty of cash flow, reduce stranding risks, etc. Some examples include:

- **Increasing leverage / higher debt-to-equity ratio:** Maximizing debt levels translating to a lower overall cost of capital (e.g., 80-90% debt). This is suitable for assets with bankable PPAs and existing debt. The required return on debt and equity should be reviewed before deciding whether to increase leverage, particularly when interest rates are rising, cash flows are concentrated late in the exit process, or alternative revenue streams are marginal. Applying this lever to CFPPs with limited or inconsistent cash flows may raise the risk of financial distress and associated costs.

- **Refinancing with longer loan tenors:** Debt service follows the operation's cash flow profile, reflecting the optimal capital structure. This is ideal for existing assets with debt partially or fully repaid and may presume repayments from additional revenue sources (even after CFPP decommissioning) to allow for accelerated CFPP retirement.
- **Debt repricing within the life of the loan:** The facility is priced at a lower benchmark tenor (e.g., based on call / non-call date) versus actual tenor of the lending. This is suitable for financial institutions and CFPPs open to potential refinancing and repricing risk at repricing date of the MPO. The all-in rate should be: 1) lower than the existing rate being paid by the issuer; or 2) higher than expected future benchmark rates, which the issuer plans to assume upon the date of repricing.
- **Deferred payments structure:** Reducing pressure on debt service by adjusting repayments to a later date, potentially decreasing risk and weighted average cost of capital of the company. This is typically offered by concessional financing and suitable for entities facing the financial burden of installment payments and the consequences of non-payment. It can be structured to offer repayment holidays, which are similar to grace periods but for mature operating CFPPs. A sustainability-linked bond (SLB)-type structure can also be designed as a deferred payment structure — instead of a coupon step-up / down, a payment of a share of the notional paid to a specific third party can remedy the negative impact of not meeting a key performance indicator.

*Credit enhancement* is a risk mitigation strategy to improve a company's credit risk profile, allowing the company to obtain more favorable financing terms from existing and / or new lenders. Traditional providers of credit enhancements include governments and MDBs, but similar facilities are also provided by commercial issuers, such as insurance and surety companies and other financial institutions. Examples include the following:

- **Direct or indirect guarantees:** Sovereign-level direct or indirect credit guarantees (e.g., providing implicit credit support through financial guarantees, enhancement of existing credit cover).
- **Commercial guarantees:** Direct or indirect guarantee by another party if the borrower defaults.
- **First loss:** Absorbing initial losses during events such as erratic cash flows.
- **Derivatives and insurance products:** Exchange rate hedges, credit default swaps, interest rate swaps, and other derivatives can help manage a financial institution's risk. Insurance can help in redefining traditional Property Damage & Business Interruption (PDBI) coverage.
- **Expanded collateral pool:** If a CFPP owner is willing, additional assets can be included on top of the existing collateral pool consisting of the coal power assets, increasing the pool of collaterals and source of recourse for potential investors, and hence lowering the risk of non-payment.<sup>199</sup>

**Potential safeguards:** Pre-agreed safeguards and mechanisms (on top of standard terms and conditions) can be integrated into transaction documents to ensure the planned coal phaseout achieves its objectives and remains credible. Examples include the following:

- **Use-of-sale proceeds aligned with decarbonization targets:** Proceeds from the sale of a CFPP (e.g., to an SPV) could be invested in broader operations aligned with decarbonization objectives.
  - *For specific use of proceeds.* Examples include pre-identified plant decommissioning of CFPPs, identifying specific renewable energy projects or upgrades to be introduced into the asset to reduce emissions (provided such upgrades do not extend the operational life of the CFPP).

199 In case an MPO defaults, an expanded collateral pool ensures that there are adequate sources of cash, such as from sale of collateral assets, for the repayment of principal invested. However, this lowers loan to value and may limit the ability to maximize leverage in an MPO.

- *For generic use of proceeds.* An example is funding renewable energy projects that pass a pre-agreed investment framework that is aligned with decarbonization and just transition targets, for a single CFPP or an entire portfolio of power plants.
- **Hiring an independent safeguard consultant:** The independent safeguard consultant should assist the lender in conducting due diligence and developing environment and social standards obligations. Additionally, the borrower should hire the consultant each year to assess compliance with these standards and report it to the lender.
- **Strict penalties for non-fulfillment of MPO objectives or targets:** These can include mandatory prepayment redemption or events of default (for debt).
- **Change-of-control provisions:** These may be added to the terms in a coal phaseout plan to ensure continuity of commitments if the CFPP were sold.
- **Grievance mechanisms:** The presence of formal channels for stakeholder feedback and concerns through the transition process.
- **Insurance and financial buffers:** Securing binding insurance coverage for execution risks during the CFPP retirement process and requiring financial buffers (e.g., reserve accounts, contingency provisions, and other financial buffers) for unplanned events.

### Outcome-based / KPI-linked instruments

**Mechanics:** Corporate-level key performance indicators (KPIs) linked to debt financing or incorporated into the debt instrument, offering lower interest rates to issuers that successfully implement sustainability or ESG targets. These are typically labeled as sustainability-linked loans and bonds (SLLs and SLBs)<sup>200</sup> and can be designed to support forward-looking, entity-wide targets.

**Key considerations:** SLBs can be used to maximize potential “greeniums” for green-labeled securities and benefit from the option premium that SLBs offer to issuers.<sup>201</sup> Issuers may also restrict the ‘use of proceeds’ from other labeled finance structures (e.g., sustainability bonds, green bonds) to avoid leakage and reinvestment into coal projects.

**Potential safeguards:** Pre-agreed safeguards and mechanisms can be integrated into the terms of the instruments to ensure the planned coal phaseout achieves its objectives and remains credible. Where the instrument is dependent on increasing ambition, the requirements around the veracity of the baseline indicators or baseline ambitions should be tested. Examples of safeguards include the following:

- **Structure:** Issuers should avoid:
  - Setting call dates prior to KPI / performance target observation dates or step-ups
  - KPI / performance target observation dates and / or step-ups that are too late in the bond’s term to be material
- **Ambition:** To ensure SLBs are sufficiently ambitious and coupon step-ups are appropriately priced, Anthropocene Fixed Income Institute has proposed pricing SLBs as straight bonds with an option attached. Greater ambition – where supported by reporting and legal guardrails (see below) – should increase the option value and more substantial coupon step-ups increase the value of the ambition, which in turn lowers cost of capital for the issuer.

200 Existing frameworks should be used to allow transition finance to flourish (e.g. [ICMA principles](#) (including SLB principles, Climate Transition Finance Handbook), regional / local regulations and frameworks on ESG, where available (e.g., Loan Market Association)).

201 See: AFII. [An option pricing approach for sustainability-linked bonds](#), 2022; AFII. [Understanding dynamics between SLB and traditional debt](#), 2023.

- **Reporting standards:** These should be set based on rigorous standards to ensure transparency in the disclosure process, minimizing greenwashing and maximizing the impact of the instrument. It is essential to ensure that the KPIs are credible and verifiable for ease of benchmarking against peers and sectoral pathways.<sup>202</sup> In the absence of universal market standards or regulatory requirements for SLBs, consistency in approach is recommended for products to be compared and priced effectively. One initiative designed to provide a credible standard is the Climate Bonds Initiative's expanded Climate Bonds Certification program, which now includes entity-level and SLB certification.<sup>203</sup> Its Sustainability-Linked Bond Database also records SLBs that demonstrate alignment and credibility with a sector-specific 1.5 degrees C pathway.
- **Legal guardrails:** Credible KPIs or commitments for carbon reduction and restrictions on additional new coal-related investments should be included in the terms and conditions of the loan or bond instrument as part of the contractual agreement, without any qualifying language or exemptions that undermine the commitment to facilitating MPO.

To link the instrument to *outcomes* as well as *ambitions*, it is recommended that commercially sensible legal safeguards be incorporated within the terms of the bond, in addition to or instead of step-up coupons, which stipulate consequences that can be applied if agreed KPIs or GHG emissions reductions are not being achieved during the life of the bond. These provisions should ensure integrity of outcomes, while facilitating the best possible uptake of transactions. For example, tiers of accountability over time may include:

- A financial penalty (or step-up coupon of at least 100 bps (as an indicative example)) as a consequence of failure to achieve a KPI or fulfill GHG emissions reduction commitments.
- If the KPI or GHG emissions reduction is not achieved after a year (or other agreed cure period), a further accountability provision could be triggered, such as a provision tied to the performance-related portion of the issuer's directors' remuneration. Another alternative, if commercially viable and in carefully considered circumstances, could be an option enabling investors to choose whether to put back the bond to the issuer in return for its price (similar to provisions commonly included in change-of-control clauses).

## Renewable energy bundling

**Mechanics:** In cases where the target CFPP owner has renewable energy (RE) projects in its portfolio that can be coupled with a CFPP scheduled for early retirement, the CFPP owner can raise funds to invest in an RE project through the proceeds of the MPO. To diversify sources of funds to invest in renewables, international trade export credit agencies or investment insurance agencies can de-risk RE projects and facilitate access to financing. RE project revenues can then be used to support debt and other payments of the CFPP scheduled for future decommissioning.

For transition investors and energy operators / developers, a solar-for-coal swap may be considered, which combines the acquisition of a CFPP with securing a contract to develop solar power. The investor receives the return through consumers / ratepayers charged with covering payment from solar power generation, repayment from purchasing and decommissioning the CFPP, and if included, financing for a just transition. Consumers should theoretically pay less due to the lower cost of solar power generation.<sup>204</sup>

202 Existing frameworks should be used to allow transition finance to flourish (e.g. [ICMA principles](#) (including SLB principles, Climate Transition Finance Handbook), regional / local regulations and frameworks on ESG, where available (e.g. Loan Market Association))

203 Climate Bonds Initiative. [Certification under the Climate Bonds Standard](#).

204 Energy Innovation. [Solar for Coal Swaps](#), 2020.

Depending on site conditions, the RE development could use or lease the decommissioned CFPP to repurpose select facilities (e.g., land, switchyard, grid connection). This helps to preserve the value of decommissioned CFPP facilities and generate additional sources of cash that may improve the economics of accelerated CFPP retirement and limit the need for concessional finance.

**Key considerations:** In addition to RE development, proposed use of proceeds may include CFPP decommissioning costs, socio-economic transitioning costs, debt repayment costs, and operational costs to maintain the portfolio and transaction structure. Due diligence will be critical to ensure technical feasibility through an RE feasibility study and / or detailed engineering design, and financial viability through an identified market offtaker (e.g., direct / captive offtaker, spot market).

This lever is potentially attractive to mitigate energy demand concerns for utilities (and to maintain revenues). In regulated markets it may be necessary to secure or renegotiate a PPA. In markets with lower cost of RE production, this lower cost can help offset the overall costs identified with a coal phaseout.

**Potential safeguards:** The target CFPP owner must account for and mitigate RE development risks to ensure the outcome and avoid greenwashing risks. Comprehensive assessments and forward-looking metrics for investment into RE development could be set to ensure energy demand is met in line with the country's power development plan. This may include asset owner capability assessments or qualifications to develop and manage RE projects.

## Carbon credits

**Mechanics:** Carbon credits are a potential way to reduce up-front costs and channel much-needed private finance into coal phaseout. The credits would most likely be combined with other financial instruments, rather than financing the coal phaseout in isolation. This means that, in practice, carbon credits would provide an additional source of concessional capital, combined with other instruments in a more complex financial structure. Indeed, a carbon crediting mechanism, among other direct carbon pricing instruments, may serve as an important policy tool as part of a comprehensive policy package to decarbonize economies (see **Box 34**).

There are two primary ways that MPO transactions can generate carbon credits:

- **Asset-level:** credits are generated from a CFPP being phased out ahead of its planned shutdown date. The emissions reductions would be tradeable as units of CO<sub>2</sub>e, with the units of CO<sub>2</sub>e sold equivalent to the expected or realized emissions reduction across the asset's life after the retirement date. These credits would be tradeable on the open market, and ultimately used to claim against climate objectives.<sup>205</sup> No projects of this nature currently exist, but several efforts are underway in APAC to define methodologies for generating these credits, and identify pilot CFPPs. Gold Standard is developing an asset-level methodology for these credits,<sup>206</sup> while the Coal to Clean Credit Initiative is selecting pilot plants for credit generation.<sup>207</sup> The GFANZ APAC Network and global Secretariat are giving technical input into both initiatives.

205 The Voluntary Carbon Markets Integrity Initiative is in the process of defining what claims can be made based on credit purchases. In practice, this remains a contentious question, particularly on how and when high-integrity carbon credits can be used against net-zero targets. See VCMII [Claims Code of Practice](#), 2023.

206 Gold Standard. [Methodology concept for the early Phaseout of coal fired thermal power plants and their replacement with green-field renewable energy generation plants](#), 2023.

207 The Rockefeller Foundation. [The Rockefeller Foundation and GEAPP To Design the World's First 'Coal-To-Clean' Credit Program in Emerging Economies](#), 2023.

- **Jurisdictional level:** credits are generated by the energy system as a whole. In practice, this means defining the boundaries of a 'jurisdiction' and considering all power sector emissions in the baseline. Credits would then be generated by any decrease in the energy system's total emissions (or emissions intensity, depending on methodology), over and above a pre-agreed baseline, through the shut-down of one or several CFFPs and their replacement with renewable energy. As with asset-level crediting, these credits would be tradeable on the open market, and ultimately used to claim against climate objectives. The Energy Transition Accelerator is the leading effort to generate credits in this way.<sup>208</sup>

**Key considerations / potential safeguards:** Methodologies for these credits require careful design and are in their infancy. Some key considerations are common to all three approaches:

- For CFFPs in voluntary markets, ensure the CFPP has passed the eligibility and verification process by third-party agencies and international certification bodies such as Gold Standard or Verra. (Also see **Box 32** for ICVCM's Core Carbon Principles (CCP) for high-integrity carbon credits and **Box 33** for MAS working paper on retiring CFFPs early using transition credits). These bodies aim to address several hurdles, such as:
  - **Additionality:** demonstration that, absent the funds generated from the credit, the asset in question would continue to operate as planned. This can, in part, be achieved by demonstrating that the fair value of the plant is positive when the credits are issued.
  - **Leakage:** assurance that a CFPP's early retirement does not expand coal power elsewhere — potentially by pairing its closure with clean power replacement in the same transaction, demonstrating a robust wider policy context that guards against leakage (e.g., through a JETP). Jurisdictional methodologies are designed specifically to address this issue, as any leakage would reduce the credits that the whole energy system can generate.
  - **Acceptance:** broad buy-in that these credits represent credible emissions reductions. It will be important to highlight to external stakeholders the unique challenges in emerging markets and developing economies with respect to coal phaseout (e.g., long-term PPAs), and that renewables' cost competitiveness in the OECD does not undermine integrity of credits elsewhere. Credits with ICVCM CCP accreditation, or UNFCCC accreditation under Article 6.4, are more likely to achieve widespread acceptance.
- For carbon credits sold to support a just transition, stakeholder engagement will be necessary in the design and implementation of benefit-sharing mechanisms to ensure they reflect the needs and priorities of different stakeholders. Emerging methodologies will need to ensure this as a minimum condition to achieve ICVCM CCP accreditation.

### Asset revaluation and pricing

CFFPs are facing a changing business and regulatory environment that increases overall stranded asset risk, affecting risk / return considerations and driving down fair market values. The increased risk profile can be observed as a discount to potential fair market value compared to values three to five years ago (see **Figure 11**).

<sup>208</sup> U.S. Department of State. [U.S. Government and Foundations Announce New Public-Private Effort to Unlock Finance to Accelerate the Energy Transition](#), 2022.

Stranded asset risk can be further broken down by the following key risk factors:

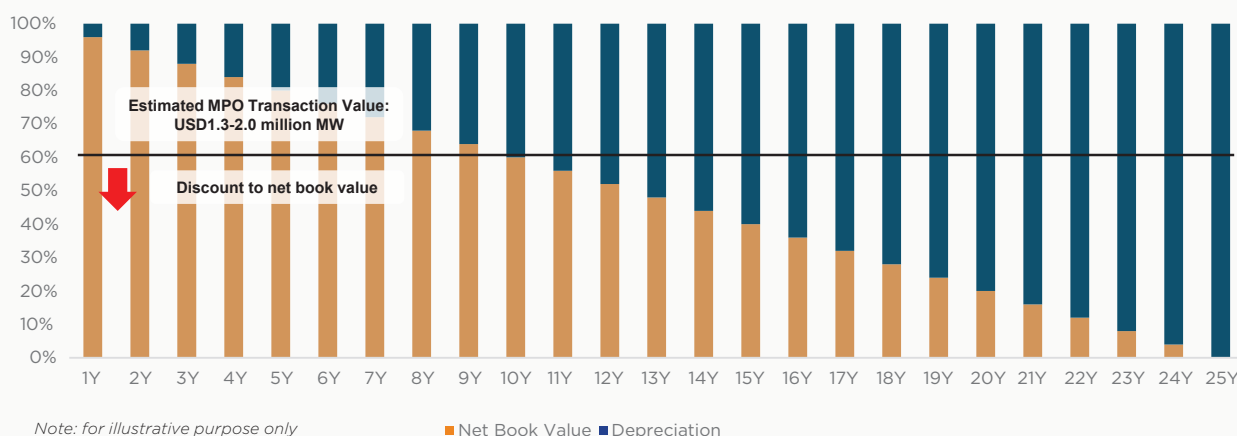
- Market risk (e.g., increased volatility of commodity prices, increased preference of clean energy over coal power from offtakers in global value chains, reduced demand from private and public offtakers due to targets aiming for CO<sub>2</sub> reduction and RE development);
- Liquidity / refinancing risk (e.g., lack of potential lenders);
- Legal / policy risk (e.g., carbon pricing, stricter air emission standards);
- Reputational risk (e.g., investors and stakeholders becoming more aggressive ensuring corporations / countries align with global targets on decarbonization); and
- Operational risk (e.g., unavailability of technical services and insurance / reinsurance).

**Figure 11: Estimated fair market value today can be below project costs of CFPPs**

Select CFPP transactions in Southeast Asia show fair market value (FMV) multiples matching or falling below project cost multiples in recent years:<sup>209</sup>

Country	ID	PH	PH	MY	IDR	PH	VND
Year	2011	2012	2014	2016	2016	2018	2020
Plant / Hold Co	Jawa Power	Quezon Power	Masinloc	Jimah East	Paiton Energy	Kauswagan	Vung Ang 2
Capacity (MW)	1,320	503	674	2,000	674	552	2,530
Cost per MW	2.2	1.8	1	1.3	1.9	1.3	1.3
FMV per MW	2.3	2.8	1.5	1.3	1.8	1.7	1.2
Buyer	Marubeni	EGCO	EGCO	Chugoku	Nebras Power	Aboitiz Power	KEPCO
Seller	YTL Power	IMS, QGC	AES	Mitsui	Engie	CAN	CLP

As a CFPP is depreciated over the course of its economic life, a sale at a later date runs the risk of realizing losses when the selling price is lower than net book value. If selling prices of CFPPs are expected to decline over the next few years due to increasing risk, CFPP owners can manage potential future losses and lock in value by refinancing today through MPOs.



209 Estimates based on public disclosure; in USD.

Lower-than-expected valuations reflecting discounts due to emerging risks are expected unless new factors come into play. These factors can include increased government / private sector support to operate CFPPs in the medium to long term (e.g., tax incentives, deductible expenses), or “earn-out” provisions for existing CFPP owners who decide to remain as CFPP owners / operators to ensure continuity and execution of transition programs, among others.

This is where potential cost-burden sharing can be set in MPOs, in which both sellers and buyers recognize the lower value of the asset, facilitating a managed phaseout.

Historically, government-led energy programs have set prices (tariffs), and even price ceilings, based on industry averages and norms. These governments usually set price levels to reflect cost plus any allowable margins within industry standards. For MPOs and other comparable structures, there are no similar government-led case studies outside German auctions.<sup>210</sup> Requiring phased shutdowns of CFPPs from 2020 onward needed strong policy backing and this was advanced even for developed markets. This also required strong government support to mitigate displacement of workers and communities.

### **Box 31: Insurer’s perspective on insuring MPO**

Many global insurance companies have adopted coal exit policies, which vary depending on alignment to different international standards.

Many APAC power markets have a significant presence of IPPs that face restrictive underwriting policies because they are not part of a larger, diversified utility. This may cause a real transition risk to CFPPs in the region if they face rising operational costs from insurance and increasing coverage gaps with lower limits available, exposing MPO investors.

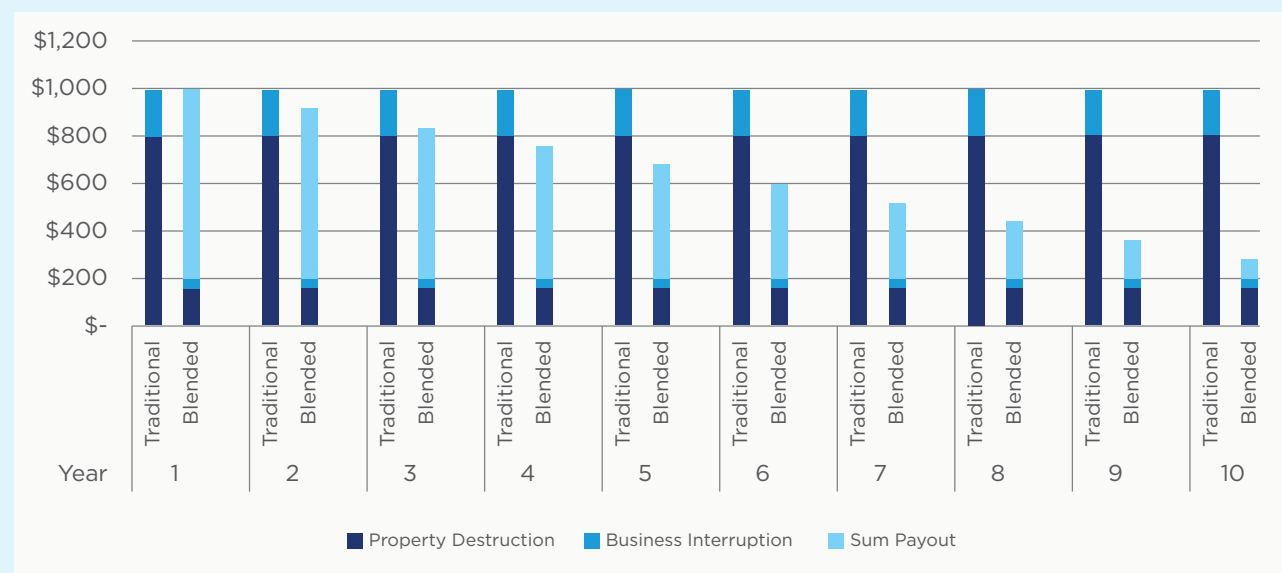
MPO plans can help overcome potential insurance challenges and reduce uncertainty in operational costs of insurance.

All parties need to be clear in their priorities and their precise insurance needs. For example, this could include:

- a) financial sponsors not seeking full asset and revenue protection, but instead coverage for their outstanding loan / investment
- b) offtaker not expecting full replacement of generation during retirement timeline (e.g., extending the retirement scheme to compensate for any business interruption events)
- c) operators only having coverage for minor repairs to keep the plant operating safely over retirement period

Under these conditions, there is a potential for a blended insurance mechanism by providing traditional Property Damage & Business Interruption (PDBI) coverage for minor losses and an ‘agreed sum payout’ for anything exceeding a certain loss threshold. Such a mechanism could provide for repair / replacement costs for minor losses, coverage of the outstanding loan amount in the event of a major loss, early retirement penalties to the offtaker, and decommissioning costs (if greater due to earlier-than-planned sun-setting). Other benefits include reduced uncertainty on insurance costs for the agreed payout (with greater appetite from insurers to provide longer-term contracts for such insurance schemes via traditional PDBI), or reduced total insured value over the retirement scheme which may reduce insurance costs.

210 WEF. [Reverse Auctions Case study: Germany's Coal Reverse Auction](#), 2021.

**Figure 12: Illustration of blended insurance mechanism**

*Note: Scheme shown with full coverage of \$1bn (80 / 20 PD / BI) and a 20% threshold on major loss triggering an agreed sum — demonstrated at covering the outstanding property value decreasing over the re-finance duration (for illustrative purposes only)*

As MPOs garner scale, capacity for CFPPs is expected to be increasingly constrained as insurers respond to a range of factors, including decarbonization of their underwriting portfolios. Therefore, there also needs to be consideration of how to provide tailored insurance to retiring CFPPs to manage volatility. Areas to be further considered could include industry mutualization (a mutual insurance company that is owned by IPPs under a coal MPO plan), associated captives with members including coal MPO entities, and insurance-linked securities, which are financial instruments whose value is affected by an insured loss event.

**Box 32: Reference to ICVCM - Core Carbon Principles<sup>211</sup>**

The Core Carbon Principles are a global benchmark for high-integrity carbon credits that set rigorous thresholds on disclosure and sustainable development. Developed with input from hundreds of organizations throughout the voluntary carbon market, the principles provide a credible and rigorous means of identifying high-integrity carbon credits that create real, verifiable climate impact, based on the latest science and best practice.

**A. Governance**

1. Effective governance
2. Tracking
3. Transparency
4. Robust independent third-party validation and verification

**B. Emissions Impact**

5. Additionality
6. Permanence
7. Robust quantification of emission reductions and removals
8. No double counting

**C. Sustainable Development**

9. Sustainable development benefits and safeguards
10. Contribution toward net zero transition

**Box 33: Reference to MAS - Working Paper on Accelerating the Early Retirement of CFPPs through Carbon Credits<sup>212</sup>**

This paper examines the key elements needed to effectively retire a CFPP early using transition credits and puts forth four key areas requiring analysis and solutions:

1. **Economics of early retirement of CFPPs in Asia:** Early retirement of CFPPs faces a significant economic gap (i.e., USD 70M per GW gap for an archetypical plant) and financing requirements (~USD 310M per GW of financing to buy out an archetypical plant)
2. **Carbon credits as an instrument for early retirement:** High integrity carbon credits can be generated from a CFPP's early retirement and replacement with cleaner energy sources -- a methodology accepted by standard setters and adhering to ICVCM's core carbon principles is crucial to unlock demand
3. **Financing early retirement transactions:** Barriers such as ensuring (i) sufficient principal protection, (ii) stability and attractiveness of returns, and (ii) alignment with net zero commitments can be addressed by innovative insurance products, creation of a futures market or price floors for credits, and regulatory acknowledgement of integrity of transactions adhering to specific conditions
4. **Early retirement project development and integrity:** Scale requires an ecosystem approach across national, sectoral, programmatic, market to transaction-level layers, with a credible transaction structure upholding just transition principles

The GFANZ APAC Network and global Secretariat gave technical input into this initiative.

211 The Integrity Council for the Voluntary Carbon Market. [The Core Carbon Principles](#), 2023.

212 Monetary Authority of Singapore. [Working Paper on Accelerating the Early Retirement of Coal-Fired Power Plants through Carbon Credits](#), 2023.

**Box 34: Role of carbon pricing in driving decarbonization**

Carbon pricing – such as emissions trading systems (ETS), carbon taxes, and carbon crediting – has been well recognized as an integral element of the broader climate policy architecture to reduce emissions cost-effectively. It helps internalize the external costs of GHG emissions by incorporating a cost of carbon into investment, production, and consumption decisions, thereby incentivizing attainment of environmental goals at least cost.<sup>213</sup> In the power sector, carbon pricing can be a powerful instrument in driving decarbonization, as it can optimize decisions on power dispatch, investment and fleet retirement and retrofit, and change electricity prices and consumption patterns.<sup>214</sup>

Despite energy price shocks and geopolitical instability in 2022, ETSs and carbon taxes have proven resilient: the share of global emissions covered by ETSs and carbon taxes has grown from 7% to around 23% in 2023 over the last 10 years.<sup>215</sup> This momentum is also taking place in APAC with Japan, Singapore, Kazakhstan, South Korea, China, and most recently, Indonesia all implementing carbon pricing instruments. However, a lack of global price on carbon leads to the issue of carbon leakage – when production, investment, or trade favors producers in jurisdictions with a carbon price compared with those without one, or with a lower price.<sup>216</sup> The IPCC indicates that with a mitigation pathway limiting warming to 2 degrees C the marginal abatement costs of carbon are around \$90/tCO<sub>2</sub> by 2030, in 2015 terms or USD 115 in 2023 terms.<sup>217</sup> As MAS notes, a globally harmonized minimum price of carbon, across sectors and countries, that is equal to the global social cost of carbon, needs to be carefully designed. Though unlikely to reach international agreement on a single global carbon price, global convergence in carbon pricing can come about through cross-border trading of carbon credits if a sufficient number of countries have carbon taxes, and the carbon border adjustment mechanism.<sup>218</sup>

Ultimately, there is no one-size-fits-all carbon pricing policy – the choice of instrument, the level of coverage, and the underpinning price can, and should be, tailored to meet domestic circumstances, priorities, and needs.<sup>219</sup> For developing Asia, it will be important to consider carbon pricing taking account of national circumstances and select an instrument, or instruments, that fit the regulatory and market tradition in the countries. ADB notes that addressing barriers to carbon pricing adoption in the region will be key, such as the prevalence of regulated power markets hindering ETS efficacy, the potential distributional impacts to consumers and businesses from a carbon tax or an ETS, and the current lack of institutional capacity and policy coordination on carbon pricing.<sup>220</sup>

ADB proposes a two-pronged approach in developing Asia. First, where possible, these barriers should be removed. Second, carbon pricing should be designed to be most effective where these challenges remain (e.g., ideas around covering indirect emissions and consumption charges to adjust to regulated power markets).<sup>221</sup>

213 ADB. [Carbon Pricing Development and Dynamics: Implications for Developing Asia](#), 2023. The cost of carbon could, in principle, represent the abatement cost needed to meet a mitigation goal, or represent the societal cost associated with the GHG emissions rising.

214 IEA. [The role of carbon pricing and electricity market reform in advancing power sector decarbonisation](#), 2022.

215 World Bank. [State and Trends of Carbon Pricing](#), 2023.

216 ADB. [Carbon Pricing Development and Dynamics: Implications for Developing Asia](#), 2023.

217 IPCC. [Climate Change 2022: Mitigation of Climate Change](#), 2022.

218 MAS. "What Does it Take to Get to Net Zero" – Keynote Speech by Ravi Menon, Managing Director, Monetary Authority of Singapore, at the Economic Society of Singapore Annual Dinner 2022, 2022. Carbon Border Adjustment Mechanism is a tariff that prices the carbon content of imported goods the same as the carbon emitted in domestic production.

219 World Bank. [State and Trends of Carbon Pricing](#), 2023.

220 ADB. [Carbon Pricing Development and Dynamics: Implications for Developing Asia](#), 2023.

221 ADB. [Carbon Pricing Development and Dynamics: Implications for Developing Asia](#), 2023.

**Box 35: Technical assistance for transition from coal to clean energy**

Technical assistance is a complementary tool to financial mechanisms as these initiatives provide expert guidance and knowledge transfer, facilitate long-term sector planning, support regulatory and policy reforms, and address environmental and socio-economic complexities. Most of these initiatives launched in 2021 following global commitments to phase out coal at COP26:

**Coal Asset Transition Accelerator (CATA)<sup>222</sup>**

Launched in 2021 by the European Climate Foundation, the Coal Asset Transition Accelerator (CATA) is a platform focused on leveraging finance to accelerate the coal transition globally. CATA aims to support the establishment of Coal Transition Mechanisms (CTM) that will finance an accelerated shift from coal use to clean energy, while also empowering key local stakeholders with cutting-edge analyses, leading expertise, and a suite of tools and resources.

**Accelerating Coal Transition (ACT)<sup>223</sup>**

Climate Investment Funds launched the Accelerating Coal Transition (ACT) investment program in 2021 to offer a holistic toolkit to support countries transitioning away from coal, tackling challenges linked to national strategies, people, and communities, as well as land and infrastructure.

**Energy Transition Partnership (ETP)'s Transition to End Coal (TRANSEND COAL)<sup>224</sup>**

Since 2021, the Southeast Asia ETP, a program managed by the United Nations Office for Project Services, has been developing a technical assistance program called TRANSEND Coal that aims to accelerate early retirement of CFPPs by helping asset owners find viable financial structures to retire CFPPs early and re-invest or repurpose assets into renewable energy. The program is designed to deliver three key outputs: (1) financial engineering for early retirement of CFPPs; (2) a revolving advisory facility for potential CFPPs with cost repayment upon deal close; and (3) knowledge dissemination of case studies from the program.

**ADB's Technical Assistance Special Fund<sup>225</sup>**

The Technical Assistance Special Fund provides grants to borrowing members to help prepare projects and undertake technical or policy studies. The fund's resources consist of regularized replenishments and direct voluntary contributions by members, allocations from the net income of ordinary capital resources, and revenue from investments and other sources.

**Supporting Coal Regions in Transition<sup>226</sup>**

Launched by the Energy Sector Management Assistance Program in 2020, the Supporting Coal Regions in Transition program helps governments in developing countries begin their transition away from coal through coal mine closure and coal plant repurposing. Support includes, but is not limited to, knowledge exchange, assistance in developing roadmaps for transition, designing pathways to preserve and grow human capital by developing comprehensive social protection packages, creating re-skilling and job transition programs, and presenting potential pathways for economic transition.

222 The [Carbon Trust](#). [The Carbon Trust to take core role in new initiative to accelerate the transition away from coal power to clean energy](#), 2021; Climate Smart Ventures. [Climate Smart Ventures to co-lead global initiative to spur the transition from coal to renewables](#), 2021; RMI. [New Initiative Unveiled to Expedite Transition of Coal Plants Globally at UN Climate Change Conference](#), 2021.

223 CIF. [Accelerating Coal Transition: Coal-to-Clean Transition](#), 2023.

224 ETP. [Powering prosperity for sustainable growth in Southeast Asia](#), 2023.

225 ADB. [Technical Assistance Special Fund](#), 2023.

226 ESMAP. [Program profile: Supporting coal regions in transition](#), 2023.

## Part 4: Enabling financial institutions to take action

Financial institutions' own transition plans, including related targets and fossil fuel-related policies and conditions, will play an important role in their ability to finance CFPP owners / operators with credible coal phaseout plans. Internal policies that preclude coal financing (e.g., financed emissions reduction targets) may have the unintended consequence of inhibiting potential MPO plans.

Divestment alone will not reduce real economy emissions and may create "climate shadow banking" where funding for CFPP owners / operators comes from less climate-conscious financial institutions. A massive divestment may also cause economic and social dislocations, as well as financial instability.<sup>227</sup>

Even where a CFPP has a credible, financially viable, and inclusive MPO plan today, and even when the plan recognizes local market contexts, internal policies and targets could prevent net-zero committed financial institutions from participating. Where internal policies preclude financing of coal, it may be helpful for such policies to outline when and how coal MPO can be financed. Similarly, financed emissions reduction targets could disincentivize financial institutions from financing MPOs due to the near-term increase in financed emissions, even though the intention is to accelerate emissions reductions. On the other hand, internal policies should progressively restrict financing to entities lacking robust and credible science-based transition plans. For example, MAS has stated that

financial institutions should not indiscriminately divest from carbon-intensive sectors, but instead carefully assess clients' transition plans and provide the needed financing where the plans are credible. MAS recognizes that there may be short-term increases in financed, facilitated, or insurance-associated emissions arising from transition plans, provided these plans support climate-positive outcomes consistent with a net-zero pathway.<sup>228</sup>

While this section details recommendations for financial institutions, these issues also require further clarity from international standard setters, governmental authorities and regulators, policymakers, and other stakeholders (see **Box 36** on the Powering Past Coal Alliance Declaration).<sup>229</sup> Policymakers and governments must send clear signals on the necessity and urgency of transition finance to decarbonize high-emitting sectors through policies, taxonomies, statements, and other measures. Policymakers involved in establishing disclosure frameworks should also clarify expectations and standards for a financial institution's transition plan disclosures to allow flexibility for financial institutions to provide transition finance to high-emitting sectors. Governments may create science-based country-level and sector-level technology roadmaps and pathways for financial institutions to use as benchmarks. Furthermore, standard setters, data preparers, and data providers should work together to improve transition-related data availability and quality.<sup>230</sup>

227 UNEPFI. [Net-Zero Banking Alliance Transition Finance Guide](#), 2022.

228 MAS. [MAS Guidelines for Financial Institutions on Transition Planning for a Net Zero Economy](#), 2023.

229 Also see The Investor Agenda. [Investor Climate Action Plans \(ICAPs\) Expectations Ladder and Guidance](#), 2022, which aims to set a common leadership agenda that elevates the best investor practices and guidance in four interlocking areas of action: investment, corporate engagement, policy advocacy and investor disclosure, and also on governance as a cross-cutting theme.

230 UNEPFI. [Net-Zero Banking Alliance Transition Finance Guide](#), 2022.

**Box 36: Reference to Powering Past Coal Alliance (PPCA) Declaration<sup>231</sup>**

The PPCA brings together governments, businesses, and organizations that are united in taking action to accelerate clean growth and climate protection through the rapid phaseout of unabated coal power in a sustainable and economically inclusive way.

The PPCA Declaration was launched on 16 November 2017, at COP23 in Bonn, and sets out a collective commitment to accelerate the transition from coal to clean energy:

- **Government members** commit to phasing out existing unabated coal power generation and to a moratorium on any new coal power stations without operational carbon capture and storage, within their jurisdictions.
- **Business and other non-government members** commit to powering their operations without coal.
- **All members** commit to supporting clean power generation through their policies (whether public or corporate, as appropriate) and investments, and to restricting financing for unabated coal power generation, i.e., without carbon capture and storage.

***A financial institution coal power policy should balance directing capital away from coal expansion or unabated coal operation with supporting the financing of credible transitions and accelerated retirement; this should complement rather than undermine the financial institution's broader climate commitments***

MPO financing policies should include a statement introducing MPO as a transition finance strategy<sup>232</sup> and setting out how it supports a financial institution's wider net-zero transition plan or strategy. The policies should also describe how MPO complements the financial institution's broader coal power restriction or exclusion policies.<sup>233</sup>

Policies should provide that MPO financing will not be provided to entities that do not have a transition plan or strategy that is aligned with science-based transition pathways by a specified target year. This restriction would include entities continuing to develop or expand CFPPs, coal mines, or other coal reserves or infrastructure.<sup>234</sup>

These policies should apply to all types of financial services (including on<sup>235</sup> and off-balance sheet activities) and should exclude from their scope financing to any entity that would contravene any of the financial institution's other internal financing policies (including in relation to coal mining). Financial institutions should also periodically revisit and update these policies as required to ensure alignment with science-based decarbonization timeframes and metrics (see **Box 37** on Powering Past Coal Alliance Finance Principles).

231 Powering Past Coal Alliance, [PPCA Declaration](#), 2017.

232 See Part 1, as well as the GFANZ. [Financial Institution Net Zero Transition Plans](#), 2022, and GFANZ. [Scaling Transition Finance and Real-economy Decarbonization](#), 2023.

233 Also see ADB. [2021 Energy Policy of the Asian Development Bank](#), 2023. ADB will focus its support to renewable and low-carbon solutions and confirm its current practice of not financing new coal-based capacity for power and heat. ADB will also support the early retirement and decommissioning of coal resources to help developing member countries achieve a planned phaseout of coal in APAC. Such energy sector operations will be conducted in line with its environmental and social safeguard policies.

234 IEA. [World Energy Outlook](#), 2021.

235 Also see ADB. [ADB Raises 2019-2030 Climate Finance Ambition to \\$100 Billion](#), 2021. An additional \$20 billion over prior commitments to deliver climate financing to its developing member countries.

Key adjustments to unabated coal divestment targets may include:

- An overall target in reference to key benchmarks, for example: immediate cessation of new coal development and phasing out coal exposure by 2030 in OECD member countries and 2040 for non-OECD members according to the IEA NZE Scenario,<sup>236</sup> country-specific targets to phase out coal, or taxonomies
- A target year to cease financing entities continuing to develop CFPPs, coal mines, or expanding coal reserves by the key benchmark year
- A target year to cease financing entities not committed to retiring existing CFPPs or mines

by the key benchmark year, with continued investment in responsible retirement vehicles until the key benchmark year in these markets to support transition

- A review of interim targets every X years, for example: every five years according to the Paris Aligned Investment Initiative's Net Zero Investment Framework.<sup>237</sup>

While being aligned with a science-based pathway, such targets also provide entities with sufficient time and send a clear signal to move assets into responsible retirement vehicles, while accounting for the delay between financing decisions and real economy impact.

### Box 37: Reference to Powering Past Coal Alliance (PPCA) Finance Principles<sup>238</sup>

The PPCA Finance Principles represent a clear and comprehensive statement of how to fully align coal power-related financial services and investments with the goals of the Paris Agreement, complementing the work of Climate Action 100+ and the Investor Agenda.

In addition to supporting the PPCA Declaration, financial institutions (as applicable depending on business model) as members of the PPCA commit to:

Theme	PPCA's Finance Principles
Financial Services	<ul style="list-style-type: none"> <li>• No project-specific financing or wider financial services for new unabated coal-fired power plants, and no project-specific refinancing or wider financial services for existing unabated coal-fired power plants that would result in their operation beyond PPCA Timeframes.</li> <li>• No new provision of financial services to companies that would result in the building of new unabated coal-fired power plants or that would be used specifically towards the generation of electricity from unabated coal beyond PPCA Timeframes.</li> <li>• Advocate for a credible public commitment to the phaseout of unabated coal power within PPCA Timeframes, by companies to which existing financial services are being provided.</li> </ul>

<sup>236</sup> IEA. [World Energy Outlook](#), 2021.

<sup>237</sup> Paris Aligned Investment Initiative. [Net Zero Investment Framework-Implementation Guide](#), 2021.

<sup>238</sup> Powering Past Coal Alliance, [PPCA Finance Principles](#), 2019.

<b>Investments</b>	<ul style="list-style-type: none"> <li>• Offer or select new products (or bespoke mandates), or make new direct investments, that avoid exposure to equity and debt instruments of companies that plan to generate electricity from unabated coal beyond PPCA Timeframes.</li> <li>• Advocate for relevant companies to seek alternatives to new unabated coal-fired power plants and advance a credible public commitment to the phaseout of unabated coal power within PPCA Timeframes, including via global initiatives like Climate Action 100+.</li> <li>• Encourage recognized investment information providers to track which companies own unabated coal-fired power plants, with an initial focus on tracking plans to build new unabated plants globally and phaseout dates for unabated plants located in the OECD.</li> </ul>
<b>Reporting</b>	<ul style="list-style-type: none"> <li>• Report policies and progress on a 'comply or explain' basis when responding to TCFD or similar annual reporting frameworks</li> </ul>
<b>Promoting the PPCA</b>	<ul style="list-style-type: none"> <li>• Encourage others to take action on coal power phaseout and promote the PPCA, including when providing advisory services or technical assistance to relevant clients.</li> <li>• Share expertise with those financial institutions still engaged in coal power financing activities.</li> </ul>

***A financial institution coal policy should set out science-based criteria to be met in order for MPO financing to be provided***

Financial institutions' coal policies should include robust, comprehensive criteria drawn from recognized, science-based guidance (such as **Recommendations 1-8** in **Part 2** of this guidance), to ensure that only responsible and credible MPOs will be eligible for financing. For example, to address moral hazard, policies should explicitly state that financing for MPOs will not be provided in relation to unabated CFPPs commissioned after a target year, such as in

accordance with the 2021 Glasgow Climate Pact, when the international community agreed to phase down unabated coal usage.

The inclusion in policies of robust, science-based criteria can help mitigate financial institution exposure to transition-related financial risks and greenwashing-related reputational and liability risks. AIGCC and ClientEarth provide recommendations on how financial institutions may guard against greenwashing risk (see **Box 38**).

### **Box 38: Reference to AIGCC-ClientEarth recommendations to guard against greenwashing risk<sup>239</sup>**

This introductory guide for Asian financial sector participants highlights issues surrounding greenwashing. It addresses the prevalence of greenwashing in financial markets in Asia and provides an overview of the regulation and guidance being developed to address it. It provides a typology of enforcement action being taken by a variety of regulatory bodies and actors against greenwashing across the globe, and identifies cases at the greenwashing frontier. One such frontier of particular relevance is that of ‘transition-washing’ – this can arise in instances where transition finance is provided to an entity using the financing for purposes not aligned with a science-based decarbonization sectoral pathway. Risks of transition-washing are heightened where finance is being provided, directly or indirectly, to the coal industry (albeit for the strict purpose of early retirement).

The guide provides key recommendations to guard against greenwashing risk. These are summarized under ‘five pillars’ as follows:

1. Screen your green: Scrutinize the accuracy and credibility of any green statement;
2. In good and green faith: Be transparent about how green objectives are integrated into the financial products and / or the firm’s financial objective;
3. Walk your green talk: Ensure the firm’s green image is consistent with the internal actions of the firm and their actions in relation to third parties;
4. Observe the changing shades of green: Expectations and regulations are rapidly evolving, so monitor developments in relevant jurisdictions;
5. Be alert to green duties: Know your legal and fiduciary duties to investors, beneficiaries and stakeholders.

### ***A financial institution’s coal policy should include its engagement strategy with CFPP owners / operators***

Financial institutions can play a significant role in supporting and advising clients and portfolio companies on their approach to net zero by proactively and constructively providing feedback and support to encourage net zero-aligned transition strategies, plans, and progress.<sup>240</sup>

Financial institutions can actively engage with entities on committing to no new investments in coal projects and adopting a climate transition plan. It is important that financial institutions engage the spectrum of CFPP owners / operators, including those that have neither climate commitments nor a transition plan today, because finance can play a pivotal role in helping entities to transition.

To mitigate financial, legal and reputational risks where engagement with CFPP owners / operators is ineffective, an escalation framework could include consequences such as more onerous / costly lending conditions, and the withdrawal of financing. MPO financing could include appropriate contractual terms providing financial institutions with the option to amend terms of financing and an early exit / divestment strategy.

At the same time, existing lending or investing is not a prerequisite for engagement with entities interested in MPO. Financial institutions can continue engaging with entities they no longer finance should such financing be undertaken when there are appropriate commitments in place.

239 AIGCC and ClientEarth. [Greenwashing and how to avoid it: An introductory guide for Asia’s finance industry](#), 2023.

240 GFANZ. [Financial Institution Net Zero Transition Plans](#), 2022.

***Financial institutions should proactively engage with policymakers to support and enable an accelerated, orderly and just transition away from coal power***

Public policy and regulation shape international, national, regional, and local strategies for transitioning to net zero, and have a significant impact on real-economy corporations as well as financial institutions. Financial institutions should conduct direct and indirect lobbying and public-sector engagement in a manner consistent with their climate commitments, to support an orderly transition to net zero.<sup>241</sup> However, a 2022 study of the world's 30 largest listed financial institutions found all 30 remain members of financial industry associations that are opposing emerging sustainable finance policy, and 15 are members of real-economy industry associations that have lobbied directly in line with fossil fuel interests.<sup>242</sup>

Recognizing that there is room to raise the ambition of national climate commitments (both economy-wide and power sector-specific), there should be a focus on ensuring that governments have robust and credible time-bound plans in place. Policy direction is crucial to create a system-level approach to power sector decarbonization. Financial institutions can help accelerate 1.5 degrees C-aligned government climate commitments and transition plans, by encouraging 'no new coal' commitments or policy to create an enabling environment for coal phaseout such as mandatory corporate disclosure requirements of material climate information,<sup>243,244</sup> fossil fuel subsidy reform, and scaling of clean power.

Public-sector engagement may also uncover the need for additional investments in areas to facilitate the MPO of coal plants (e.g., grid enhancements, battery storage, renewable energy generation, etc.). By participating in the development of energy transition plans with governments, financial institutions may design an investment mix that could include MPOs and other opportunities to mitigate risks and benefit from an evolving situation.

Public-sector engagement can be conducted as part of collective engagement initiatives (with concerns / recommendations also made public), and can build on existing analysis and expertise (e.g., IEA transition pathways, ADB pre-feasibility analyses, World Bank country-level assessments) to enhance national targets and remove potential roadblocks.<sup>245</sup>

***Financial institutions should consider using a suite of metrics to measure transition finance activities and decarbonization impact***

GFANZ's [Recommendations and Guidance on Financial Institution Net-zero Transition Plans](#) proposes in its *Metrics and Targets* theme that financial institutions establish a suite of metrics and targets to drive execution of the net-zero transition plan and monitor near, medium, and long-term progress of results. Metrics can be categorized around (1) financed emissions reductions, (2) real-economy transition, and (3) net-zero transition plan execution.

241 GFANZ. [Financial Institution Net Zero Transition Plans](#), 2022.

242 InfluenceMap. [Finance and Climate Change: A Comprehensive Climate Assessment of the World's Largest Financial Institutions](#), 2022.

243 UNEPFI. [The Future of Investor Engagement: A call for systematic stewardship to address systemic climate risk](#), 2022.

244 Also see Inevitable Policy Response Consortium. [Policy Forecast Executive Summary](#), 2021. Investors can maintain a non-partisan stance in their messaging to policymakers by focusing on issues related to financial risks to portfolios, existential risks to asset owner businesses, and transition risks to the real economy that grow in disruptive potential the more delayed the policy response becomes.

245 Also see emerging examples of policy advocacy: Broad-based investor engagement seeking strong methane regulation from the USA Environmental Protection Agency ([Ceres](#), 2022); Danish Pension industry in support of government proposal for ambitious carbon tax reform ([AnsvarligFremtid](#), 2022).

Financed emissions methodologies consider current or past emissions; they do not distinguish between financing MPOs that are expected to avoid emissions in the future. This guidance focuses on coal MPO metrics that relate to ‘financed emissions reductions’ and ‘real-economy transition’ as a complement to financed emissions metrics. It is crucial to recognize that no one metric gives all the answers, and a dashboard of metrics should be selected across key criteria.

**Financed emissions reduction potential:** PCAF’s Global GHG Accounting and Reporting Standard states that in addition to absolute emissions, financial institutions may report avoided emissions separately from Scope 1-3 inventories. RMI proposes a ‘Financed emissions for phaseout’ approach, which tackles the issue of near-term high financed emissions by categorizing eligible MPO assets into a separate sub-portfolio with distinct phaseout goals and targets. Additional metrics under this approach may include forward-looking (expected reductions in) absolute financed emissions, or emissions intensity based on planned retirement timeline,<sup>246</sup> with science-based emissions reduction targets (tailored to retirement timelines).

**Real-economy transition:** As investors increasingly engage in transition finance, climate impact metrics measuring decarbonization contribution may be used to better understand how the financing intends to improve the degree of alignment to net-zero goals. GFANZ’s [Scaling Transition Finance and Real-economy Decarbonization](#) seeks to capture the planned, real-economy emissions impact of assets and entities across the four key financing strategies as Expected Emission Reductions (EER) (see **Box 39**), where an

MPO-specific EER could be produced in relation to other financing strategies. An EER measurement has the potential to facilitate the monitoring and reporting of:

1. The unrealized emissions reduction potential impact the financing decision may have over a specified timeframe
2. The potential emissions reduction per unit of financing capital deployed

Additional forward-looking impact metrics outlined in GFANZ’s [Measuring Portfolio Alignment](#) may be considered and applied to coal MPO at the project level:

- **Maturity scale alignment:** Considers multi-dimensional criteria to bucket companies or projects into alignment categories
- **Benchmark divergence:** Compares projected cumulative company or project emissions to a science-aligned benchmark
- **Implied temperature rise (ITR):** Assesses how cumulative emissions overshoot or undershoot a net-zero-aligned pathway, translated into a global warming impact

To support transition finance (four key financing strategies) and real-economy reductions, decarbonization contribution metrics shift focus from current emissions to consider companies’ future decarbonization trajectories — supporting financial institutions in directing finance to companies most actively pushing the transition to a net-zero economy. This can provide the foundation for common approaches toward measuring alignment for MPO of high-emitting assets such as coal.

246 RMI. [Managed Coal Phaseout: Metrics and Targets for Financial Institutions](#), 2023.

### **Box 39: Reference to GFANZ - Scaling Transition Finance and Real-economy Decarbonization<sup>247</sup>**

#### *Part II, Potential decarbonization contribution methodologies*

This report outlines the Emissions Reduction Potential (ERP) method to estimate the Expected Emissions Reductions (EER) for MPO assets, and relies on three steps:

1. Constructing a representation of what would have happened in the absence of the transition-related actions (Benchmark);
2. Constructing the planned emissions impact (Projection); and
3. Comparing the difference to express the Expected Emission Reduction (Calculation).

A potential final step is Allocation of the EER to the financial institution, drawing parallels with the allocation of emissions in the creation of a portfolio footprint.

#### **Step 1: Constructing the benchmark**

##### *Basis for business as usual*

An initial BAU benchmark could be grounded on current absolute emissions and intensities of a CFPP. Business forecasts will be useful to gauge the plant's future energy production. For example, for a CFPP, in addition to generation capacity, utilization rate, and efficiency, power purchasing agreements that are in place would be relevant data points.

##### *Projecting the business as usual over time*

Various types of information might be used to adjust the starting point for the BAU benchmark. In the case of a CFPP, for example, system-level factors including government commitments and regional energy transition pathways over an extended timeline could be included to reflect shifting demand and the potential disruptive impact of low or no-emission alternatives.

At the national level, the baseline might be constructed with science-based pathways, such as the IEA Stated Policies Scenario (STEPS) for the coal sector's phaseout date. In line with such an approach, the BAU benchmark for the CFPP could incorporate gradual reductions in future planned energy generation capacity, based on a projected transition to renewable energy and coal phaseout dates at the entity and national level.

Future retirement timelines are fundamental to constructing the BAU benchmark for a Managed Phaseout transaction for the CFPP. BAU retirement timelines could be based on a number of factors, such as design life (ceiling on plant age), economic lifetime (which takes into account policy and energy market developments), and economic retirement year (e.g., when the cost of operating a plant exceeds expected revenue and / or the plant's value to the power system).

#### **Step 2: Constructing the MPO Projection**

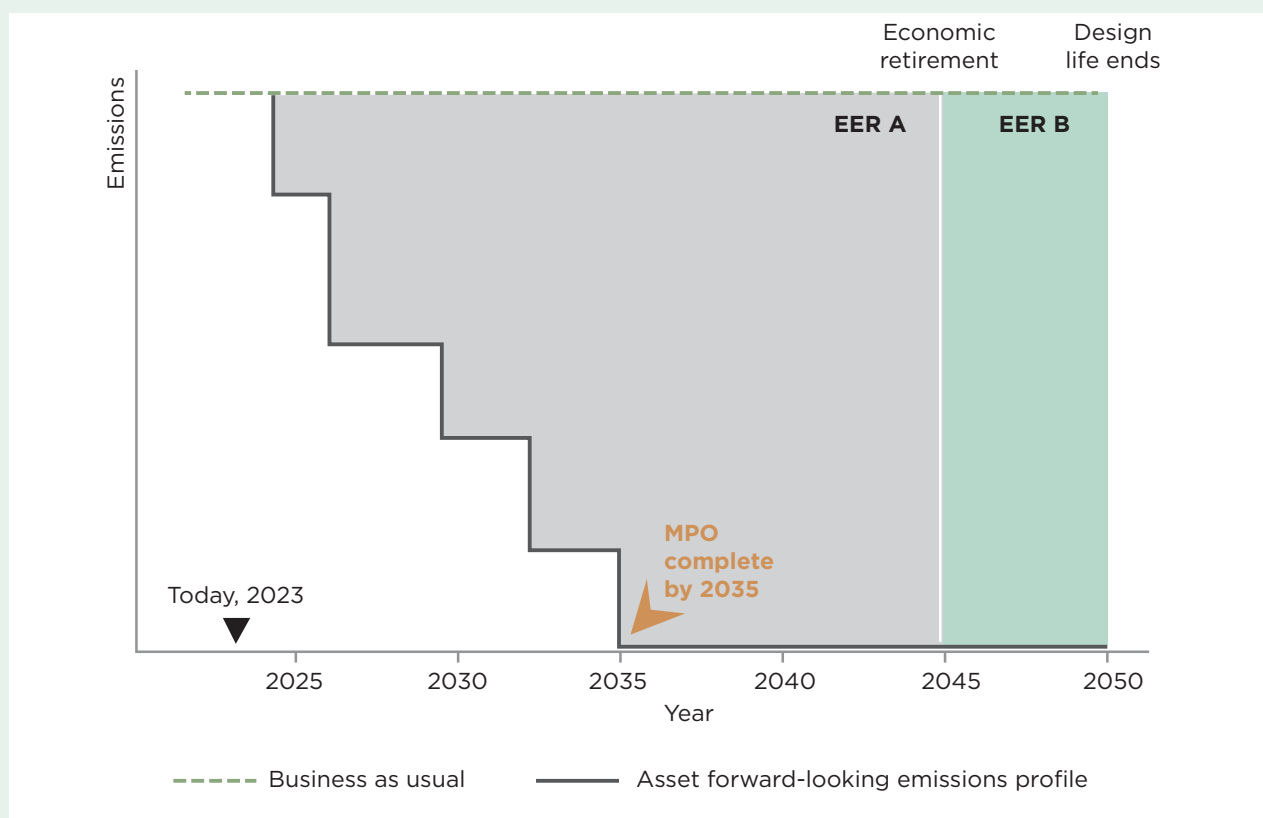
Logistically, the phaseout of a physical asset involves a number of steps between the commitment and the final retirement of the asset. These steps may encompass both technical and social considerations, including initiatives such as demand-side reductions and the scaling of renewable energy, and therefore may reflect interim emission reduction targets and detailed phaseout plans. Where this information is available and judged to be credible, any steps that impact the interim emissions profile of the asset can be integrated with the forward-looking emissions profile.

247 GFANZ. [Scaling Transition Finance and real-economy Decarbonization](#), 2023.

### Step 3: Calculating MPO EER

Figure 13 shows a sample ERP calculation for the early phaseout of a CFPP. The plant has set a number of interim milestones for capacity reduction starting in 2023 before retiring early in 2035, with adjusted utilization rates over the retirement period. The area bounded by this projection, the constant benchmark and the BAU retirement represents the EER. Depending on the chosen BAU retirement date, the EER will be larger (EER B) or smaller (EER A). In this example, the BAU operation of the asset is assumed to maintain the asset's current generation capacity and emission intensity over the plant's lifetime. An economic retirement date that also includes policy changes to the energy mix and demand projections for the asset shows an earlier date and smaller EER than the design life end date.

**Figure 13: Illustration of EER of an MPO asset**



### Allocation of EER to financial institutions

Financial institutions may consider allocating a portion of an asset or entity's EER to support internal analyses and assessments that inform their net-zero transition plans. In such instances, financial institutions will need to make assumptions or determine the approach for allocating EER.

While there is no existing allocation approach to be applied specifically to EERs, one option is to follow the PCAF Standard's attribution factor that is based on the ownership principle. The financial institution's share of EER using this allocation approach shall be proportional to the share of its exposure relative to the total (company, project, asset) value of the borrower or investee. Further work on details and implications is required to develop or modify a more specific allocation approach for EER.

# Part 5: Size of prize and case studies

## Estimating the impact of coal MPO on emissions reductions

As detailed in **Part 1**, the early retirement of coal power can serve as an important contributor to the decarbonization of APAC markets. This will need to be accompanied by rapid scaling of renewable energy sources to meet growing demand for electricity. Trade-offs, however, exist between phasing out coal quickly to maximize emissions reductions, and ramping up clean energy quickly, which may risk disruption to energy supply.

The MSCI Sustainability Institute's analysis of the 15 largest APAC markets by coal power generation aims to find a most orderly<sup>248</sup> MPO scenario by assessing feasibility of pathways based on each country's ability to replace coal with renewable sources in a timely manner. In aggregate across the APAC markets examined, early closure of coal power under orderly MPO scenarios can reduce carbon emissions by roughly 160 Gt, a reduction of three-quarters (74%) from business as usual emissions – with China (116 Gt), India (23.2 Gt) and Indonesia (5.9 Gt) the biggest beneficiaries, the analysis finds. This would achieve as much as 83% of the cumulative reductions in coal power generation emissions needed to reach net zero by 2050 while limiting average global temperature rise to 1.5 degrees C (see **Box 40**).

Other market-level studies have also assessed the economic feasibility of MPOs. Analysis by Green Finance & Development Center at FISF Fudan University and Climate Smart Ventures assessing company values of six CFPPs in Pakistan and Vietnam under several scenarios found an increase in enterprise value along with retirement several years ahead of schedule, in which CFPPs raise refinancing in 2024 at a lower cost against the promise of early retirement. If refinancing were bundled with renewable investments, enterprise values would more than triple (see **Box 41**).

In Indonesia, TransitionZero's Coal Asset Transition Tool found the country's fleet can be closed by 2040 in an affordable and just way with access to the right transition finance, costing an estimated \$37 billion (or \$1.2 million / MW). This would entail buying out a maximum of 10 years of future coal generation based on current PPA prices at current capacity factors. To put this in context, Indonesia's coal subsidies are estimated to have cost the nation more than \$10 billion in 2022 (see **Box 42**).

Achieving these emissions savings in an economically feasible way, however, requires local governments and investors to renegotiate PPAs and related contracts for coal plants, alongside wider regulatory reforms to incentivize cost-effective clean energy.

248 See Box 40 below, under 'Identifying an orderly MPO', for an explanation of how the MSCI Sustainability Institute uses the term 'orderly' in this context.

### Box 40: Reference to MSCI - Simulating a Managed Phaseout of Coal-Fired Power Plants in the Asia-Pacific Region, 2023<sup>249</sup>

The objective of this study is to simulate approaches for an orderly phasing out of coal power in the APAC region and to quantify potential carbon emissions reductions due to MPO measures.

The impact of MPO measures for CFPPs in APAC are analyzed between business-as-usual (BAU) and MPO scenarios. Varied MPO scenarios can be developed depending on the life of coal power plants and backstop year assumed.

#### Identifying an orderly MPO

The orderliness of an MPO scenario is assessed by the evenness of renewable energy capacity additions anticipated for a given market. MSCI measured orderliness of a phaseout as the standard deviation of annual renewable capacity addition schedule normalized by the average of annual capacity additions. The lower the value of this ratio, the more orderly the MPO is assumed to be.

The most orderly MPO scenario differs by market. 2040 appears to be the backstop year associated with the most orderly scenario for each of them (**Figure 14**). The most orderly MPO scenario for most APAC markets is associated with CFPPs that have operated for about 20 years, meaning they are about halfway through their useful life.

**Figure 14: Most orderly MPO scenarios for APAC countries**

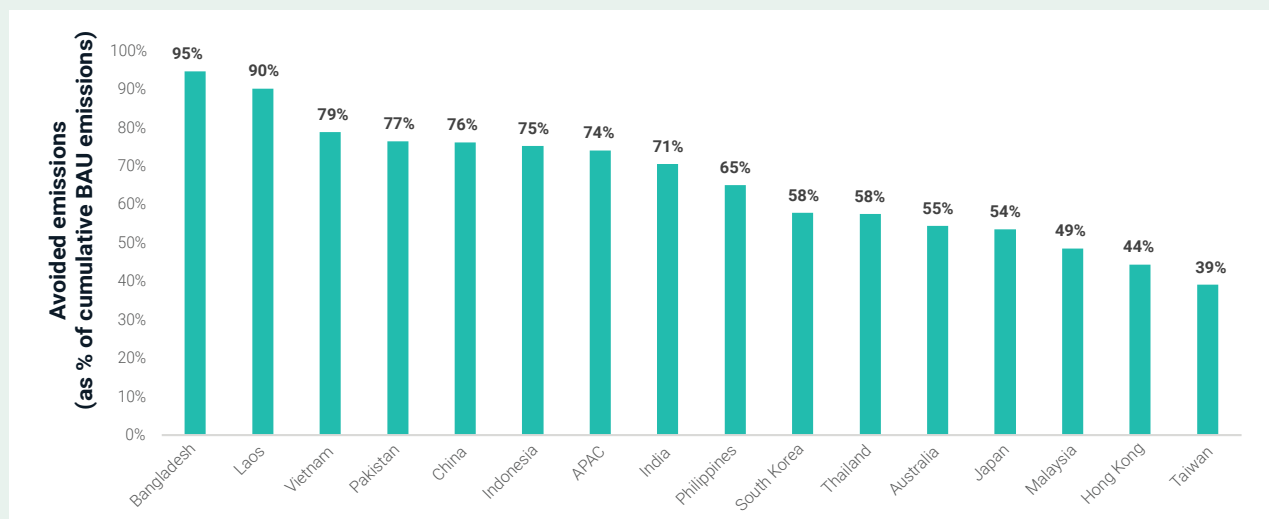


Source: MSCI Sustainability Institute

#### Avoided emissions in the most orderly scenarios

The 15 markets examined could cut their carbon emissions by nearly three-quarters (74%) on average between now and 2050 were they to follow their most orderly MPO scenario compared with business as usual (**Figure 15**).

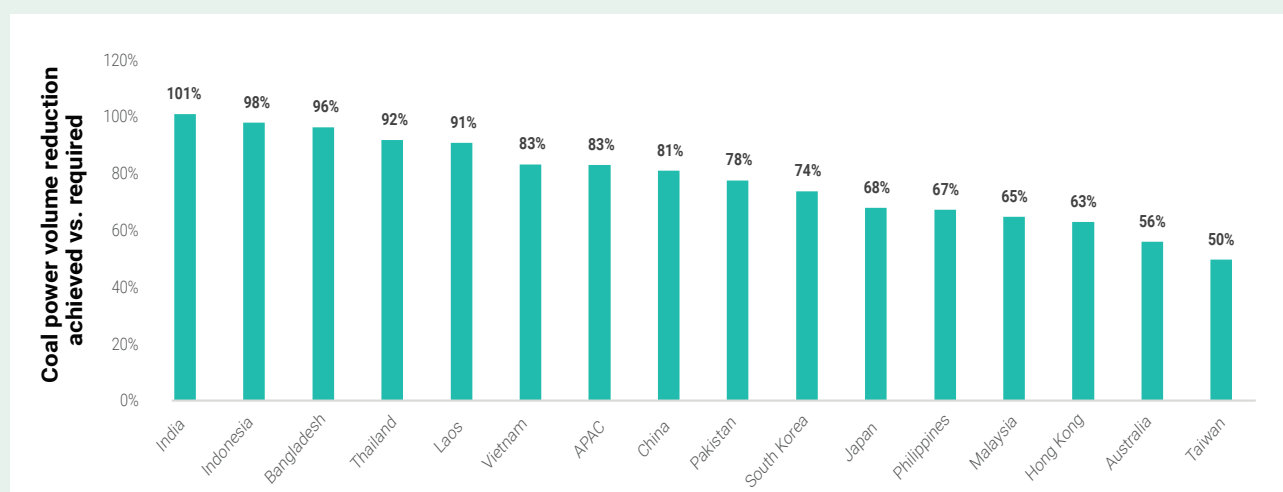
249 MSCI. [Simulating a Managed Phaseout of Coal-Fired Power Plants in the Asia-Pacific Region](#), 2023.

**Figure 15: Avoided emissions (% of BAU carbon emissions)**

Source: MSCI Sustainability Institute

To assess the extent to which MPOs would help the 15 markets achieve their net-zero targets for the coal power sector, MSCI computed a ratio (%) of coal power reduced through the cutback in coal-fired power via MPOs (vs. BAU) and the reduction in coal-fired power required in a scenario that aims to reach net zero by 2050 while limiting the rise in average global temperatures to 1.5°C.

The analysis indicates that by following their respective most orderly phaseout pathway, markets can reduce coal power generation by between 50% to 101% of the quantity each would need to achieve to remain within its share of the global budget for the coal power sector (**Figure 16**). At the aggregate APAC level, this translates to approximately 83% of the coal power reduction that would be required to reach net zero by 2050.

**Figure 16: Reduction in coal power (% of reduction required for net-zero by 2050)**

Source: MSCI Sustainability Institute

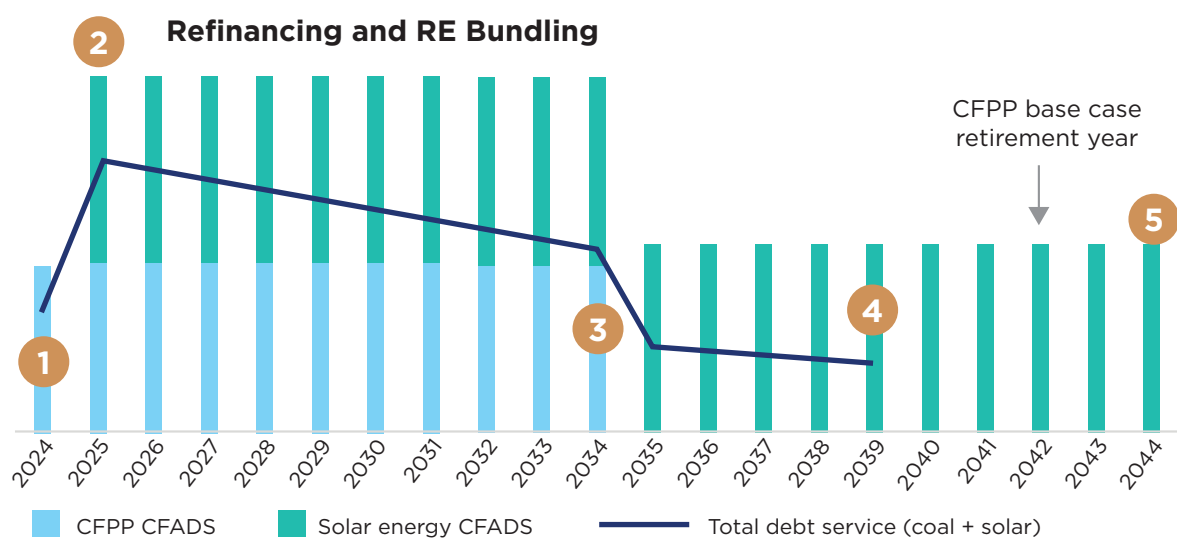
**Box 41: The case for early coal retirement in Pakistan and Vietnam<sup>250</sup>**

A study conducted jointly by the Green Finance & Development Center at FISF Fudan University in Shanghai and Climate Smart Ventures in Singapore analyzed six CFPPs with Chinese investments in Pakistan and Vietnam and found that CFPP owners could benefit from early CFPP retirement with straightforward structures such as refinancing and RE bundled investments.

The study selected CFPPs of less efficient technologies and smaller than 1 GW of installed capacity to maximize the avoided carbon emissions and simulate a realistic transition scenario (in which national power generation would not be compromised). Financial models were built for the selected CFPPs to reflect plant-specific data and estimate potential valuations of each of the CFPPs under different financing assumptions and scenarios.

Assuming a CFPP completes its contractual offtake agreement of 25 years without refinancing as the base case, RE bundling, which assumes refinancing and reinvestment of net proceeds into RE, produces the highest valuation for all plants in any scenario due to improved risk-adjusted blended returns. Meanwhile, refinancing leverages cheaper cost of capital and an optimal capital structure in exchange for early CFPP retirement, resulting in higher valuations over the base case. Despite fully operating for 25 years, the base case assumes higher risk from operating under increasingly uncertain market and regulatory conditions.

**Figure 17: Illustrative cash flows after debt service profile of a Vietnamese CFPP built in 2018 assuming refinancing and RE bundling**



1. Under RE Bundling, CFPP refinances existing debt and reinvests net proceeds into solar energy
2. The solar plant starts operations the following year and runs for 20 years
3. Refinanced debt is fully paid and CFPP retires in 2034, eight years earlier than the base case
4. The solar plant's debt is fully paid
5. The solar plant operates until year 2044

CFADS = Cash flows after debt service

250 The Third Pole. [Opinion: Retiring coal plants early can benefit investors, communities and climate](#), 2023; Green Finance & Development Center and Climate Smart Ventures. [Scenarios for financial modeling of coal retirement in Asia](#), 2023; Green Finance & Development Center and Climate Smart Ventures. [Accelerated Retirement of China's Overseas Coal-Fired Power Plants Can Unlock Massive Energy Transition Potentials for South & Southeast Asia](#), 2022.

Three scenarios were developed to assess a CFPP's valuation under potential future energy trends that contain financial implications for the CFPP:

Scenario	Business as Usual	Choose your Allies	Ministry of the Future
Key energy development	Countries prioritize energy security	Regional blocs prioritize economic and political interest	The global economy prioritizes renewable energy and climate action
Financial implications	Status quo	<ul style="list-style-type: none"> <li>• Higher tariffs and O&amp;M costs for coal</li> <li>• Lower coal financing and insurance costs</li> <li>• Higher coal energy utilization</li> <li>• Lower % of fees collected</li> </ul>	<ul style="list-style-type: none"> <li>• Lower coal and RE tariffs</li> <li>• O&amp;M costs higher for coal, lower for RE</li> <li>• Financing and insurance costs higher for coal, lower for RE</li> <li>• Lower coal energy utilization</li> </ul>

Applying the scenarios to the CFPPs revealed that Pakistan's circular debt issues<sup>251</sup> would exacerbate under a higher reliance on fossil fuel energy (e.g., Choose your Allies) due to increasing accounts receivables that worsen the CFPP's liquidity.

- These results show that transition finance, provided by new or existing lenders, may incentivize CFPPs in Pakistan and Vietnam to commit to early coal retirement. This creates a win-win situation for all: local communities will benefit from investments in renewable energy and related infrastructure, the investor will benefit from higher blended returns while limiting their risk exposure in their CFPPs, and the world will benefit from the avoided emissions of the shortened CFPP lifespan.

251 ADB. [Circular Debt Impact on Power Sector Investment](#), 2021.

#### **Box 42: Reference to TransitionZero - Financing Indonesia's coal phaseout: Coal Asset Transition (CAT) Tool<sup>252</sup>**

Despite its reliance on coal, TransitionZero's CAT tool shows Indonesia can close its coal fleet by 2040 -- a date considered consistent with the goals of the Paris Agreement -- in an affordable and just way, with access to the right transition finance.

##### **(1) Based on estimates of PPAs, it will cost \$37 billion or \$1.2 million / MW to shutter the existing coal fleet by 2040**

Early retirement of the grid-connected coal plants in Indonesia is expected to cost \$37 billion. This will entail buying out a maximum of 10 years of future coal generation based on current PPA prices (excluding the fuel cost and carbon cost components) at current capacity factors.

To put this in context, Indonesia's coal subsidies have cost the nation more than \$10 billion in the past year alone. Indonesia's first CCUS project, BP's Vorwata CCUS development, is capable of capturing and storing 25 MtCO<sub>2</sub> and is expected to cost \$3 billion, equivalent to a cost of \$120 / tCO<sub>2</sub> captured.

Beyond PPA buyouts, other financial mechanisms, including carbon pricing instruments and profit-sharing mechanisms for renewable replacement, may help to ease the financial burden but such instruments need an established ecosystem and framework to be developed.

##### **(2) Replacing coal with clean energy creates a windfall of new jobs, but not without challenges**

For coal plants in operation, most jobs are focused on operation and maintenance tasks -- translating to 1.3 jobs per MW. Meanwhile, jobs associated with solar and onshore wind are 2 jobs per MW and 5 jobs per MW respectively, encompassing construction, project development, and ongoing operation and maintenance. While not all coal plant closures will come with renewable replacement plants, it is fair to say power sector decarbonization is likely to come with net job gains at the power plant level.

Apart from direct coal power sector job losses, domestic coal plant shutdowns may negatively affect upstream mining operations, which employ 250,000 people in Indonesia, most of whom are low-skilled workers in less developed regions. The responsibility of fiscal support and training programs to transition to low-carbon jobs fundamentally lies with the state. In our estimates, we assume that the cost of just transition retraining programs would be covered by the profits embedded in existing PPAs.

##### **(3) When air, water and climate costs are included, the average operating cost of coal is \$67 / MWh, 27% more than the new cost of clean energy**

Externalities associated with air pollution, water stress and climate change on local communities, local resources, and the environment should be accounted for in a holistic view of the true cost of operating each coal plant. Translating these negative externalities into financial terms shows building and operating new renewable energy is more cost-effective than nearly all coal-fired power plants.

252 TransitionZero. [Financing Indonesia's coal phaseout: Coal Asset Transition Tool](#), 2022. The CAT tool is an open data project to help refinance and replace coal plants in an affordable and just way, allowing high-level screening of coal plants to identify and rank for replacement using one or multiple criteria. Each CAT tool metric is tied to a Sustainable Development Goal (e.g., SDG 7: Access to affordable, reliable, sustainable and modern energy).

## Case Studies

The following case study on ACEN's Energy Transition Mechanism illustrates how the recommendations of this guidance can be applied when assessing a coal phaseout plan (see **Part 2**). Subsequent case studies illustrate the benefits, application and enabling conditions of respective financial levers (see **Part 3**).

## MPO Transaction

### ACEN's Energy Transition Mechanism

**Context:** In November 2022, ACEN Corporation (ACEN), a listed energy company in the Philippines and a subsidiary of Ayala Corporation, announced its own energy transition mechanism (ETM) which scheduled the retirement of its 246 MW CFPP, South Luzon Thermal Energy Corporation (SLTEC), by 2040. The deal was the first purely commercially funded CFPP retirement transaction globally, and proceeds were used to refinance CFPP's existing debt and fund RE projects. Based on estimates, early retirement will help reduce up to 50 Mt of carbon emissions.<sup>253</sup>

**Recommendation 1 (Government climate commitments):** Financial institutions should assess the nature, strength and stability of the energy sector transition commitment of the government of the country in which the CFPP is located. Specifically, this would include the degree of alignment with 1.5 degrees C science-based pathways (i.e., national-level 'no new coal' policies or specific coal phaseout date commitments).

- At the time of the transaction in November 2022, the Philippines had not yet announced a commitment to a net zero emissions target. However, the Philippines declared a moratorium on the construction of new coal-fired power plants in 2020.<sup>254</sup>

**Recommendation 2 (Government energy transition planning):** Financial institutions should assess the extent to which there is an existing or emerging plan (including but not limited to commitment through country platforms or alignment with science-based pathways) for the energy / power system that addresses how coal phaseout will be delivered alongside necessary investment in grid infrastructure and renewables, in the country in which the CFPP is located.

- The country is targeting 35% share in the RE generation mix by 2030, which increases to 50% by 2040 at the time of the transaction.<sup>255</sup> This is supported by the Renewable Energy Act of 2008 and several market-based policy measures incentivizing RE development (i.e. Green Energy Auction Program, Green Energy Option Program, Renewable Portfolio Standards, etc.).
- In 2022, the Renewable Energy Act was amended to allow for 100% foreign ownership in RE projects.<sup>256</sup>
- In 2023, the government announced the Philippine Energy Transition Plan anchored on accelerating RE development, developing a green and smart transmission system, building port infrastructure to support offshore wind installations, and voluntary early CFPP retirement and / or repurposing.<sup>257</sup>
- In 2020, Bangko Sentral ng Pilipinas (BSP), the country's central bank, started introducing sustainability-related guidelines through the phased release of three key sustainable finance and ESG frameworks and regulations. This will be followed by several more initiatives in the pipeline, such as a conduct of climate risk stress testing by banks, the development of sustainable finance taxonomy, and more.<sup>258</sup>

253 ACEN. [Accelerating the Energy Transition](#), 2023. Asian Power. [ACEN's successful ETM deal marks a new era for coal divestment](#), 2023.

254 Department of Energy. [Advisory on the Moratorium of Endorsements for Greenfield Coal-Fired Power Projects in Line with Improving the Sustainability of the Philippines' Electric Power Industry](#), 2020.

255 Department of Energy. [National Renewable Energy Program 2020-2040](#), 2022.

256 Department of Energy. [Department Circular 2022-11-0034](#), 2022.

257 Climate Smart Ventures. [Philippine government unveils ambitious Energy Transition Plan, anchored on smart and green grid, to international partners in New York](#), 2023.

258 Bangko Sentral ng Pilipinas. [Sustainable Central Banking](#), 2023.

**Recommendation 3 (Entity coal transition plan):**

Financial institutions should assess the relevant entity's overall transition plan (both seller and buyer where applicable) — including but not limited to the specific CFPP — to gain confidence that a coal phaseout plan will be implemented and effectively mitigate emissions (e.g., an entity-level commitment to 'no new coal', or credible third-party-verified transition plan).

- In October 2021, ACEN announced its commitment to net zero emissions by 2050. Its interim target was to have a generation portfolio of 100% renewable energy by 2025.<sup>259</sup>
- In December 2022, ACEN announced the completion of its Net Zero Roadmap that includes near-term emissions reduction targets aligned with the GHG Protocol and the latest climate science and long-term targets that are consistent with the deep decarbonization of the power sector.<sup>260</sup>
- As part of the ACEN's ETM structure, ACEN has the option to buy back the CFPP in the future for implementing the early retirement, transitioning it to clean technology, and further increasing its ambition to accelerate the phaseout should enabling market conditions arise.<sup>261</sup>

**Recommendation 4 (Addressing moral hazard):**

Financial institutions should assess conditions and commitments made in relation to a CFPP subject to an MPO plan (such as whether a plant was commissioned prior to thresholds put forth by taxonomies, or international or national commitments to phase out coal; i.e., 2021 Glasgow Climate Pact) to gain confidence that the risk of moral hazard is significantly contained.

- SLTEC started commercial operations in April 2015, six years before the Glasgow Climate Pact was announced.<sup>262</sup>

**Recommendation 5 (Accelerating phaseout):** 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).

- At the time of ACEN's ETM, SLTEC's operating technical life could reach up to year 2065.

**Recommendation 6 (Climate impact):** Financial institutions should prioritize MPO plans that support alignment with a science-based pathway, with proposed emissions reductions as ambitious as possible, with public-sector endorsement or independent verification, and in line with timeframes set out by internationally recognized bodies.

- The early retirement of SLTEC will avoid up to 50 MtCO<sub>2</sub> emissions. This falls under ACEN's near-term target 1 (own generation scope 1), in which it reduces scope 1 emissions per MWh by 73.6% by 2030.<sup>263</sup>
- Under its Net Zero Roadmap, ACEN calculated its GHG footprint in detail and developed strategies to achieve net zero emissions. Complementary to ACEN's existing environmental and social framework, the roadmap laid out near-term scope 1, 2 and 3 GHG emissions reduction targets that align with a 1.5°C pathway for the power sector, while long-term targets to achieve net zero emissions are consistent with the power sector's best practice on target emissions intensity reductions to decarbonize the sector by 2040.<sup>264</sup>

259 ACEN. [ACEN commits to Net Zero greenhouse gas emissions by 2050](#), 2021.

260 ACEN. [Our Net Zero Roadmap Completion](#), 2023.

261 Asian Power. [ACEN's successful ETM deal marks a new era for coal divestment](#), 2023.

262 ACEN. [SLTEC Starts Commercial Operation of 135MW Plant](#), 2015.

263 ACEN. [ACEN's Net Zero Progress](#), 2022.

264 ACEN. [ACEN announces roadmap to reach Net Zero emissions by 2050](#), 2023.

**Recommendation 7 (Accessible, affordable clean energy):** Financial institutions should assess what measures are in place to support access to secure, reliable and affordable clean energy replacements, such as having feasibility and cost assessments of clean energy replacements, with actions underway to deliver them.

- ACEN plans to use proceeds from the ETM to construct an equivalent 600 MW solar plant.<sup>265</sup> This will also support its target to achieve 20 GW of RE by 2030 through geographic expansion, new technologies, and strategic partnerships.<sup>266</sup>
- The Philippines Department of Energy (DOE) has recognized ACEN's ETM and ACEN committed to ensuring adequate output to replace foregone coal capacity in cooperation with the DOE.<sup>267</sup>

**Recommendation 8 (Mitigating adverse socio-economic impacts):** Financial institutions should assess what measures are in place to mitigate adverse socio-economic impacts, such as having (i) environmental and social risk and impact assessments; (ii) social dialogue and stakeholder engagement; (iii) worker and community transition plans; (iv) environmental restoration and land repurposing plans; and (v) adverse impact fund (or similar support measures).

- ACEN is a member of the Council for Inclusive Capitalism (CIC) and was part of the convening group of international energy and energy-intensive companies that contributed to the release of CIC's Just Transition: A Framework for Company Action.<sup>268</sup>

- ACEN engaged with the workforce on the phaseout plan and its commitment to a just transition.<sup>269</sup> The company's phaseout plan includes a secondment program to RE operations and permanent transfers for its SLTEC workforce to ensure a just transition.
- ACEN retained an arm's length O&M agreement with SLTEC for quality assurance and to follow through on KPIs around retirement and a just transition.<sup>270</sup>

**Recommendation 9 (Holistic financial viability analysis):** Financial institutions should perform holistic financial viability analysis of a coal phaseout plan to ensure it is likely to be viable, including capturing the financial impact of socio-economic support measures and associated costs.

- The company optimized its capital structure with refinancing of both debt and equity via issuance of longer tenor debt from local banks and redeemable preferred shares from Philippine pension funds, enabling the decommissioning and transitioning of SLTEC into cleaner technology by 2040, 15 years ahead of the end of its technical life.<sup>271</sup>
- In addition, elements under Recommendation 7 (accessible, affordable clean energy) and Recommendation 8 (mitigating adverse socio-economic impacts) were part of ACEN's ETM considerations as they sought to balance the interests of multiple stakeholders.<sup>272</sup>

265 ACEN. [Accelerating the Energy Transition](#), 2023.

266 ACEN. [ACEN targets 20 GW renewables by 2030](#), 2022.

267 Manila Bulletin. [DOE opts for voluntary coal plant retirement, repurposing as 'energy transition' approach](#), 2023; ACEN. [Leading The Energy Transition Integrated Report](#), 2022.

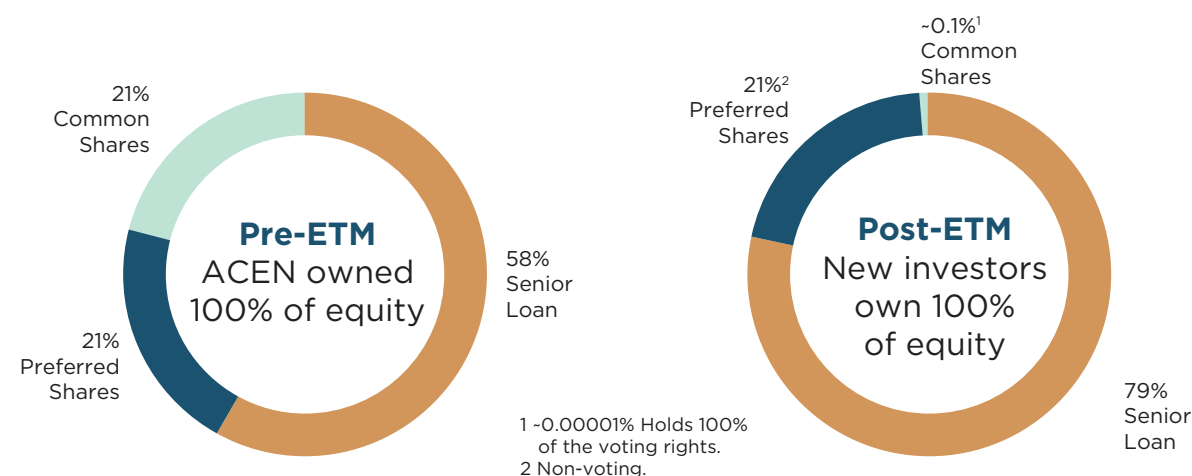
268 ACEN. [Council for Inclusive Capitalism Releases Framework to Guide Companies in Delivering a Just Energy Transition](#), 2021.

269 ACEN. [Council for Inclusive Capitalism Releases Framework to Guide Companies in Delivering a Just Energy Transition](#), 2021.

270 Asian Power. [ACEN's successful ETM deal marks a new era for coal divestment](#), 2023.

271 ACEN. [Accelerating the Energy Transition](#), 2023.

272 ACEN. [ACEN completes the world's first Energy Transition Mechanism transaction for the 246-MW SLTEC coal plant](#), 2022.

**Figure 18: ACEN's capital structure pre- and post-ETM**

Source: ACEN (2022)

**Recommendation 10 (Transparency and accountability):** Financial institutions should set expectations that the entity's CFPP phaseout plan covers the key components of the [GFANZ Real Economy NZTP framework](#) and consider additional reporting on governance measures.

- For governance, ACEN rolled out an Environmental and Social Policy in 2020 to ensure sustainability is factored into decision-making on strategy, capital allocation, business development, product development, and plant operations.<sup>273</sup>

- In November 2021, a board-level Sustainability Committee and executive level ESG Committee were set up to regularly review the company's sustainability strategies, culture, values, and performance, while an executive-level Risk and Health & Safety Committee was placed to oversee operational safety and sustainability risks.<sup>274</sup>
- ACEN received the Three Golden Arrow Awards for the year 2022 from the Institute of Corporate Directors for exhibiting best-in-class governance standards and exceeding expectations to attract more investors.<sup>275</sup>
- As a signatory to the Taskforce on Climate-Related Financial Disclosures, ACEN implements the 11 recommended disclosures.<sup>276</sup>

273 ACEN. [Measuring our impact on sustainability](#), 2023.274 ACEN. [Governance: Integrating sustainability](#), 2023.275 ACEN. [ACEN recognized for best-in-class governance standards at 2022 ACGS Golden Arrow Awards](#), 2023.276 ACEN. [ACEN commits to Net Zero greenhouse gas emissions by 2050](#), 2021.

## Blended Capital

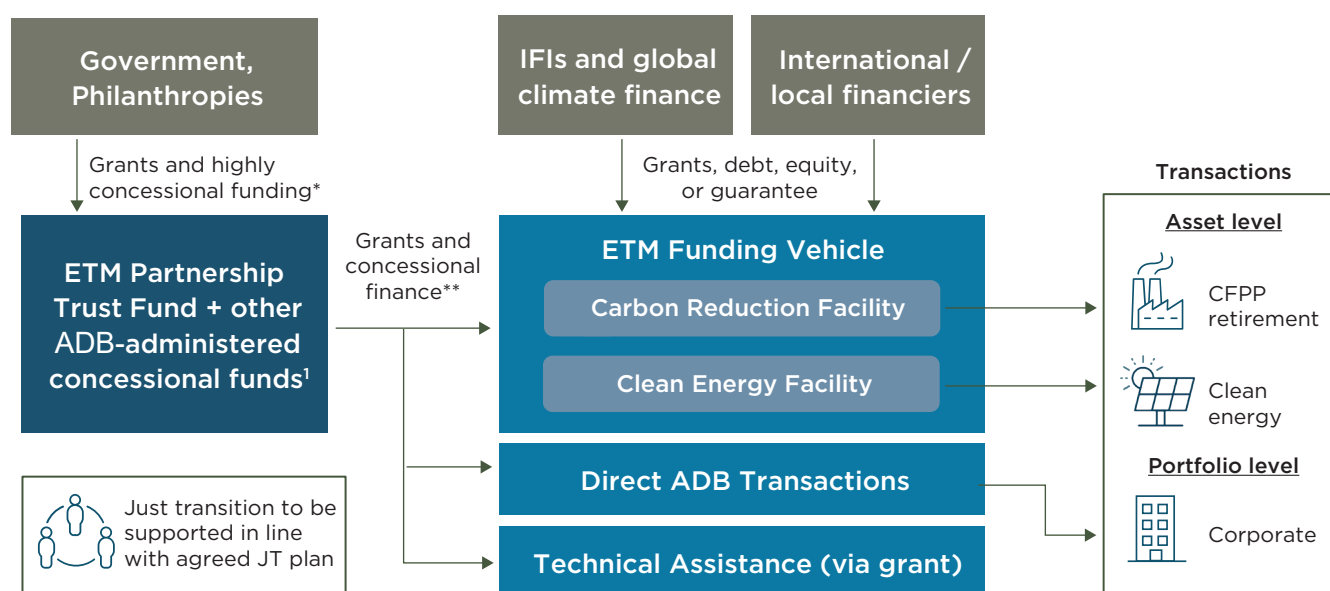
### ADB's Energy Transition Mechanism (ETM)<sup>277</sup>

**Context:** Launched in 2021, the Energy Transition Mechanism (ETM) is a program that will utilize concessional and commercial capital to accelerate the retirement or repurposing of CFPPs in Asia Pacific and replace them with clean energy alternatives. As of April 2023, ETM pilots are underway in Indonesia, Philippines, Vietnam, Pakistan, and Kazakhstan, with Indonesia being the most advanced; it has signed a memorandum of understanding with Cirebon-1, a 660 MW plant owned by Cirebon Electric Power in West Java.

### Benefits / application of structure:

- ETMs begin with country-specific feasibility studies to identify target CFPPs for the program while ensuring safeguards and just transition takes place through extensive consultations with stakeholders. The final ETM model will ultimately be tailored to account for the unique characteristics of each country.
- The ETM consists of two facilities: the Carbon Reduction Facility (CRF), which will target the CFPPs for early retirement or repurposing through refinancing, acquisition, or sustainability-linked corporate loans, and the Clean Energy Facility (CEF) which will provide financial support and technical assistance to accelerate investments in RE, battery storage, and grid upgrades.

**Figure 19: Scope of the Energy Transition Mechanism Partnership Trust Fund**



\* Grants and highly concessional funding (low-cost equity and debt), are critical to catalyze private and make ETM a success.

\*\* Concessional finance may include concessional loans, evergreen debts, junior equities, and guarantees.

1 ETMPTF has received contributions from the Governments of Japan (\$25 million) and Germany (€30 million). CIF = Climate Investment Funds. GEAPP = Global Energy Alliance for People and Planet.

Source: ADB (2023)

### Enabling conditions:

- The involvement of a multilateral bank lends credibility to the transaction, encouraging various donors and investors to provide low-cost finance.
- Extensive consultations with stakeholders during pre- and full feasibility studies ensure the ETM is tailored to local context and conditions.
- The ETM is aligned with the host country's national climate commitments, such that there is no emissions leakage from additional future investments in CFPPs.
- The ETM operates independently and is not constrained by the debt limits of the host government or target company.

277 ADB. [Update on ADB's Energy Transition Mechanism-April 2023](#), 2023.

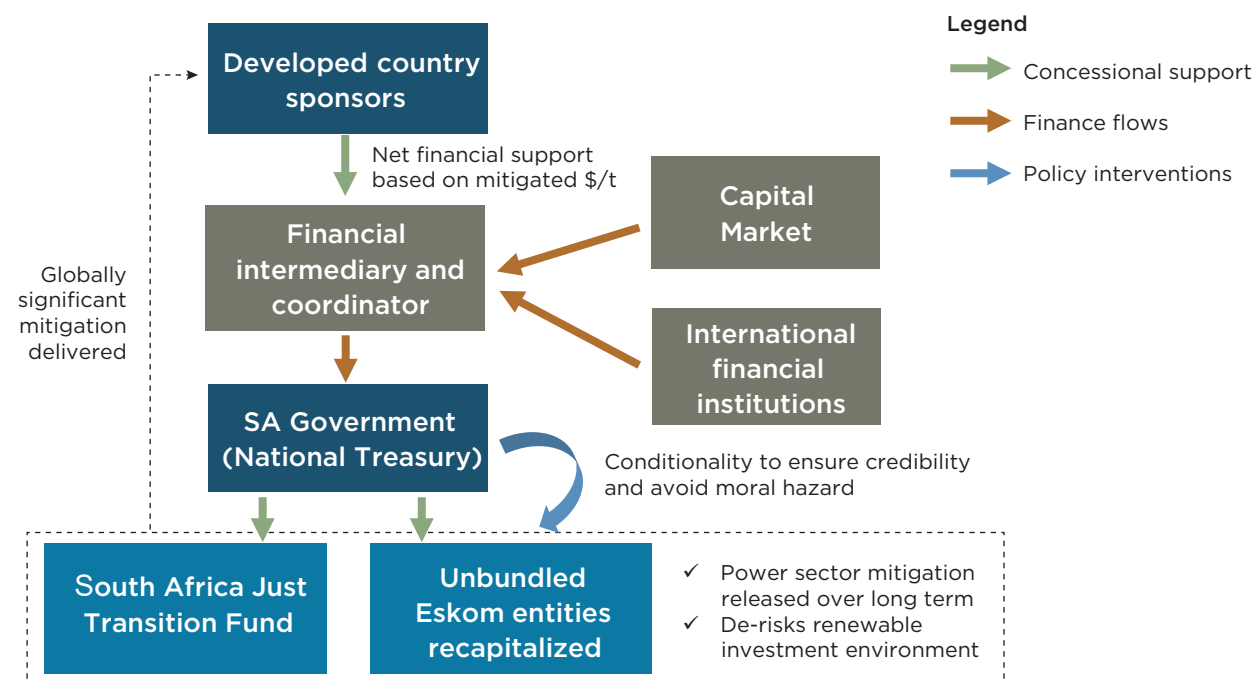
### South Africa's Just Transition Transaction<sup>278</sup>

**Context:** Conceptualized and proposed by South African think tank Meridian Economics, South Africa's Just Transition Transaction (JTT) is a prototype coal retirement mechanism released in September 2021, which partially inspired South Africa's Just Energy Transition Partnership announced later at COP26.

#### Benefits / application of structure:

- The JTT was designed to fast track the transition to affordable and just energy by using concessional debt to recapitalize the power sector,
- develop enabling market conditions through regulatory and policy reforms, reduce emissions, and support a just transition.
- Implementation of the JTT will improve the financial stability of the national utility Eskom, which could de-risk the market to attract investors for clean power and infrastructure.
- The concessional debt contains features to annually earmark funds for just transition and ensure disbursements are tied to actual emissions reductions.

**Figure 20: JTT institutional structure and flow of funds**



Source: Meridian Economics (2021)

#### Enabling conditions:

- Socialization and extensive engagement with South African society and government, and with potential developed country sponsors to develop the JTT.
- Willingness of developed country governments (France, Germany, U.K., U.S., and the European Union) to fund the concessional element of the initiative.
- Political will from the South African government to implement necessary policy, regulatory, and market reforms, including the commitment to deliver measurable emissions reductions in comparison to current policy and decommissioning trajectory.

<sup>278</sup> Meridian Economics. [The Just Transition Transaction: A Developing Country Coal Power Retirement Mechanism](#), 2021; World Economic Forum. [Coal to Renewables Toolkit: Just Transition Transaction](#).

**Bayfront's 'greenium' on sustainable CLO tranche<sup>279</sup>**

**Context:** Bayfront Infrastructure Management capitalized on a green premium ('greenium') by issuing a US\$120 million sustainable tranche 5 basis points (bps) lower than a regular note. The tranche, in the form of Class A1-SU Notes, was part of the \$401.2 million collateralized loan obligation (CLO) announced in June 2021 and backed by cash flows from project finance and infrastructure loans from Asia Pacific, Middle East, and South America.

**Benefits / application of structure:**

- Thirty percent of the A1-SU Notes issued are to be allocated to a portfolio of green and social assets that meet the eligibility criteria stated in Bayfront's Sustainable Finance Framework.
- The sustainable tranche was priced at six-months LIBOR plus 120 bps with a 3.9 year weighted average life (WAL) compared with a 125 bps conventional tranche with the same WAL and AAA rating by Moody's.
- For investors, a green label is valuable because it lowers information costs and environmental risks. For issuers, a green label reduces financing costs.
- A collateralized structure can be an attractive alternative to blended finance by bringing in "first loss" investors with a high return expectation that matches a high level of risk, while allowing fixed income investors to participate at the mezzanine and senior levels.

**Figure 21: Five classes of notes issued by Bayfront Infrastructure Management**

Class	Amount issued (US\$ million)	Issued Ratings (Moody's)	Spread <sup>1</sup>	Legal Maturity Date
A1	176.9	Aaa (sf)	125 bps	11-Jan-2044
A1 – SU	120.0	Aaa (sf)	120 bps	11-Jan-2044
B	33.3	Aaa (sf)	185 bps	11-Jan-2044
C	22.1	Aa3 (sf)	235 bps	11-Jan-2044
D	8.8	A3 (sf)	340 bps	11-Jan-2044
Pref Shares <sup>2</sup>	40.1	Not rated	N.A.	-

<sup>1</sup> Spread is originally applied over 6 months LIBOR. Effective 11 July 2023, the base rate of the Notes will switch from LIBOR to Daily Non-cumulative Compounded SOFR plus credit adjustment spread of 42.826 bps.

<sup>2</sup> US\$30.1 million of the Pref Shares are retained by Bayfront; and US\$10 million of the Pref Shares are held by a third-party investor

Source: Bayfront Infrastructure (2023)

**Enabling conditions:**

- The sustainable tranche was recognized by the Singapore Exchange for meeting recognized standards for green, social, or sustainability fixed income securities
- It also met the eligibility criteria of Bayfront's Sustainable Finance Framework, such as management and use of proceeds for green and social projects, allocation and impact reporting, external review pre- and post-issuance.

279 IFR Asia. [Bayfront CLO scores Greenium](#). 2021; Bayfront Infrastructure. [BIC II](#), 2023.

## Financial Engineering

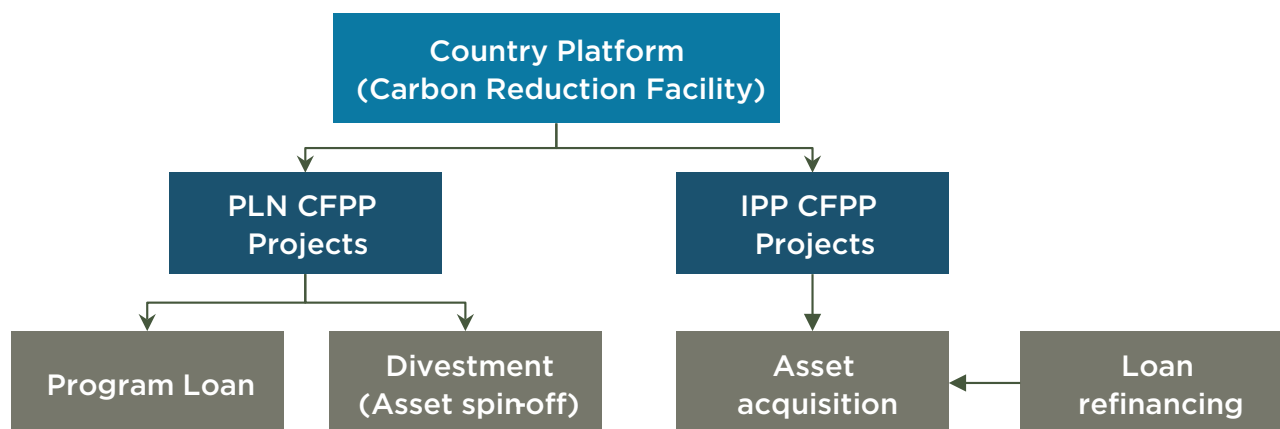
### Indonesia's ADB ETM financing structures<sup>280</sup>

**Context:** Launched in November 2022, Indonesia's Energy Transition Mechanism Country Platform (ETMCP) is a delivery vehicle that will oversee the broad structure of coal phaseout transactions requiring the use of government facilities (e.g., government incentives and guarantees, private-public partnerships). Following the principles of ADB's ETM, ETMCP serves as a funding and financing framework that will channel and blend fiscal support from the Government of Indonesia to support the transition from coal to RE, targeting CFPPs owned by state electricity company Perusahaan Listrik Negara (PLN) and independent power producers (IPPs).

### Benefits / application of structure:

- For PLN, the ETM will provide blended finance in two ways:
  - It will receive the program loan with KPIs linked to disbursement indicators and an exclusion list for use of proceeds.
  - It will place selected CFPPs under SPVs, which will have new PPAs. The SPV will then receive a program loan with KPIs. PLN will sell the SPV to PT Sarana Multi Infrastruktur (SMI), a state-owned infrastructure financing company, and potentially strategic investors.
- For an independent producer, their CFPP will be acquired by an SPV to be owned by Indonesia Investment Authority (INA) and SMI, the state-owned infrastructure financing company. The SPV will then receive a program loan with KPIs.

**Figure 22: Potential support of Country Platform Manager to the transaction**



Source: PT SMI (2022)

Note: These transaction structures are not final and will be adjusted to prevailing market conditions

### Enabling conditions:

- INA was appointed as the investment partner, while SMI was appointed the implementing agency and tasked to develop a financing and investment framework for the program. SMI may also support the platform through other de-risking instruments in accordance with Ministry of Finance regulation.
- Various institutional partners are participating for grants, financing, knowledge, and technical assistance.
- Pending formalization by the Ministry of Finance, ETMCP's governance structure will be a strategic enabler, as it will determine ETMCP's scope and authority.

<sup>280</sup> PT SMI. [Energy Transition Mechanism \(ETM\) in Indonesia](#), 2023; PT SMI. [Indonesia Launches ETM Country Platform to Accelerate Just and Affordable Energy Transition](#), 2022.

**Vistra Energy Corp.'s asset refinancing<sup>281</sup>**

**Context:** Texas-based Vistra Energy Corp. (Vistra) has refinanced over \$8 billion of debt, at lower interest rates and extended maturities, to support decarbonization of existing business lines such as coal-fueled generation facilities and further diversification into low-to-no emission businesses, primarily renewables and energy storage. Vistra is deploying these levers to achieve its 60% Scope 1 and Scope 2 GHG emissions reduction target by 2030 (as compared to a 2010 baseline) and has a long-term goal to achieve net-zero carbon emissions by 2050. Since 2019, Vistra has retired approximately 6 GW of coal-fueled generation facilities and has announced the retirement of an additional 4.6 GW of capacity by 2027. Vistra is redeveloping all nine of its retired and to-be-retired coal plants into solar and / or energy storage facilities.

**Benefits / application of structure:**

- Refinancing improved the company's liquidity and freed up capital to expand its portfolio of solar energy and battery storage projects.
- As Vistra manages CFPP retirement and clean energy development, the company can prepare for and implement a just transition for the affected workforce and communities.
- The transition from coal to clean power will reuse select coal facilities for solar and battery storage, ensuring sustainable and continued power supply.
- The planned CFPP retirements will support Vistra as it pursues its GHG emissions reductions.

**Figure 23: Timeline of planned retirement of coal plants**

Note: May retire earlier than expected dates shown above if economic or other conditions dictate

Source: Vistra Climate Report (2020)

**Enabling conditions:**

- Vistra is a large public company, listed on the New York Stock Exchange, with a strong balance sheet and track record operating in a sophisticated capital market.
- Competitive solar energy prices, environmental regulations, issues with the wholesale power market operator, and state efforts to eliminate coal have accelerated the phaseout.
- Vistra set up a dedicated team for asset closure to ensure proper decommissioning and reclamation of retired plants and mines.

281 World Economic Forum. [Coal to Renewables Toolkit: Asset Refinancing](#); Vistra. [2022 Annual report](#), 2023; [2019 Annual Report](#), 2020; [Vistra Energy Corp. Vistra Accelerates Pivot to Invest in Clean Energy and Combat Climate Change](#), 2020; Vistra. [State of Illinois Enacts Landmark Energy Transition Legislation That Includes Vistra's Coal to Solar & Energy Storage Initiative](#), 2021; S&P. [UPDATE: Vistra net-zero pledge includes coal plant retirements, solar additions](#), 2020.

## Outcome-based / KPI-linked instruments

### Tauron Polska Energia's SLB<sup>282</sup>

**Context:** Tauron Polska Energia issued Poland's first sustainability-linked bond (SLB) in November 2020, a five-year \$250 million bond to fund Tauron's energy transition and decarbonization program. Proceeds are restricted from being used for existing or new CFPPs and will instead be deployed to investments in grid upgrades and RE projects.

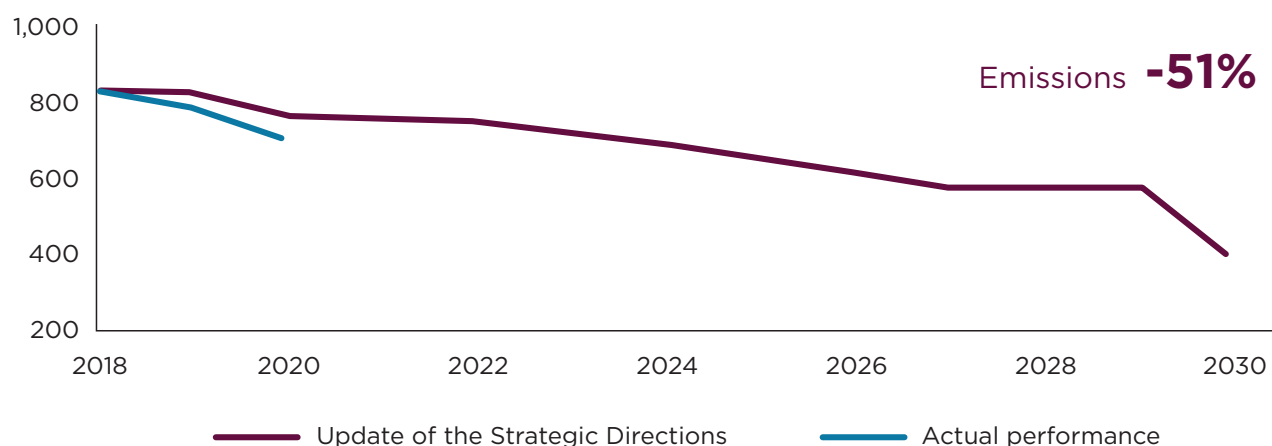
### Benefits / application of structure:

The following key performance indicators were defined:

- Annual reduction of CO<sub>2</sub> emissions at 2% on average
- Annual increase of RE generation capacity at 8% on average

Failure to meet indicators by 2030 will result in an increase in the base margin in accordance with the issue terms and conditions. A third-party auditor conducts annual checks and certifies the accuracy of the indicators' calculations.

**Figure 24: Historical (2018-2020) and planned (2018-2030) CO<sub>2</sub> emissions level by Tauron Polska Energia**



Source: Tauron Polska Energia (2020)<sup>283</sup>

### Enabling conditions:

- Structure provides a clear financial incentive and is flexible on how sustainability targets can be met.
- Carbon emissions are accurately and reliably measured, and use of proceeds can be verified.
- Funds are sourced by a diverse pool of investors that helps spread the risk and lowers overall cost of financing.

<sup>282</sup> World Economic Forum. [Coal to Renewables Toolkit: Sustainability-Linked Bond](#); Argus Media. [Poland's Tauron issues bonds to finance renewables](#), 2020.

<sup>283</sup> Tauron Polska Energia. [TAURON Capital Group's strategy and business model in the context of climate protection requirements](#), 2020.

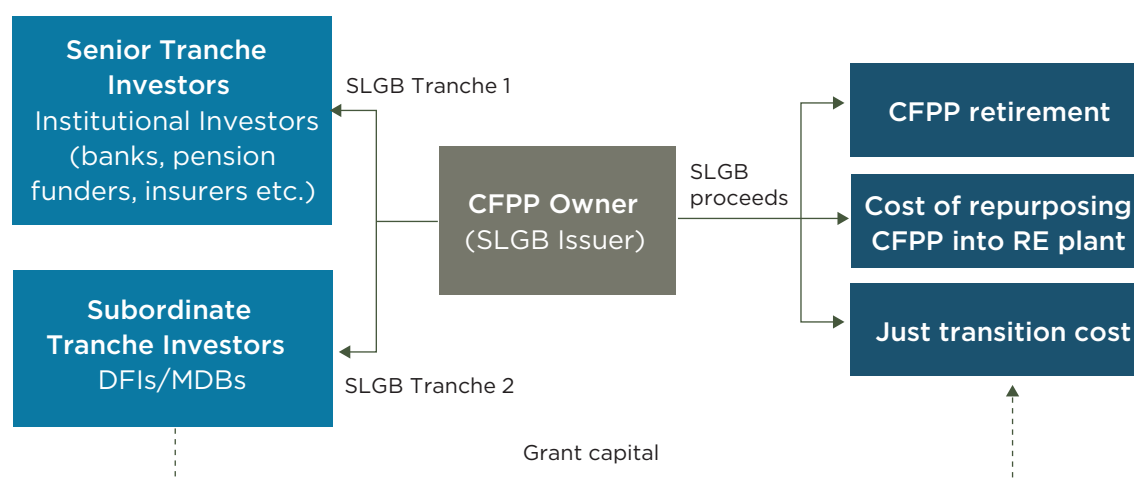
### **The case for blended sustainability-linked green bonds for Indian IPPs<sup>284</sup>**

**Context:** India's climate targets are being hampered by the energy and socio-political sensitivities surrounding CFPPs. To overcome this, the IEEFA proposed the use of sustainability-linked green bonds (SLGBs) for IPPs as a capital market-based solution to transition from coal to clean energy and ensure a just transition. A vanilla sustainability-linked bond is structured around ESG performance indicators, but proceeds can end up funding non-green projects. The SLGB mechanism would ensure issuers use the funds for their intended purpose.

### **Benefits / application of structure:**

- In the March 2023 report, proposed SLGB structures tie KPIs and proceeds to specific projects, addressing potential greenwashing concerns and enhancing the bonds' credibility. Under this proposal, IEEFA recommends three KPIs:
  1. Setting an ambitious CFPP decommissioning date
  2. Generating RE prior to, or on the date of, CFPP decommissioning
  3. Providing compensation packages and re-skilling / hiring programs
- SLGBs can be issued in senior and subordinated tranches or obtain credit guarantees to facilitate access to lower financing costs.

**Figure 25: Proposed structure for SLGBs to repurpose CFPPs**



Source: IEEFA (2023)

### **Enabling conditions:**

- Proceeds are ring-fenced to specific KPI-fulfilling projects to ensure transparency and prevent misuse of funds.
- Issuer has a strong track record in RE development and is sincere in meeting climate commitments.
- Institutional and concessional investors are willing to participate in the issuance.

284 IEEFA. [Repurposing India's coal power plants: Sustainability-linked green bonds as a financing solution](#), 2023.

## Renewable energy bundling

### The energy transition and socio-economic transformation of Andorra's former Teruel Coal Plant<sup>285</sup>

**Context:** After 40 years of operations, Enel Group's 1,050 MW Teruel thermal power plant in Andorra was shut down in 2020. More than €1,500 million will be used to implement a comprehensive industrial, technological and socio-economic development plan. The plan includes the installation of over 1,800 MW of new renewable capacity with unique hybrid technologies, and the creation of more than 6,300 jobs from initiatives in the primary, secondary, and tertiary sectors.

#### Benefits / application of structure:

- Replacement energy will be generated from investments in: 14 renewable energy projects hybridized to improve the efficiency of the facilities and produce an output greater than the capacity of the plants; two battery storage projects to maximize RE production; a green hydrogen project to help decarbonize industries in the surrounding

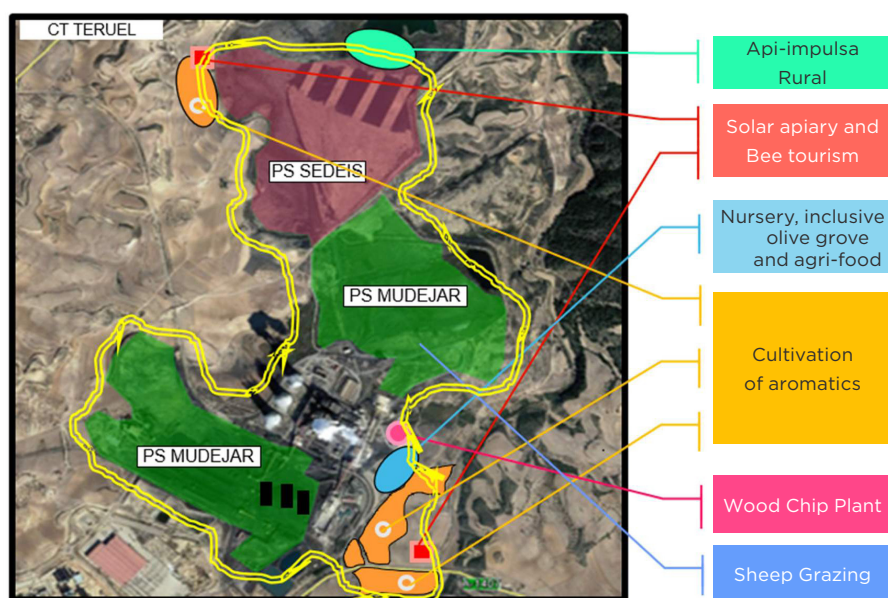
area; and a synchronous compensator to enable more frequent RE discharge for improved grid performance.

- The socio-economic plan takes advantage of the region's resources and promotes unique and agrivoltaic activities, such as plant nurseries, organic farming, olive cultivation, and sheep grazing for land clearance. Under the manufacturing sector, projects include a solar tracker factory, a precast concrete factory, and a center providing a second life for wind turbines. The plan also features projects to promote local commerce and energy-related tourism activities, such as apiaries installed in select solar plants.

#### Enabling conditions:

- Enel Group won the government tender to turn Andorra into a fair transition hub.
- The company worked with various stakeholders in the design and execution of the socioeconomic plan, which involved integrating strategic sectors, collaborating and partnering with companies and local entities, and ensuring training and employment.

**Figure 26: A map of primary and tertiary sector initiatives in surrounding solar plants**



Source: Endesa (2022)

<sup>285</sup> World Economic Forum. [Coal to Renewables Toolkit: Coal to Solar, Wind and Storage, Andorra Thermal Power Station](#); Enel Green Power. [The end of an era in Teruel and the beginning of a different future](#), 2022; Endesa. [Endesa has presented its future plan for Andorra that will create 500 permanent and lasting jobs in the area within 5 years](#), 2022; Endesa. [Futur-e in Teruel](#), 2023

## Carbon Credits

### **Pricing ENGIE's avoided carbon emissions**<sup>286</sup>

**Context:** Announced in February 2021, IDB Invest provided a \$125 million blended finance package to ENGIE Energía Chile, which included a reduced interest rate on the \$15 million concessional loan provided by Clean Technology Fund (CTF). Proceeds were used to develop a 162 MW wind farm, which will enable the early retirement of two ~135 MW CFPP units.

#### **Benefits / application of structure:**

- While this pilot loan facility only brought the closure forward by 18 months, the reduced interest rate structure illustrates a mechanism to monetize the value of the avoided emissions in early coal retirement and establish a minimum price in the absence of a carbon market.
- In the event a carbon market is established prior to the loan maturity date that results in higher value of the avoided emissions, CTF and ENGIE will share in the upside.

#### **Enabling conditions:**

- Chile's government policy and commitment to retire 65% of CFPPs by 2025 and decommission all CFPPs by 2040.
- The government conducted roundtable discussions and stakeholder engagement, reaching voluntary agreements with four of the biggest generation companies in the country.
- Avoided carbon emissions are measurable and verifiable.

### **Carbon credits to offset Singapore's carbon tax**<sup>287</sup>

**Context:** Singapore introduced a carbon tax in 2019 that applies to industrial facilities that emit more than 25,000 tonnes of GHG per year. In 2022, Singapore announced that taxable facilities will be allowed to use eligible international carbon credits (ICC) to offset up to 5% of their taxable emissions, increasing local demand for carbon credits. Details of the framework's eligibility criteria were released in October 2023.

#### **Benefits / application of structure:**

- The eligibility criteria require ICCs to represent emissions reductions or removals that must have occurred between 1 January 2021 and 31 December 2030 to comply with Article 6 of the Paris Agreement.
- The ICCs must adhere to seven principles to demonstrate high environmental integrity: not double-counted, additional, real, quantified and verified, permanent, no net harm, and no leakage.
- The National Environment Agency (NEA), Singapore's carbon tax administrator, will release more details by the end of 2023 on the processes and list of eligible host countries, carbon credit programs, and methodologies that meet the eligibility criteria.

<sup>286</sup> World Economic Forum. [Coal to Renewables Toolkit: Carbon Reduction Bonus](#). IDB Invest. [IDB Invest and ENGIE Chile debut the world's first pilot project to monetize the cost of decarbonization](#), 2021.

<sup>287</sup> National Environment Agency. [Carbon Tax](#), 2023; National Environment Agency. [Singapore Sets Out Eligibility Criteria For International Carbon Credits Under The Carbon Tax Regime](#), 2023.

**Figure 27: Life cycle of ICCs**

Source: NEA (2023)

**Enabling conditions:**

- An International Advisory Panel for Carbon Credits was set up to advise the Singapore government on policies relating to carbon credits.
- The NEA is working on a national ICC registry and collaborating with partners to release a public digital dashboard on carbon credits issued across international registries to increase transparency and minimize double counting risk.
- Singapore is partnering with carbon credit programs to improve the carbon services ecosystem and expanding international partnerships in the global carbon market to create new sources of eligible ICCs.

## Facilitation by sub-national government and stakeholder engagement

### Ontario's coal transition journey<sup>288</sup>

**Context:** In 2003, the government of Ontario became the first region in North America to commit to phasing out coal. When legislation passed in 2007, the province had four publicly owned CFPPs, totaling 6.4 GW and employing about 770 workers. The original proposal to decommission these plants would have resulted in securing replacement energy (such as hydroelectric or nuclear) from other communities and losing direct and indirect jobs. Officials campaigned to have their generating units

converted to RE, avoiding major transition impacts to vulnerable communities.

### Benefits / application of structure:

- Ontario used a phased approach, reducing capacity in stages between 2005 and 2014 to maintain system reliability and operational efficiency.
- The site of the largest CFPP, Nanticoke, was converted into a solar farm, while two were converted to biomass (one was subsequently closed due to high costs; the other was used for peaking).

**Figure 28: Timing of coal-fired plant closures in Ontario, 2003-2014**

Capacity (MW)	2003	2005	2010	2011	2012	2013	2014
Lakeview	1,150	-	-	-	-	-	-
Nanticoke	3,940	3,940	2,960	1,980	1,980	-	-
Lambton	1,980	1,980	1,010	1,010	1,010	-	-
Thunder Bay	306	306	306	306	306	306	(April)
Atikokan	211	211	211	211	-	-	-
<b>Total</b>	<b>7,587</b>	<b>6,437</b>	<b>4,487</b>	<b>3,507</b>	<b>3,296</b>	<b>306</b>	<b>0</b>

Source: Ontario provincial government (2023), The end of coal

### Enabling conditions:

- The provincial government and the publicly owned utility, Ontario Power Generation (OPG), listened to stakeholder feedback and assessed local opportunities to maintain employment and provide baseload power and grid security.
- Phaseout was a shared effort by the provincial government, OPG (the largest power generator), and the Independent Electricity System Operator, Ontario's power system coordinator and integrator.
- Transition involved the use of conservation policies and innovative market instruments, such as demand response auctions.

288 IEA. [Phasing Out Unabated Coal: Current status and three case studies](#), 2021; WRI. [Ontario, Canada: Reorienting Local Economies by Converting the Atikokan and Thunder Bay Coal-Fired Generating Stations](#), 2021; Ontario. [The End of Coal](#), 2023.

**Poland's coal transition in Silesia<sup>289</sup>**

**Context:** Coal production and employment in Silesia, a region in the south of Poland, gradually declined over the last three decades due to weak economic performance, accumulating liabilities, and lack of competitiveness. This prompted the government to initiate sectoral policy reforms that downsized the workforce, closed unprofitable mines, and prolonged some operations. Meanwhile, CFPPs struggled to stay afloat due to increasing carbon prices in the European Union. Efforts financed by European funds to stimulate wider regional development in Silesia helped mitigate the major social and economic effects of coal's continuing decline. In 2021, a final plan was made to manage the phaseout of coal mines and power plants and generate job opportunities in new sectors.

**Benefits / application of structure:**

- Polish government policies and measures can be broadly categorized into: 1) those preventing the closure of other mines and mitigating the consequences from closed mines; and 2) those focused on economic diversification and developing alternative jobs.
- Instruments to support laid-off miners included financial support policies (i.e., severance pay, pre-pension leave payments) and reassignment to existing operating mines. The miner reassignment policies were more effective in gradually managing the mine closing process.

**Figure 29: Select policy instrument types used to transition Silesia's coal sector<sup>290</sup>**

	<b>Instrument type</b>	<b>Examples from Silesia</b>
<b>Sectoral policies focused on mines</b>	Subsidies delaying closures of unprofitable coal assets	Social Contract of 2021; NABE; mining sector bailouts before accession to EU
	Subsidies for mining closure covering one-time costs	Mine Restructuring Company (SRK); Treasury takeover of mining companies' liabilities for pensioners
<b>Sectoral policies focused on miners</b>	Severance payments and early retirements	Implemented in every restructuring program since 1990s
<b>Development policies: cross-cutting instruments</b>	Public sector investments and private sector support; human capital investments and capacity-building instruments	Regional Operational Programs; Network of Regional Specialist Observatories in Entrepreneurial Discovery Process
<b>Development policies focused on transition</b>	Subsidies for hiring former miners, and for miners to start new companies or search for jobs	PHARE INICJATYWA
	Investment funds targeted at areas affected by transition	PHARE INICJATYWA, Program for Alleviating Effects of Employment Restructuring in Coal Mining Sector, Just Transition Fund
	Special economic zones in areas affected by transition	Katowice Special Economic Zone

289 Resources for the Future. [Just Transition in Poland: A Review of Public Policies to Assist Polish Coal Communities in Transition](#), 2022.

290 NABE: Acronym for the state-run National Energy Security Agency (Narodowa Agencja Bezpieczeństwa Energetycznego). PHARE: Acronym for the EU program Poland and Hungary: Assistance for Restructuring Economies, initiated in 1989. Its application in Silesia included two "Initiatives" (Inicjatywy) for worker retraining.

To restructure the power industry, the government established a state-run entity to acquire unprofitable CFPPs from three state-owned companies, which will allow the state-owned companies to access financing for greener investments.

**Enabling conditions:**

- The energy transition was driven by a changing economic and political landscape rather than climate targets, and policies that were initially reactive transformed ultimately into proactive measures with social, economic, and environmental objectives in mind.
- Silesia largely benefited from the industrialization and nationwide growth that came with Poland's entry into the EU, which entailed an influx of funds to the region.
- Silesia created new institutions to unlock access to financing and facilitate the design and implementation of development strategies.
- Several institutions related to both the EU and national policy frameworks played a role in spurring regional economic growth, including the Katowice Special Economic Zone that provides preferential treatments for businesses, and regional agencies for enterprise development that support small to medium enterprises.

## Part 6: Next steps

The release of this Final Report marks the completion of the first phase of guidance on Financing the Managed Phaseout of CFPPs in APAC. GFANZ offers recommendations to empower net-zero committed private financial institutions to provide financing in support of accelerated phaseout plans. In doing so, this guidance outlines expectations for relevant stakeholders, such as CFPP owners / operators, and supports financial institutions in implementing their commitments and delivering real-economy emissions reductions.

MPO transactions globally and in the region are nascent, which means the next phase of pursuing pilot transactions is crucial. While considerations put forth in this guidance might provide financial institutions with confidence in addressing leakage risk and moral hazard and optimizing 'meaningful' outcomes, there is a risk of paralysis by perfection. Without plans and projects that demonstrate and test the concept of MPO, it will be difficult to make progress. Conducting **pilot projects** can provide powerful practical applications of the MPO approach in net-zero transition-aligned finance, by bringing out key political, technical, financial, environmental, and social issues in a context of uncertainty.

The success of MPO plans and projects will be aided if:

- national authorities set out **transition plans for their power systems**;
- financial authorities provide **supervisory expectations** on credible transition planning in a manner that supports financing the transition of high-emitting sectors. For example, recognizing the short-term challenges (e.g., spike in financed emissions) that can arise from transitioning finance;
- financial institutions review their **coal power policies** to allow for credible participation in MPOs as one of their financing strategies;
- **country platforms** incorporate MPO for coal power to catalyze private finance alongside public finance sources to support climate objectives.

In parallel, the financing of clean energy and enabling projects can drive down the cost of generating renewable energy power. A significant scaling of clean power and shift away from coal power generation will support achievement of the IEA NZE Scenario, which calls for a 55% cut by 2030 and full phaseout of unabated coal in power generation by 2040. Regional cooperation and integration in other areas (such as cross-border trade of electricity from renewables) can also assist in reducing coal power dependence and improving grid stability / flexibility.

There are numerous areas of future work required to mobilize and scale high-impact coal MPO projects. This path will require collaboration across stakeholders – regional and global, public and private. Consistency across markets in climate policy, power system transition planning, and periodic progress reporting allows for critiquing and sharing of best practices, case studies, and lessons learned, including in conducting MPO transactions.

The formation of an **independent governing body or standard setter** may be explored as well; the main role would be to assess the eligibility and credibility of MPO transactions and help endorse and safeguard the integrity of coal phaseout. The governing body could have representation from across key stakeholder groups, including subject matter experts, financial practitioners, policymakers, representatives from local communities and labor unions, and other advisors.

The development of **tools to identify assets relevant for MPO** and **measuring impact** will also be key for scaling MPO transactions. Portal listings of available and eligible projects can support collaboration among financial institutions, MDBs, and other stakeholders, and national / company-level dashboards bringing transparency to coal-related disclosures can help identify specific opportunities. MPO transactions emerging out of initiatives such as JETPs or ADB's ETM can encourage wider financial institution participation – enabled by wide dissemination and socialization of this guidance with plant owners / operators, governments, and civil society / NGOs.

Furthermore, legal, central bank, ICMA and technical accounting bodies need to converge and publish **templates, standards, and guidelines** for further commentary and consultation. Compliance verification regimes can also reduce due diligence burden and costs associated with MPO transactions.

In time, it may be useful to update this guidance based on developments including completed transactions, with the hopes of creating a repeatable model for scaling up the accelerated phaseout of CFPPs. GFANZ supports the development of guidance around market-specific recommendations to account for diverging market development levels, ownership structures, regulations, energy commitments and transition plans. Such guidance should complement emerging academic and financial institution research.

# FAQ

## How does this report build on the GFANZ previous guidance on Real Economy Net Zero Transition Plans? How can financial institutions apply this guidance to financing managed phaseout (MPO) of coal?

The GFANZ report (September 2022) "[Expectations for Real Economy Transition Plans](#)" outlines components of transition plans that financial institutions can look for from real economy companies to inform their allocation of capital and services, while also serving as guidance for real economy players when building and disclosing progress against their transition plans.

As part of their broader net-zero transition planning, it is key for coal asset owners / operators to have clear commitments within their transition plans around the early retirement of plants on a science-based timeframe. This report's proposed three-step approach outlines 10 recommendations financial institutions can apply to assess the five transition plan themes of an entity-produced coal phaseout plan. The approach also provides further clarity to asset owners / operators on possible conditions of receiving MPO financing.

## Why is the scope of this report limited to only MPO, and how does GFANZ view alternative coal phasedown strategies?

GFANZ [guidance on net zero transition planning \(NZTP\)](#) sets out four key financing strategies to finance the transition to net zero: The strategies are:

- **Climate solutions:** Financing or enabling entities and activities that develop and scale climate solutions.
- **Aligned:** Financing or enabling entities that are already aligned to a 1.5 degrees C pathway.
- **Aligning:** Financing or enabling entities committed to transitioning in line with 1.5 degrees C-aligned pathways.
- **Managed phaseout (MPO):** Financing or enabling the accelerated managed phaseout (e.g., via early retirement) of high-emitting physical assets.

The broader transition to net zero does not depend solely on any one of these strategies, but on a combination of all.

This report focuses on MPO strategies for the early retirement of coal-fired power plants in APAC, and recognizes that the need to rapidly scale clean power should be considered in tandem with coal phaseout strategies.

Other coal phasedown strategies exist, such as retrofitting to allow for flexible operations of a CFPP, energy efficiency or carbon capture measures, or repurposing to co-fire with low-carbon fuels. However, these alternative approaches may be considered under the 'Aligning' to 1.5 degrees C pathways financing strategy, and are not the focus of this report.

That said, early and significant reductions in coal-related emissions are part of every credible pathway that avoids severe impacts from climate change. All efforts should be made to achieve emissions reductions as early as possible, and investments should be pursued with necessary safeguards in place (e.g., no carbon lock-in). See **Box 6** for an example of criteria for assessing suitability of technologies for transition finance. Other phasedown strategies, such as retrofitting, in the absence of phaseout would need to stand on its own merits and would need to consider that many international financial institutions are prohibited or refraining from investments that would extend plant life.

### **Why does the report not address recommendations for financing the managed phaseout of coal mining and suppliers?**

There are different dynamics and considerations when trying to address demand for coal versus the supply of coal. This report focuses on the demand side, where coal-fired power generation is a user of coal. Coal power is also easily substitutable by mature renewable power technologies.

### **How can financial institutions use recommendations on government-level considerations, given that few APAC jurisdictions have made commitments such as ‘no new coal’ or coal phaseout dates today?**

This report proposes ten recommendations financial institutions can apply when setting expectations for an entity-produced coal phaseout plan, which are organized into a three-step approach:

- **Credibility:** ensuring credibility of relevant energy transition and coal phaseout commitments and plans;
- **Impact:** optimizing ‘meaningful’ outcomes across climate impact, financial viability and socio-economic considerations; and
- **Accountability:** achieving transparency and accountability for coal phaseout plans in line with the [GFANZ NZTP framework](#).

Within Step A, while government climate commitments such as ‘no new coal’ or coal phaseout dates can give financial institutions greater confidence in the credibility and likely success of a coal phaseout plan, these should be assessed alongside interdependent entity-level and asset-level considerations. Specifically, more detailed or stronger plans at one level may give comfort around the need for fewer requirements at other levels.

### **What can financial institutions and other stakeholders expect from GFANZ guidance in terms of minimum qualifying thresholds on the eligibility of coal phaseout plans for financing?**

This report offers voluntary guidance for financial institutions regarding the financing of MPO of CFPPs, and is intended to serve as a voluntary reference for other public and private sector stakeholders. As such, this report does not prescribe a specific course of action but offers a principles-based approach, which we expect will evolve as lessons are learned and energy transitions, public policy, and other factors such as economics and technology develop. This guidance does, however, draw on other key coal phaseout guidance and frameworks, and notes key reference material with additional information on possible voluntary goals and metrics that could inform assessments of the credibility and impact of coal phaseout plans. It is the role of others, such as taxonomies and standard setters, to set specific thresholds on various parameters. GFANZ calls on G20 standard setters to accelerate work in building a common framework for MPO, with specific thresholds for an appropriate level of ambition, as part of a wider articulation of a globally applicable approach to transition finance.

### How does this guidance align with international taxonomies?

GFANZ welcomes the steps taken by bodies such as the ASEAN Taxonomy Board (ATB) and the Green Finance Industry Taskforce (GFIT) in developing sustainable finance taxonomies, including for the early phaseout of CFPPs. This report builds on recent work and advances tools and frameworks, referencing criteria put forth by ASEAN Taxonomy's Green and Amber tiers and the Singapore Asia Taxonomy's hybrid approach for coal power phaseout.

While finance plays an essential role in achieving net zero, it cannot substitute for government policy and certain responsibilities cannot be shifted to the financial sector. GFANZ recognizes the need for

other actors to lead or contribute to this effort, such as through the development of sustainable finance taxonomies and / or by setting policies and strategies.

Although these taxonomies have begun to direct the market, GFANZ calls on G20 standard setters to accelerate work in building a common framework for MPO, with specific thresholds for an appropriate level of ambition, as part of a wider articulation of a globally applicable approach to transition finance. The GFANZ work on transition planning is intended to assist policymakers, regulators, and standard-setters as they produce rules and guidance around MPO, so that finance can flow to support the real economy transition and thus reduce economic and financial sector risks.

### What is the difference between BloombergNEF and IEA climate scenarios referenced in this report?

Organization	Outlook	Scenario	Description
<b>BNEF</b>	New Energy Outlook 2022	Net Zero Scenario	The Net Zero Scenario (NZS) is an economics-led pathway anchored in real-world sector and country transitions that achieves net-zero emissions by 2050 and limits the global mean temperature rise above pre-industrial levels to 1.77C. For emissions reductions, it deploys existing, cost-competitive solutions, such as wind and solar and electrification, as well as emerging low-carbon technologies, including carbon capture and storage (CCS), hydrogen and new nuclear. The scenario assumes some additional efficiency gains and a small amount of carbon removal for the hardest-to-abate emissions. It does not reflect countries/ climate pledges.
<b>IEA</b>	World Energy Outlook 2022	Net Zero Emissions by 2050	The Net Zero Emissions by 2050 (NZE) scenario aims to reach net-zero emissions from the energy sector by 2050 based on the deployment of a wide portfolio of clean energy technologies. Decisions about deployment are driven by costs, technology maturity, market conditions and policy preferences.

### Does GFANZ view liquefied natural gas (LNG) as a transitional fossil fuel?

Based on analysis by the IEA and other bodies, most net-zero pathways will involve some limited and targeted investment in fossil fuels, in concert with a massive ramp-up in clean energy investment. There may also be value in shifting to less carbon-intensive sources and reducing scope 1 emissions such as methane leakage. At the same time, given the constraints of the carbon budget, oil and gas investments must stay within clearly defined guardrails.

Oil and gas investments can (but not necessarily will) be transition-aligned only if they incorporate optimal methane and other greenhouse gas emissions controls, have operating lifetimes consistent with net-zero timetables, and provide either energy security benefits or a combination of lower-than-market production costs and emission intensities. Investments which do not adhere to these guardrails will, as the global economy decarbonizes, either become stranded or exhaust the world's limited carbon budget.

