





WORKING PAPER:

GUIDELINES FOR FINANCING A CREDIBLE COAL TRANSITION

A FRAMEWORK FOR ASSESSING THE CLIMATE AND SOCIAL OUTCOMES OF COAL TRANSITION MECHANISMS

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Authors:

Climate Bonds Initiative Sean Kidney Zofia Wetmańska **Climate Policy Initiative** Barbara Buchner Jonathan First Vivek Sen Vikram Widge

RMI Koben Calhoun Tyeler Matsuo Chiagozie Obuekwe Emma Slater Uday Varadarajan

Authors listed alphabetically by organization and name.

Contacts:

Tyeler Matsuo, **tmatsuo@rmi.org** Koben Calhoun, **kcalhoun@rmi.org** Zofia Wetmańska, **zofia.wetmanska@climatebonds.net** Barbara Buchner, **barbara.buchner@cpiglobal.org** Vikram Widge, **vikram.widge@cpiglobal.org**

About Climate Bonds Initiative

Climate Bonds is an international organization working to mobilize global capital for climate action. Climate Bonds promotes investment in projects and assets needed for a rapid transition to a low-carbon and climateresilience economy. Its mission is to help drive down the cost of capital for large-scale climate and infrastructure projects and support governments seeking increased access to capital markets to meet climate and greenhouse gas (GHG) emission reduction goals.

About Climate Policy Initiative

CPI is an analysis and advisory organization with deep expertise in finance and policy. Our mission is to help governments, businesses, and financial institutions drive economic growth while addressing climate change. CPI has six offices around the world in Brazil, India, Indonesia, the United Kingdom, and the United States.

About RMI

RMI is an independent nonprofit founded in 1982 that transforms global energy systems through market-driven solutions to align with a 1.5°C future and secure a clean, prosperous, zero-carbon future for all. We work in the world's most critical geographies and engage businesses, policymakers, communities, and NGOs to identify and scale energy system interventions that will cut greenhouse gas emissions at least 50 percent by 2030. RMI has offices in Basalt and Boulder, Colorado; New York City; Oakland, California; Washington, D.C.; and Beijing.

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1. Introduction

This working paper provides a framework for assessing the climate and social credibility of financial transactions that aim to accelerate a managed phaseout of coal-fired power plants globally (or coal transition mechanism [CTM] transactions). It proposes a set of initial guidelines to help funders, financial institutions, coal plant owners, and the stakeholders to whom they are accountable assess key questions, including whether a CTM transaction:

- Results in real, demonstrable emissions savings
- Enables a broader coal-to-clean transition in support of 1.5°C climate goals
- Mitigates major risks to coal workers and communities

These guidelines aim to be pragmatic, setting a framework to largely mitigate risks, demonstrate positive climate outcomes, and drive transparency needed to inform decision-making. They focus on when and where CTM financing is credible, without delving into how transactions would be structured. We could envision two uses of these guidelines:

- 1. As a tool to assess and demonstrate the credibility of specific transactions. For example, funders, financial institutions, and coal plant owners could use these guidelines to support their engagement on CTM transactions informing negotiations or the design of CTMs or to communicate how specific transactions help accelerate a just energy transition.
- 2. As the foundation for the development of more detailed methodologies and standards. This could include future certification of CTM transactions, inclusion of CTMs in sustainable finance taxonomies or principles,ⁱ methodologies for CTMs to generate carbon offsets, or to support financial institution reporting on their involvement in CTM transactions (e.g., in financial institution transition plans or climate-related reporting).ⁱⁱ Although many of these applications will require additional specificity or adaptation of the guidelines, the guidelines can provide a framework for working through key issues future standards would need to address.

Climate Bonds Initiative, Climate Policy Initiative, and RMI developed these guidelines through a consultative process and expect them to further evolve with both CTM experience and stakeholder needs. Through conversations with experts and stakeholders from public, private, and civil society institutions, we identified the main areas where clearer guidance is needed to mitigate risks and advance the use of CTMs (see **Exhibit 1**).^{III} We then iterated on the type of guideline that could address the identified issues. The guidelines proposed in this working paper present one approach for addressing these challenges. Rather than propose a gold standard for CTMs, we have sought to develop consensus on an initial framework to provide social license, clarity, and environmental integrity for coal plant owners, funders, and other stakeholders to make near-term progress on CTMs. By providing the space for deals to move forward, we hope to enable the necessary learning that can inform future CTM standards and frameworks.

¹ Including jurisdiction-level sustainable finance taxonomies or public finance principles, such as the Equator Principles or International Financial Corporation Performance Standards, among others.

ⁱⁱ Additional guidance on metrics for financial institutions to report their involvement in CTM transactions could help address the challenge that a CTM could increase a financial institution's financed emissions in the short term, despite contributing to real economy decarbonization.

^{III} This included consultations with governments, public and private financial institutions, and nongovernmental organizations across Organisation for Economic Co-operation and Development (OECD) and non-OECD countries.

The CTM guidelines are organized into four stage gates, with specific recommendations under each. Each of the stage gates addresses a key issue, including (1) the need and value of finance in enabling a coal transition; (2) positive climate impact in support of 1.5°C temperature goals; (3) support for a just transition from coal to clean energy; and (4) transparency and accountability to nonfinancial outcomes.

As collective experience with CTMs grows, we expect the guidelines to better calibrate the balance between stringency and pragmatism. For many of the identified challenges, we have contextualized our recommended guidelines within a spectrum of ambition (see **Exhibit 1**). Many of the recommendations represent a minimum bar for credibility and climate alignment, which may be increased over time. We approached this work with a view that enabling positive transactions can go a long way in creating the necessary proof points and demonstrating that capital can be mobilized for the coal transition. As these proof points are established, many of the guidelines will need to ratchet up their ambition to support achievement of 1.5°C temperature goals. To that end, we have identified several areas for future work.

Exhibit 1

Framework and Guidelines to Mitigate Risks and Support the Credibility of CTM Transactions





STAGE GATE 3

	Just transition	•	•	•	
•	The CTM supports a just and equitable coal-to-clean transition	No just transition provisions	Asset-level just transition plan focused on social and environmental protection	Entity-level just transition plans	Regional or national-level just transition plans with socioeconomic provisions
Does the transaction provide transparency and accountability to outcomes?					

No public

reporting

Reporting and governance The CTM provides

transparency on its impacts and governance to the public Public reporting on role of finance, expected climate impact, description of governance

Full public reporting against guidelines

2. Managing the reputational risks of CTMs

Phasing out unabated coal-fired power is one of the most important levers to decarbonizing the economy. Already, leaders across the public and private sectors are recognizing the need to turn off the tap and halt the construction of new coal-fired power stations, leading to a significant slowing of the coal pipeline.¹

However, to limit warming to 1.5°C and avoid the most severe impacts of climate change, we must also urgently manage the phaseout of existing coal power plants. Recent commitments and action — from government pledges, utility commitments, and financial institution engagement on managed phaseout — has signaled strong momentum to phase out coal globally.^{iv2} Last year's Glasgow Climate Pact further underscored this momentum, marking the first time "phasing down" unabated coal was included in an international climate deal.³ Owners, operators, investors, and public entities setting policy and regulations are increasingly expected to build on these commitments to set clear Paris Agreement–aligned transition plans.

CTMs, or financial mechanisms that support an accelerated, managed transition from coal to clean energy (see Box 1), can be critical tools for turning coal phaseout commitments into action. Though the costs of renewables are falling rapidly, many coal-fired power plants remain profitable around the world. An estimated 93 percent of coal plants operate in markets where regulation or contractual structures allow the costs of coal to be passed on to ratepayers, taxpayers, or other public stakeholders — creating relative certainty of returns for coal plant owners.⁴ In other markets, new renewables have yet to undercut the costs of existing coal. CTMs, alongside policy, can help enable a managed transition of such coal plants: winding down obligations, supporting regulatory and financial stability by mitigating value destruction, and protecting communities and workers from negative impacts of an accelerated coal transition.

CTMs are garnering significant interest worldwide. In the United States, ratepayer-backed bond securitization has enabled regulated utilities to retire and replace uneconomic coal with cleaner, cheaper energy. ⁵ In emerging markets, major coal economies like South Africa and Indonesia are negotiating blended finance deals to support a managed transition from coal to clean energy. Meanwhile, multilateral development banks are laying the groundwork to roll out comprehensive coal transition programs, such as the Asian Development Bank's Energy Transition Mechanism (ETM) or the Climate Investment Funds' (CIF's) Accelerating Coal Transition (ACT) Investment Program. Private-sector coal plant owners and financial institutions have also begun piloting transactions, with ACEN Corporation in the Philippines recently reaching financial close on a deal to accelerate the retirement of its remaining coal plant.⁶

Although CTMs are gaining momentum, they also carry key risks that could undermine their ability to deliver on their intended outcomes. These risks, if not managed, could pose major reputational challenges and barriers to the mobilization of capital for CTMs. To support the near-term progress on CTM deals, these guidelines provide a framework to address:

• **Risks that the CTM transaction does not deliver positive climate outcomes,** including the risk that the transaction does not result in real emissions savings or that it undermines environmental integrity, including the achievement of long-term climate goals (e.g., by encouraging further investment in coal or replacement of retired coal with new fossil fuels)

^{iv} Following commitments at the 2021 United Nations Climate Change Conference (COP26), over 87 percent of the global coal fleet was covered by a climate commitment, such as a commitment to coal phaseout or net-zero emissions, based on an RMI analysis of climate commitments using Global Energy Monitor data.

- Social, environmental, and economic risks to coal workers, communities, and regional governments if a just transition that helps mitigate negative impacts is not prioritized, planned, and implemented effectively
- **Reputational risks attached to the optics of providing financing to coal plant owners**, even if this financing helps support decarbonization in line with broader 1.5°C goals

Box 1: A note on definitions for financing a coal transition

Coal transition mechanisms (CTMs) refer to the broad types of financial mechanisms that aim to accelerate a managed transition of coal-fired power plants that have remaining fair value to their owners.^v Although other complementary activities, including investments in clean energy resources or a just transition, are likely required for a managed and just coal transition, these activities do not need to be financed by the CTM directly.^{vi7} In this working paper, CTMs refer to mechanisms that involve participation from the financial sector (i.e., CTMs do not include policy mechanisms that solely disburse taxpayer funds). Examples of CTMs include ratepayer-backed bond securitization or managed transition vehicles such as an ETM.

CTM transactions are the specific deals to transition an identified coal unit or portfolio of units. Public Service Company of New Mexico's (PNM's) issuance of a ratepayer-backed bond to retire units 1 and 4 of its San Juan Generating Station (SJGS) is an example of a ratepayer-backed bond securitization transaction (see case study at the end of this working paper for details).

Coal phaseout refers to the phaseout of unabated coal-fired power generation, through retirement or complete retrofitting of plants to produce clean generation.

Coal phasedown refers to strategies to reduce emissions from existing coal plants through ramping down utilization (e.g., repurposing) or retrofitting to reduce emissions (e.g., co-firing), but still entails unabated coal combustion. Coal phasedown strategies can support the end goal of phasing out unabated coal power in line with climate targets, for example by supporting the integration of renewable generation.

Coal transition refers to the collective process of managing the coal-to-clean transition and ultimate phaseout of unabated coal in line with 1.5°C goals. It can include both coal phaseout and coal phasedown strategies for individual assets, which collectively enable a managed phaseout of unabated coal-fired power generation.

^v The scope of this working paper is limited to financing mechanisms that accelerate the transition of coal for power generation. It does not include coal use for heat or combined heat and power applications.

^{vi} For example, just transition investments may come from other sources or financing tools. CIF's ACT Indonesia Country Investment Plan gives an example of how the activities and their financing may be considered in their Indicative Financing Plan.

3. A framework and guidelines for evaluating the credibility of CTM transactions

The CTM guidelines are organized into four stage gates that address (see **Exhibit 1**):

- 1. **Coal plant eligibility:** Is it credible to provide transition finance for the coal plant?
- 2. **Coal transition pathways:** Does the coal transition pathway proposed by the transaction support 1.5°C goals?
- 3. Social protection: Does the transaction include a plan and provisions to support a just transition?
- 4. Accountability: Does the transaction provide transparency and accountability to outcomes?

The following sections describe each stage gate in more detail — putting forward recommended guidelines within each — before providing several illustrative case studies to show how the guidelines could apply to different CTM types and market structures.

3.1 Stage gate 1: Is it credible to provide transition finance for the coal plant?

The first stage gate aims to identify when finance would be an appropriate tool to support a coal plant transition. It addresses major challenges related to the provision of finance to support a coal transition, including moral hazard, optics challenges of providing financing to coal plant owners, and non-additionality. Though the guidelines are focused on the plant level, they could apply to a portfolio of coal plants in a transaction. For example, they could help funders assess whether finance would credibly support the transition of the whole portfolio of coal plants put forward by a coal plant owner — or just a subset of those plants.

Notably, the guidelines do not provide a framework for prioritizing or sequencing the transition of a fleet of coalfired power plants. This prioritization will be highly context-dependent and likely managed by governments, system operators, and regulators (see **Box 2**). An area for future expansion of the guidelines could be to assess CTM transactions against country-specific coal transition plans.

Box 2: Planning, prioritizing, and sequencing the transition of a coal fleet

The guidelines provided in this working paper offer minimum requirements for a coal plant to receive transition finance. Our aim is to ensure that the guidelines do not exclude any plants that would give clear, evidenced climate benefits from applying a CTM.

Several other factors will play an integral part in the design and negotiations of CTMs, their specific transaction structure and price, and the sequencing or prioritization of projects. In their prefeasibility study for the application of the ADB's ETM, Carbon Trust, Asia Group Advisors, and Climate Smart Ventures exemplify one approach to prioritize the transition of coal units across Indonesia, Vietnam, and the Philippines. In their multicriteria approach, they consider energy security, cost, and carbon impacts of plant retirements.⁸ Similarly, the University of Maryland's Center for Global Sustainability and the Institute for Essential Services Reform deep dive into Indonesia's coal fleet to consider not only emissions reductions but also the cost and social benefits of retirement on air quality, public health, and water security against the costs of stranded assets, decommissioning, employment transition, and state coal revenue losses.⁹ Carbon Tracker, as part of its support for the Climate Action 100+ Net Zero Company Benchmark, has also created an approach for developing coal phaseout schedules that agree with regional climate-aligned power demand schedules, based on factors such as a plant's economics, age, technology, and efficiency.¹⁰ TransitionZero has also created an open-source Coal Asset Transition database tool, which considers data for 211 coal units in Indonesia against selected Sustainable Development Goals.¹¹

Guideline 1



Challenge: The provision of finance to support the transition of existing coal plants could lead to **moral hazard**, distorting investment decisions in new coal plants by creating a potential expectation that financing from a CTM could be available in the future.



Guideline 1: 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 (see **Exhibit 2**), though would increasingly restrict the eligibility for future coal plants.^{vii}



Exhibit 2 Estimated Eligible Coal Capacity in OECD and Non-OECD Countries

The Glasgow Climate Pact, agreed by United Nations Framework Convention on Climate Change parties in November 2021 at the United Nations Climate Change Conference (COP26), 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 role in a Paris Agreement–aligned future. Additionally, COP26 provided a venue for several announcements on coal transition financing programs, including the Just Energy Transition Partnership (JETP), ACT Investment Program, and ETM. The establishment of these programs created an expectation that CTMs may be introduced in several markets. Both conditions create an important threshold to mitigate moral hazard.

These guidelines set a threshold based on **financial close** or **final investment decision** for three reasons. First, construction times for thermal plants span an average of four years but could be much longer for some coal

vⁱⁱ Exhibit 2 assumes plants that started construction after January 2022 reached financial close after December 2021 unless public information provided evidence of an earlier financial close date. This proxy likely overestimates ineligible capacity. This exhibit excludes captive power plants. The exhibit is based on an RMI analysis using Global Energy Monitor data.

plants.¹² In tying eligibility to financial close, rather than commercial operation date, these guidelines recognize both the value sunk in coal plants under construction and the potential liability coal plant owners may face if they abandon development during construction. Second, financial close represents a clear legal milestone, making it less gameable compared with a threshold tied to a specific stage in the construction process (e.g., only allowing eligibility of coal plants that are X percent complete). Third, a threshold tied to financial close would help incentivize countries and utilities to address coal plants in earlier stages of the pipeline that do not yet have significant financial or contractual obligations.

Guideline 2

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Challenge: Financial institutions and funders face **optics challenges of providing financing to coal plant owners,** particularly if coal plant owners are not aligning their businesses, strategies, and investments with a climate-aligned future.



Guideline 2: 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.

Beyond ensuring emissions savings at a transaction level (see stage gate 2 below), the credibility of CTM financing may also depend on a coal plant owner putting in place entity-level climate commitments and transition plans. *At a minimum*, we recommend a CTM only support the transition of coal plants whose owners have a commitment to **no new coal** power plant development or procurement globally, beyond plants that have reached financial close or final investment decision.^{viii} This includes a commitment to not extend the life or increase the capacity of any existing coal-fired power stations.

A no-new-coal commitment would address moral hazard risks at an entity level, as well as the major optics challenges — and potential emissions leakage risks — of utilizing a CTM to support the transition of a coal plant whose owner is actively building new coal power plants. To reduce leakage risks, *at a minimum*, we recommend the boundary of the no-new-coal commitment is transparent and ideally set at the company level (parent versus subsidiary) that encompasses the electricity sector emissions of the parent entity. For example, funders could face reputational challenges if they finance the transition of a coal plant owned by a subsidiary whose parent company is continuing to build coal power plants in other markets.

Although we recommend a no-new-coal commitment is the minimum entity-level commitment that would support credible CTM financing today, entity-level commitments and transition planning are a strong area for future ratcheting of ambition. Financial institutions and funders increasingly expect real economy companies and organizations to set climate-aligned emissions targets and develop transition plans. As these expectations increase, credible target setting and transition planning is likely to influence access to and costs of transition finance and other services. The same is true for CTMs, where transition plans can help validate assumptions of coal transition pathways, demonstrate the alignment of the coal transition pathway with the coal plant owner's strategy, and show a coal plant owner is committed to a low-carbon transition.

Moving forward, we recommend coal plant owners have in place commitments and develop transitions plans as soon as possible and at the latest by 2030 that would minimally include:

viii Abated coal may be considered where abatement technologies have been built into the project design and will deliver emissions intensities aligned with the definition for clean generation (100 grams [g] CO2 equivalent [CO2e] per kilowatt-hour [kWh]).

- 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 forwardlooking coal phaseout plan that supports achievement of that commitment
- Holistic transition planning that supports the achievement of climate targets^{ix}

Guideline 3



Challenge: If funders provide transition finance to coal plants that would have been retired without a CTM, **no additional climate benefit** would result from the transaction, undermining the mechanism's additionality and objectives as a climate finance instrument.



Guideline 3: The fair value of the coal plant is positive at the time of the proposed coal transition.

Although defining additionality could involve assessing the impact of the transaction across several metrics (e.g., impact on supporting a just transition or mitigating energy burden for electricity customers), we recommend at a minimum that climate additionality be shown by demonstrating **the fair value of a coal plant is positive** at the time of the proposed coal transition (see **Exhibit 3** for an overview of several fair value methodologies).[×] Fair value is already reported by many coal plant owners and can capture the key cases where finance could provide value to accelerate a managed coal transition (see **Exhibit 4**).^{×i} Providing financing to plants with negative value also raises the risk that CTMs are perceived as subsidizing the coal industry, creating further optics challenges around transactions.

^{ix} Organizations such as the Glasgow Financial Alliance for Net Zero, Task Force on Climate-Related Financial Disclosures, Climate Bonds Initiative, Climate Policy Initiative, Climate Action 100+, the OECD, and the Assessing Low Carbon Transition Initiative are developing robust frameworks for defining credible transition plans and targets.

^x The International Financial Reporting Standards (IFRS) defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. In effect, it is the market value of a coal asset for an owner based on market and regulatory conditions. Although the fair value approaches proposed here would incorporate both forward-looking and historic data, on their own they would not be able to assess whether an asset previously had a fair value below zero. This static approach could result in situations where, due to decreases in coal demand and prices or through the transfer of fuel supply contracts, CTMs enable previously negative-value plants outside the transaction to achieve a positive fair value.

xi Most power sector utilities and coal plant owners in developed and emerging markets submit regional or international financial reporting to financial regulators using local generally accepted accounting principles or IFRS, which includes an assessment of assets held.

Exhibit 3: Standard approaches to assess fair value based on the International Financial Reporting Standards (IFRS)

Valuation Approach	Benefits, challenges, and risks
The market approach creates a market value of an asset using market information from recent financial transactions of comparable assets, such as prices and price multiples, applied to adjusted earnings. Market information could also come from Reverse Auctions for coal decommissioning (see Box 3).	 Incorporates future expectations from the market into the value of the asset with less subjectivity by the valuer (predominantly only in adjusting earnings figures) There may not be sufficient publicly available market data on recent comparable transactions to support the market value approach for coal assets
The income approach creates a net present value (NPV) by converting revenue and cost assumptions for future cash flows into a single present-discounted amount, incorporating current market expectations	 ✓ If the inputs to the calculation are credible, this can give a highly accurate valuation that incorporates future cash flows discounted to reflect the time value of money and the risk premium associated with the asset. It would also include any expected impairments due to market or regulatory conditions, or any expected benefits due to policies that are likely to remain in effect (e.g., subsidies) ✓ NPV calculations require significant estimation for future revenues and costs and an appropriate discount rate. These are all subjective and therefore can undermine the credibility of the valuation.
The cost approach creates a remaining plant balance of the cost to acquire or construct the asset, or a comparable asset, adjusted/depreciated for obsolescence.	 While this approach can include subjectivity through the choice of costs capitalized and the depreciation approach over the asset lifetime, this subjectivity can be mitigated through a uniform application of IFRS methodology for capitalization and depreciation of assets The remaining plant balance calculation does not incorporate the value of earnings associated with the asset and therefore may not accurately represent the future earnings potential of the asset. It therefore is likely a floor for asset valuation in certain markets.

Measuring the fair value of coal assets can be complex. Fair value assessments often incorporate current and future market and regulatory conditions, which can be subject to volatility and speculation. As a result, fair value assessments can be inherently subjective, and each valuation approach brings specific misvaluation risks. Given the benefits and misvaluation risks of different approaches, the appropriate fair value methodology will depend on market and ownership structures, and the quality and availability of financial reporting data. **Exhibit 4** presents general recommendations on how standard IFRS valuation methodologies may be applied in different

market contexts, but ultimately valuation approaches may be specific to transaction negotiations and assets.^{xii} Price discovery mechanisms such as reverse auctions may also support effective valuation in some contexts but may not be appropriate for certain markets or transaction types (see Box 2).¹³

Box 3: The potential use of reverse auctions to value early retirement of coal plant assets

Reverse auctions are a price discovery mechanism that can support the efficient allocation of finance through CTMs. Auctions help competitively value coal plant assets by incorporating market participants' expectations for future economic value while encouraging competition to push down the acceptable cost of retirement. The auctions allow "sellers" (i.e., coal plant owners) to place bids for the prices at which they are willing to retire their coal plant early, competing over the lowest acceptable prices. The auction may then set a clearing price or clearing capacity (gigawatts [GW]) under which the most competitive prices clear the market and receive CTM financing to enable their decommissioning.

Public bodies have traditionally run reverse auctions, working as a tool that can help allocate the disbursal of public funds. In Germany, the Federal Network Agency (Bundesnetzagentur [BNetzA]) has run four rounds of reverse auctions, clearing almost 9 GW of Germany's coal capacity.¹⁴ Although the auctions are considered successful in setting a market price and accelerating the coal transition, critics argue that the first round of auctions facilitated the closure of modern, cleaner plants, leaving dirtier lignite plants to continue — pointing to the importance of auction design.¹⁵

Reverse auctions may not be well suited to all situations.¹⁶ Successful auctions will depend on:

- **1.** A supportive state and regulatory environment committed to coal transition, ensuring supportive legal and regulatory frameworks for businesses engaged in the tendering processes, effective energy security planning, and sufficient financial resources underpinning the auctions.
- 2. Sufficient market participants to support effective competition; if there are too few coal plant owners in a jurisdiction, it will preclude effective competition in any reverse auction.
- **3. Strong auction design to support long-term phaseout goals** to ensure most coal plant owners are incentivized to seek decommissioning for each specific market and ownership structure (noting the challenges to early retirement caused by long-term power purchase agreements [PPAs] and Fuel Supply Agreements).

xⁱⁱ A market value approach may be appropriate in any market context, but it is unlikely there will be sufficient comparable transactions to enable this approach. As CTMs become more common, this could change.

Exhibit 4: Recommended valuation methods for different electricity market and ownership structures

Type of market and ownership	Where a CTM may add value	Recommended valuation method	Key considerations
Coal plant operating in a wholesale market , where prices and quantities of dispatched power are set in competitive markets.	Coal plants that remain profitable in wholesale markets due to strong economics. CTMs could support the retirement of such coal plants, potentially freeing up grid access for clean	NPV of continued operation based on wholesale dispatch and, if relevant, offtake under any PPA.	NPV calculations, rather than remaining plant balance, will be important to account for any future market demand, supply, and regulatory conditions that could affect plant valuation — particularly given impairments are
Coal plants in competitive	generation.		likely as climate-related risks grow.
fully merchant coal plants, selling and trading electricity on the wholesale market, or could have PPAs that	wholesale markets, coal plants are facing decreasing economic viability due to competition from lower-cost renewable		In a wholesale market, a plant with a negative NPV of future cash flows is unlikely to sustain operation.
would set pricing and offtake conditions for (a portion of) their generation. Plants with a PPA could sell excess generation on the wholes a market	energy, obsolescence and cost recovery challenges, and inconsistent government support. As a result, we expect a decreasing number of coal plants in whetesale markets to		The data needed for an NPV calculation will be significant and complex. However, wholesale competition typically correlates with higher degrees of corporatization of coal
wholesale market.	wholesale markets to be eligible for CTM financing over time.		plant owners and stronger independent regulators. This will likely drive increased transparency and disclosure, with stronger internal and external

financial reporting

processes.

Coal plant selling to a single buyer , without an opportunity to sell excess generation on competitive markets. This would include captive plants that provide electricity to industrial facilities or independent power producers (IPPs) that have a PPA with a single- buyer utility.	Coal plants that have long-term contractual or economic structures that help ensure cost recovery and returns of the coal plant. CTMs could help transition coal plants without undermining the credibility of future contracts (e.g., undermining confidence in PPAs).	NPV of continued operation. In some cases, a financial institution may also ask for disclosure of the PPA termination fee.	The NPV approach would take into account any challenges or impairments that would lead to negative cash flows (e.g., if operating costs or conditions assumed when a PPA was signed have changed). The accuracy of the NPV value would largely depend on the quality of data on costs and operations, as revenues for power plants under a PPA can often be estimated fairly well based on the contract terms. Otherwise, for many coal plants with a PPA, the termination fee likely provides a "floor" price for the fair terminal value of the plant. PPA termination fees often provide recovery of capital costs and repayment of any outstanding asset-level debt.
Coal plant owned by a regulated utility , where regulation ensures an agreed upon return on investment or cost recovery for the plant owner.	Coal plants that are insulated from competition and can pass costs onto ratepayers, taxpayers, or other public stakeholders. CTMs can both support the early retirement of plants in regulated markets and help mitigate the costs of accelerated retirement on ratepayers.	Remaining plant balance, verified by the electricity regulator. In some cases, a financial institution may also ask for disclosure of NPV if a utility is not provided regulated cost recovery and/or a return.	Regulated utilities are provided a regulated return on their investment, providing relative certainty of cost recovery and returns. The undepreciated balance would represent the value that a utility is still eligible to recover plus an agreed upon return. NPV may not be an appropriate valuation method for regulated markets, as some coal plants operate at a loss from a cash flow perspective but may receive additional subsidies or support at an entity level to enable the coal plant owner to

remain solvent.

3.2 Stage gate 2: Does the transaction's proposed coal transition pathway support 1.5°C goals?

A managed phaseout of coal may entail several different plant-level transition pathways, from the direct phaseout of the plant and replacement with clean generation to more complex phasedown pathways. Although many of these transition strategies can support emissions savings and a 1.5°C-aligned trajectory for the power sector, each may carry different climate risks. The guidelines under this stage gate aim to provide sufficient backstops to mitigate these risks while providing flexibility to system operators and regulators to plan a coal transition that supports energy security and economic development objectives (see **Exhibit 5**).





Guideline 4



Challenge: Coal plant owners and funders face increasing expectations to achieve emissions reduction commitments (see guideline 2), and CTM transactions will need to support the end objectives of achieving a 1.5°C future.

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Guideline 4: 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.

These guidelines propose that, at a minimum, CTMs show climate impact through the demonstration of **positive absolute emissions savings** over the expected lifetime of the coal plant compared with a case without a CTM. A simple emissions savings metric aims to avoid perverse outcomes that could arise if coal plant eligibility is further restricted (see **Box 4**). For example, restricting eligibility based on whether emissions savings at a transaction level are "large enough" could ignore other co-benefits that regulators and governments may wish to prioritize, such as just transition, health, or power sector reliability impacts. Future work could explore whether specific emissions savings thresholds would be appropriate to lend further credibility to transactions. However, beyond positive emissions savings, at a minimum we also recommend that a CTM transaction have a **backstopping commitment** to phase out unabated coal combustion at the coal plant by country-specific, coal phaseout timelines. We propose these deadlines would 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 International Energy Agency's (IEA's) Net Zero pathway.¹⁷

The 1.5°C-aligned deadlines may also be derived from other regional- or country-specific pathways that are consistent with science-based pathways.^{xiii} Although we do not require full 1.5°C country-level coal transition planning and commitments for a transaction to move forward, it will be important to avoid possible emissions lock-in that would be incompatible with processes to ratchet up climate ambition to achieve 1.5°C targets. For example, a transaction would not be credible if it proposed to phase out the coal plant by 2060, because it would create risk of nonachievement of global climate goals.

We have not proposed a specific methodology for quantifying emissions savings in these guidelines. Instead, if a transaction can meet these guidelines, it likely can demonstrate qualitatively that it delivers long-term emissions savings and helps avoid the replacement of coal with other baseload fossil fuel generation. However, quantitative emissions savings methodologies are an important area for future work, particularly if CTM transactions will involve results-based carbon finance or generate carbon offsets. 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.^{xiv}

Box 4: Alternate metrics to assess the climate impact of CTMs

Below are other metrics considered through the consultation process. As more work and experience on CTM occurs, there may be a need for additional metrics or thresholds tied to CTM credibility.

Years retired early: A year-based metric may misrepresent climate impact for a few reasons. First, there is a wide variation in the capacity, emissions intensity, and utilization rates of coal-fired power plants. Retiring a large, inefficient, baseload coal plant a few years early may provide a significantly larger climate impact than retiring a smaller plant with low capacity factor 10+ years early. Second, an impact metric focused on years could disadvantage certain coal transition pathways, such as repurposing a coal plant for flexible operation. This pathway is more likely to be pursued in emerging markets with newer coal plants, creating a risk of global inequities in access to coal transition finance. However, a time-based approach may be applied in the future if a country or power sector has developed a coal transition plan that takes into account the factors mentioned (utilization, emissions intensity, etc.), and asset transition plans are assessed against this fleetwide plan.

Setting minimum thresholds for emissions savings: At present, the guidelines require a demonstration of emissions savings greater than zero, without requiring a threshold for how substantial these savings should be. Applying a higher emissions threshold may exclude some transactions that would otherwise deliver environmental, health, social, or power sector co-benefits, which may be a priority to a government or funder. Additionally, applying a single, top-down emissions savings threshold would be difficult given the heterogeneity of the coal fleet and coal transition timelines. An area for future work could be to assess the credibility of coal plant transitions against country or regional asset-level coal transition plans.

xⁱⁱⁱ For example, the University of Maryland and Institute of Essential Services Reform conducted an analysis of Indonesia's coal fleet and found that a 1.5°C-aligned pathway could be achieved by phasing out unabated coal in Indonesia by 2050. ^{xiv} The emissions boundary should not change from the baseline to the CTM case (e.g., a coal plant owner should not change the system boundary to allow it to simply divest from a coal asset).

Cost of abatement hurdle rate: Although abatement cost will be an important metric to track, we have not recommended an abatement cost hurdle rate given the other benefits a coal transition could provide.

Discounting of emissions savings: Discounting could be appropriate, both to account for the uncertainty in future emissions savings and to incentivize greater near-term emissions savings. However, discounting also presents potential intergenerational equity challenges (i.e., prioritizing benefits to today's generation over future generations) and also raises questions about what an appropriate discount rate would be. This could be an area for future exploration, particularly if future emissions impacts will be monetized through results-based finance or carbon finance approaches.

Guideline 5

Challenge: Some coal transition pathways, such as repurposing coal plants for flexibility or cofiring of coal with other fuels, may reduce emissions but still entail unabated coal combustion continuing. These pathways pose a risk of **backsliding** and nonachievement of intended emissions savings.



Guideline 5: The CTM transaction does not extend the expected lifetime for unabated coal combustion.

There are several scenarios for the phasedown — rather than immediate phaseout — of coal, including repurposing coal plants for flexible (rather than baseload) use; partial carbon capture, use, and storage (CCUS); and co-firing with biomass or ammonia. However, many of these options would require additional investment in the coal asset and a risk of continued unabated coal combustion.^{xv} We recommend that a CTM **not extend the expected lifetime for unabated coal combustion** and that it fast-tracks cessation of fossil fuel-based activities of a plant. Exceptions may be considered if the transaction puts in place regulatory or contractual provisions that would effectively remove backsliding risk (e.g., if a PPA contract for flexible operation would contractually limit offtake). Finally, we recommend that investments in co-firing with biomass, ammonia, or retrofitting with CCUS meet sustainable investment guidelines in order to demonstrate their credibility (e.g., that biofuel, among other things, must be sourced from a sustainable feedstock).¹⁸

Guideline 6



Challenge: The generation lost from coal plants that have been phased down or phased out may be replaced with higher-emitting assets across the local generation system, resulting in **emissions leakage.**



Guideline 6: 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.

^{xv} This guideline would not apply if the coal plant was fully retrofitted to burn clean fuels in line with the thresholds set in guideline 6. For example, CCUS that results in emissions below 100 grams of CO2e/kWh would not be subject to this provision.

Mitigating leakage risk through retirement and replacement of coal generation with clean resources

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. We suggest that this replacement could be based on historical dispatch (e.g., real utilization of coal capacity), rather than nameplate capacity, to account for the reality that many coal plants have utilization rates well below their nameplate capacity.

These 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 below thresholds, burning clean fuels).^{xvi} We also recommend coal plant owners and funders demonstrate 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).

In these guidelines, "clean resources" are defined as resources with a **life-cycle emissions intensity of 100 grams (g) CO2 equivalent (CO2e) per kilowatt-hour (kWh) or less**, in line with the European Union (EU) Taxonomy for Sustainable Activities.¹⁹ Although the EU recommended this threshold based on an assessment of the energy resources that would substantially contribute to the bloc's goal of net zero by 2050, we adopt it in these guidelines for several reasons.

First, this approach is increasingly accepted as a threshold within the international financial sector and in other government criteria for sustainable projects. Second, it is technology and fuel agnostic but would effectively prevent the CTM from directly financing the replacement of the coal plant with other fossil-fueled power plants without significant CCUS investment. In today's cost environment, such an investment is unlikely to prove economic. The Intergovernmental Panel on Climate Change estimates the life-cycle emissions from all renewable energy sources range from 6 to 180 g CO2e/kWh, with the median across technologies falling well below 100 g CO2e/kWh. In contrast, life-cycle emissions associated with natural gas with CCUS range from 90 to 370 g CO2e/kWh, with the lower range representing high rates of carbon capture and low upstream methane leakage.

Third, it would limit retrofits based on other fuels to cases with significant levels of co-firing and to fuels with low life-cycle emissions (e.g., upstream emissions from biomass or ammonia production would need to be low). Life-cycle emissions from biopower are wide ranging, from less than –200 g CO2e/kWh to over 750 g CO2e/kWh, depending on the sustainability of the biomass source.20 Where there is a lack of data on the life-cycle, or upstream, emissions of the specific replacement capacity, a benchmark of the highest 10 percent of emitters with that technology would mitigate the risk of underestimating life-cycle emissions.^{xvii}

Mitigating leakage risk though long-term climate commitments and planning

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. For example, a system operator or regulator may prefer to repurpose the plant for flexibility (e.g., to support renewable integration),

^{xvi} Demonstrating direct one-to-one replacement is not practical due to differences in dispatch or provision of other grid services such as ancillary services, but bringing on an equivalent volume of clean resources could provide relative comfort that major emissions leakage issues are managed. The replacement generation need not be developed by the existing coal plant owner but could be done through a partnership with another company. For example, Earthrise Energy has acquired power plants in the United States to transition to clean generation.

x^{vii} This benchmark is consistent with policies such as the EU's Carbon Border Adjustment Mechanism.

dispatch grid resources in the interim (e.g., if the system is over capacity), or mothball the plant before fully decommissioning it (e.g., if energy security is a concern). In these cases, we recommend, at a minimum, a **power-system-level decarbonization commitment**, and in some cases electricity resource plans would be needed to support the credibility of long-term emissions savings. 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.^{xviii}

This could include a demonstration that power sector emissions are decreasing:

- In **wholesale electricity markets**, the existence of a legally binding commitment or law that codifies a commitment to reduce medium- and long-term power system emissions (e.g., Germany's Climate Action Law) 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 (IRP) or equivalent power-sector-level plan that details how the power system will be developed to meet projected electricity demand and climate targets, and a commitment to no new coal development or procurement beyond plants that have reached financial close.

To be credible, these guidelines suggest that any new gas investments proposed in a regulated utility's resource plans would demonstrate that new gas investments are aligned with the utility's climate targets, shown through long-term planning and reasonable cost assumptions.xix We also recommend the resource plan include a credible analysis of alternative options that demonstrate that there is no economically and technically feasible clean energy alternative that meets energy security and access objectives. This would ideally include (1) a demonstration of the services needed on the grid, how natural gas would meet these, and at what capacity factor compared with other resources; (2) an assessment of the cost of system operation with the proposed gas investment, including a sensitivity to higher gas prices, compared with other resources; and (3) an assessment of any new complementary gas infrastructure (e.g., liquified natural gas import facilities, pipelines) that would be required to support the proposed plants, and the necessary power sector demand and resulting capacity factors that would be needed to justify this investment. See **Box 5** for the guidelines' overarching approach to mitigating coal-to-gas switching risks.

Box 5: Mitigating risks of financing coal-to-gas switching through CTMs

These guidelines generally aim to mitigate the risk that a CTM directly supports the replacement of coal-fired power generation with natural gas generation within the transaction itself. Particularly given the upstream emissions of natural gas and the lock-in risk of building out new natural gas infrastructure, supporting new natural gas investment on an energy basis directly through a transition finance instrument like a CTM could pose significant credibility issues.

As a result, the guidelines address natural gas at two levels:

At a *transaction level*, where there is a direct replacement of the coal generation with other energy resources, preventing the replacement of coal with gas on an energy basis by:

• Setting a threshold for the emissions intensity of replacement generation at 100 grams CO2e/kWh on a life-cycle emissions basis. This would include any new investment in greenfield generation or any retrofitting investments to transition a coal plant to a new fuel or energy technology. This technology-

^{xviii} In line with guideline 2, we would recommend a 1.5°C-aligned power-system commitment and plan would be in place by 2030 at the latest.

xix This could include gas plants being retired on a timeline consistent with the entity's climate targets or having credible plans to transition them to net zero. The latter case would be grounded in transparent and reasonable assumptions about the cost of net-zero retrofitting technologies.

neutral threshold would exclude any natural gas that does not have high rates of carbon capture and low upstream emissions.

At a *power system level*, where the coal plant may not be directly replaced by new generation, bringing scrutiny to new gas investments outside of the transaction through a demonstration that:

- New natural gas investments will be aligned with power sector decarbonization goals
- Natural gas is necessary from a power system reliability, energy security, and access standpoint
- Alternative clean resources have been assessed, which would likely rule out new gas investments in many markets based on economics alone

3.3 Stage gate 3: Does the transaction include a plan and provisions to support a just transition?

Beyond climate outcomes, a credible transaction would also ensure social protection for stakeholders negatively affected by a coal transition. Just transition plans can help ensure the coal plant owner, in partnership with governments, community members, and other stakeholders, mitigate critical impacts of the coal plant transition on affected stakeholders.

Guideline 7



Challenge: The transition from coal to clean energy **creates social, environmental, and economic risks,** potentially destroying value for local communities, workers, electricity customers, regional governments, and other stakeholders.



Guideline 7: The coal plant has a just transition plan to mitigate impacts on workers, electricity customers, and the local community.

Without thorough planning and adequate resources, the transition from coal-fired power to clean energy can harm workers and families who depend on fossil fuels for livelihoods and destroy value for local governments, communities, and supply chains.²¹ In contrast, a well-planned transition has the potential to attract investments that support economic growth and diversification, leveraging new opportunities associated with a transition.

A just and equitable transition ideally follows key guiding principles: 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).²²

To confirm that the coal plant transition is "just," it is essential to mitigate key social, environmental, and economic risks and impacts for end consumers of electricity, local communities, and regional governments. In addition, it is imperative to support continuity of livelihood for workers through either pension support or alternative employment (including reskilling, retraining) to maintain the well-being of the local community. It is also important to ensure that women, young people, and other underrepresented or marginalized groups are included in just transition planning, and that they can access training and capacity-building opportunities. These groups can often be particularly vulnerable to negative shifts in economic circumstances and interruptions in access to infrastructure and services.

Coal plant owners, in partnership with other stakeholders, have a major role to play in supporting a just and equitable coal transition. These guidelines focus on applying just transition principles at **the asset level** — where coal plant owners are likely to have greater influence — with a strong focus on protecting workers (direct

and indirect, formal and informal), direct beneficiaries, and local communities from the negative social and environmental impacts of an accelerated coal transition.

This asset-level focus may not capture all the necessary aspects of the just transition, particularly any economic, induced, and/or systemic impacts on broader communities, end consumers, regions, or nations. As a result, they do not indicate an exhaustive list of all actions that would be needed to support a broader just transition in coal regions. Many of these broader impacts will likely need to be also managed by governments and regulators.

The just transition activities in these guidelines do not necessarily need to be financed entirely in the transaction or undertaken directly by the coal plant owner alone. The coal plant owner can and is encouraged to undertake activities in collaboration with governments, nongovernmental organizations (NGOs), civil society, and international development partners. Ensuring coordination, particularly with regional or national governments, in turn can also help minimize the risk of missing any systemic impacts that may occur due to multiple asset closures in a region and support policy-level just transition provisions.^{xx}

Finally, these just transition guidelines build on an existing body of work on just transition expectations for corporations.²³ We recognize that we are both in the early stages of learning about effective just transition planning and implementation, and that there will never be a one-size-fits-all approach. As the Sharm El Sheikh Guidebook for Just Financing released at COP 27 further reveals, the innovative financing mechanisms needed to accelerate a managed coal phase out will take different forms, hence these guidelines will need to be updated as we learn more about CTMs in practice.²⁴ As a result, the recommendations below provide initial guidance on what a credible asset-level just transition plan may include. Unlike previous guidelines, they outline broad features of just transition plans, without suggesting specific standards.

Components of asset-level just transition plans

Provide advance notice of coal plant closure and communicate clear timelines for phaseout: Advance notice is critical to allow sufficient time for planning and engagement, particularly because many just transition investments will be needed before the decommissioning process begins. These guidelines recommend that coal plant owners allow at least six months from the time of announcement to the first step of decommissioning.

Engage in stakeholder consultations and dialogues: A just transition will require coal plant owners to engage in early and sustained dialogue and consultations with affected stakeholders. We recommend this social dialogue focus on understanding potential impacts of the coal transition and achieving a degree of consensus on the coal plant owner's asset-level just transition plan. A credible social dialogue would be inclusive, engaging women, youth, and vulnerable groups. These groups are often underrepresented in senior management positions with decision-making influence in the energy sector and coal transition, and data concerning the impacts of the transition on them is often limited. Focusing on diversity in the dialogues can support the data collection and evaluation of gender- and minority-related risks of the coal transition, supporting businesses' broader pushes to incorporate women's and vulnerable groups' rights.

With affected workers — including formal, informal, any relevant union or labor bodies, and contracted workers both employed directly by the coal plant or in any mines that rely on the coal plant as the primary off-taker discussions could cover social protection, including a plan for mitigating worker impacts and for providing decent jobs.^{xxi} This could include the timeline for plant closure, relief or redundancy packages, and reskilling/retraining of workers, as applicable.

^{xx} For example, adoption of international labor standards as laid out by the International Labour Organization. ^{xxi} Stakeholder dialogue for mine mouth coal plants in particular should include coal miners who are likely to be affected by the plant closure.

For communities, engagement could include discussions about timeline and process for coal plant closure, remediation process, plans for site repurposing, and environmental and health risk mitigation strategies. Engagement is likely to look different depending on the context. In some cases, engagement could focus more strongly on soliciting comments and gaining buy-in on existing plans; in others, a coal plant owner may be going to the local community to define various options for a transition plan. Finally, coal plant owners would be expected to disclose the expected impacts of the transition and their just transition plan to local and regional governments, which will be important to support broader regional just transition planning.

Conduct impact assessments: In partnership with government and regulators, these guidelines recommend that coal plant owners commit to conduct environmental and social impact assessments of the coal plant closure on its workers, direct supply chain workers, and communities. Social impact assessment areas that coal plant owners could be expected to lead are on the impact to its workers — including any distributional or gender-specific impacts across its workforce^{xxii} — and its supply chain (e.g., impact on mines for mine mouth plants, where the plant is the major off-taker). Additionally, coal plant owners could consider assessments related to the social impacts of reclamation, remediation, or new construction projects — including the risks of gender-based violence from additional short-term workforce.^{xxiii} Environmental assessments that a coal plant owner could be expected to lead include environmental needs related to remediation of the site, or potential negative environmental impacts of the replacement generation or proposed use of the coal plant site after decommissioning. Integrated utilities could also be expected to assess and report on impacts to ratepayers, including any distributional or energy access impacts (see **Box 6**).

Assessments that a government is likely to lead, but a coal plant owner could be expected to support through data disclosure and collaboration, include socioeconomic impact assessments especially at a regional/provincial level (e.g., retrenchment, loss of tax revenues, multiplier effects in the economy, opportunities for economic diversification, and gender- and minority-specific impacts) and identification of key gaps in policies (e.g., social protection, labor standards, or diversification).

Report on and develop plans to minimize adverse impacts on communities: These guidelines recommend coal plant owners develop impact mitigation plans in collaboration with communities, government, and other stakeholders when possible using a data-driven approach based on impact assessments. At a minimum, credible plans would include a site audit and plan to ensure a safe site and closure process, as well as a process for monitoring environmental and other health and safety impacts throughout the decommissioning process. More robust monitoring processes, including of other social and economic impacts, are encouraged and may be critical considering they can attract future investments to support economic diversification and leverage opportunities associated with transition.

Box 6: Mitigating impacts of the coal transition on energy burden

In addition to providing a just and equitable transition for workers and communities, a credible coal transition would also mitigate the impacts of the coal transition on electricity customers. Although protecting customers will likely be a key tenet for both the credibility and political feasibility of CTMs, we have not included it as an explicit guideline because it may be difficult for certain coal plant owners and funders to prove how a CTM mitigates impacts on energy burden (i.e., the onus of proof may be outside of what a coal plant owner can reasonably influence). Despite not including it here, we believe energy burden is critical, and in most cases still addressed through other outlets:

^{xxii} For example, female and vulnerable group employment may be concentrated in jobs requiring low science, technology, engineering, and mathematics (STEM) skills, which are more vulnerable to a shift in automation and may be less transferable, or are underrepresented in senior management positions where decision-making takes place.
^{xxii} In many cases, mitigating these impacts is likely to be a shared responsibility across coal plant owners and governments.

- For **regulated utilities**: In the recommended social, economic, and environmental assessments above, we propose that a regulated utility would need to assess and report on the CTM transaction's impact on energy burden, access, and, when possible, distributional effects on electricity customer costs. A regulator is likely to include provisions to help ensure ratepayer impacts are minimized, as is the case in robust securitization legislation in the United States.25
- For **IPPs in regulated markets**: A regulator would almost certainly be involved in the negotiations of a CTM transaction with an IPP, approving the canceling or renegotiation of PPA contracts. Regulators are unlikely to approve transactions that result in excessive additional energy burden compared with the case of accelerated retirement without a CTM.

Based on additional deals that move forward, future CTM certification standards or guidelines could incorporate energy burden as an explicit guideline if needed.

Support relief and reskilling opportunities to affected workers: In negotiation and consultation with workers and labor unions, coal plant owners could be expected to develop a worker transition plan that would support access to jobs, facilitate redeployment through retraining (e.g., reskilling for affected workers, educational support, career counseling and job placement resources, relocation support for displaced coal workers), and provide relief support (e.g., temporary wage differential, pension or health care support or guarantees, and relocation support for displaced coal workers, among other things).^{xxiv}

These activities need not be undertaken directly by the coal plant owner itself, but may be done in partnership with governments, unions, NGOs, or other organizations in line with social and diversity goals. The expansion of renewable energy and the related need for skilled workers can provide an opportunity to increase the number of women and other underrepresented groups in the energy sector. Although it is difficult to ascertain the impact on induced employment because of the coal plant operations, coal plant owners may also engage with the local community through experts to establish and record the level of induced employment and its contribution to the local economy.

Conduct remediation and reclamation: A critical component of the just transition process is remediation and reclamation of the coal plant site. Remediation refers to removal, reduction, or neutralization of hazardous material, waste, and other substances from a site, while reclamation is the process of converting the site to a state it can be redeveloped for other productive uses. At a minimum, these guidelines suggest coal plant owners develop and implement a remediation plan that ensures a safe site for the community (e.g., cleanup of hazardous materials or other contaminants) and includes information about how remediation activities will be financed.

Beyond ensuring safety for the community, the extent of the remediation and reclamation would be determined by the planned use of the site and availability of financing and local regulation, and be agreed upon with local communities. The stakeholder consultation process would ideally involve a discussion about future redevelopment goals for the site, which would inform the extent of cleanup and reclamation to be done. The coal plant owner and any other counterparties responsible for remediation, reclamation, and any replacement construction may be expected to mitigate for the risks of gender-based violence and other health risks associated with construction and heavy industry projects, for example, through the provision of education, community support groups, and legal services to workers and the community.

^{xxiv} Retraining plans ideally should be developed in tandem with local governments and informed by economic development analyses to identify gaps and opportunities for job creation and diversification.

3.4 Stage gate 4: Does the transaction provide transparency and accountability to outcomes?

Financial institutions and regulators are likely to require specific disclosure from coal plant owners based on their needs and local regulation. As a result, we focus on the public reporting that can help increase transparency and reduce the reputational risks of transactions. These guidelines put forward a recommendation for minimum public reporting but also suggest that additional reporting would lend further credibility to transactions. Finally, we recommend that CTM transactions, at a minimum, put in place governance, incentive, or recourse mechanisms that help ensure the achievement of intended climate and social outcomes.

Guideline 8

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Challenge: Providing financing to coal plant owners can create reputational risks if the transaction does not provide confidence and **build trust** that it results in positive climate outcomes while protecting affected stakeholders from major impacts of the coal transition.



Guideline 8: The transaction provides transparency and an accountability mechanism to climate and social outcomes.

The below recommendations are focused on the minimum information that would provide transparency to the public about a CTM transaction's climate and social impact. They include disclosure against some of these guidelines, as well as on the governance and incentives to ensure the CTM transaction delivers on intended climate and social outcomes (see **Exhibit 6**). These disclosures would be reported in addition to any reporting requirements specific to instrument types (e.g., reporting requirements for sustainability-linked or other labeled instruments). Although we recognize that additional reporting could bring greater costs to coal plant owners, public reporting beyond these guidelines is encouraged, because it would lend further transparency to transactions, mitigate reputational risks, and ultimately enable the scale-up of CTMs.

Exhibit 6 Recommended Public Disclosure for CTM Transactions



STAGE GATE 1

Is it credible to provide finance to support the transition of the coal plant?

Recommended minimum disclosure

 Entity-level public commitment to no new coal beyond plants that have reached financial close or final investment decision

Additional possible disclosure

• Fair value of the coal plant/summary of proceeds provided for the coal plant transition

STAGE GATE 2

Does the coal transition pathway proposed by the transaction support 1.5°C goals?

Recommended minimum disclosure

- Description of the coal transition pathway, including the planned operation, repurposing, and/or replacement of the coal plant and its retirement date
- Description of the role of finance in the transition of the coal plant, including how it supports emissions savings and mitigates impacts compared with an accelerated coal transition without a CTM
- Summary of the generation and disposition of carbon credits associated with the project. Use of proceeds from monetizing such credits should be consistent with requirements for other financing instruments

Additional possible disclosure

- Quantification of how the CTM transaction mitigates impacts on electricity system costs compared to an accelerated coal transition without the transaction. This could be as simple as disclosing the relative cost of capital between the coal plant owner and the CTM financing package.
- · Estimation of emissions savings and their timing



STAGE GATE 3

Does the transaction include a plan and provisions to support a just transition?

Recommended minimum disclosure

• Description of how the just transition is considered in the transaction and coal plant transition

Additional possible disclosure

- Description of the just transition plan for the asset
- Disclosure of how the just transition is financed, including the proceeds from the transaction for the just transition plan

STAGE GATE 4

Does the transaction provide transparency and accountability to outcomes?

Recommended minimum disclosure

Description of the general governance and incentive structure of the transaction (e.g., escalation processes, recourse mechanisms, disbursal schedule, or incentives) to support achievement of climate and social outcomes

Additional possible disclosure

Annual reporting against climate and social outcomes
 while the transaction remains outstanding

4. Next steps and future work

This working paper lays out an initial framework for assessing CTM transactions. In the guidelines' current form, we hope they can be an engagement tool for informing the design of pilot CTM deals, supporting the creation of metrics or plans for broader CTM programs, and enabling funders and coal plant owners to demonstrate the

credibility of transactions. However, we welcome further evolutions to these guidelines and recognize they are only the beginning of a broader scope of work needed to advance credible CTMs. This could include:

- Developing a standard for certifying CTMs as sustainable finance instruments, which would likely require more detailed, objective, technical criteria against which to assess transactions
- Applying guidelines to assess coal deals against country-specific coal transition plans, including emerging investment plans that are being developed by major coal economies
- Development of methodologies for the credible generation of carbon offsets from CTMs, including standards for estimating and monetizing emissions savings from CTMs, and the role of offsets in enabling credible transactions to move forward
- Informing and supporting metrics for financial institution reporting on CTMs, enabling financial institutions to credibly demonstrate their provision of financial services to coal plant owners in support of the coal transition

5. The guidelines in practice: Illustrative examples across market and instrument types

The following cases (see **Exhibit 7**) offer examples of how these guidelines would apply to transactions in specific markets. They include one backward-looking example of a ratepayer-backed bond securitization transaction in the United States, a hypothetical sustainability-linked bond transaction in Indonesia, and an illustrative case for an IPP.

Case	Type of owner	CTM type and coal transition pathway	Role of finance	Key considerations across the CTM guidelines
Early retirement of the San Juan Generating Station units 1 and 4 in the	retirement Regulated Ratepayer-backed e San Juan investor-owned securitization to er rating utility in the the early retiremen on units 1 United States coal units and in the (Public Service replacement with o ed States Company of New generation al deal) Mexico [PNM])	Ratepayer-backed bond securitization to enable the early retirement of coal units and replacement with clean	• Enabled the early retirement of coal units that were insulated from competition and were provided regulated returns	Deal goes above and beyond guidelines: Securitization is overseen by a regulator, and the securitization legislation in New Mexico requires provisions that often exceed these guidelines (e.g., reducing energy burden, disclosure, just transition).
United States (actual deal)		generation	 Reduced costs for electricity customers by enabling replacement of coal with cheaper clean energy and through the refinancing of the coal units with a lower-cost bond Unlocked financing for worker retraining and relief and community transition support 	Additionality (Guideline 3): Case shows it may not be appropriate to assess additionality or early retirement against existing plans or commitments, because these commitments may be based on the ability to leverage CTMs. Just transition (Guideline 7): Decision on replacement resources underscores the role of stakeholder engagement in informing resource planning and replacement resources. Ultimately, replacement resources were based on multiple criteria beyond cost, including local investment in communities, climate impact, and economic development potential.
Early retirement of a fleet of coal units in Indonesia (illustrative deal)	Regulated state- owned utility Perusahaan Listrik Negara (PLN)	Sovereign sustainability-linked bond (SLB) to enable the early retirement of coal plants without immediate replacement in a market with excess capacity	 Could enable the early retirement of coal that is insulated from competition and provided regulated returns Could likely reduce electricity system costs by refinancing the coal plant with a lower-cost bond 	 Plant eligibility (Guideline 1 and Guideline 3): Although SLBs generally do not require disclosure on proceeds, the guidelines would require transparency on any coal assets that would be transitioned using finance raised through the SLB. No new coal commitments (Guideline 2): These guidelines would entail PLN and/or the Indonesian government to address plants in early stages (not yet)

Exhibit 7 Summary of how the guidelines would apply in three cases

Repurposing of an IPP-owned coal plant under a PPA (illustrative deal in a generic market)

IPP with a PPA with a single buyer

- Managed transition vehicle, where a specialpurpose vehicle (SPV) acquires the coal plant from the IPP and repurposes it for flexibility, reducing its overall dispatch / capacity factor and retiring it early
- Enables emissions savings and early retirement of a coal plant that was otherwise protected under a long-term PPA

reached financial close) and close loopholes related to future coal development.

Additionality (Guideline 3): Case study underscores that it may not be appropriate to assess fair value and NPV at a plant level, and remaining balance may be more appropriate for regulated utilities.

Electricity planning (Guideline 6): Because the coal plants will not be fully replaced with clean generation, electricity planning (e.g., through a robust Electricity Business Plan [RUPTL]) and decarbonization commitments would help validate emissions savings through the transaction.

Backsliding risk (Guideline 5): Backsliding risk in this case would be mitigated by ensuring the new PPA term is less than or equal to the original term.

Leakage risk and electricity planning (Guideline 6): Because the coal plant generation will not be fully replaced with clean generation, power system resource planning and decarbonization commitments would help validate emissions savings through the transaction.

Just transition (Guideline 7): Just transition responsibilities will likely be shared across the IPP and SPV, given the transfer of ownership of the plant.

5.1 Ratepayer-backed bond securitization in the United States

Utilities in the United States have used ratepayer-backed bond securitization for decades, most recently applying the financial tool to support the early retirement of coal plants in regulated electricity markets. PNM, a regulated utility in New Mexico, utilized securitization to retire units 1 and 4 of its SJGS following the passage of New Mexico's Energy Transition Act (ETA), which authorized the use of securitization for coal phaseout. Based on these guidelines, the PNM SJGS deal met and exceeded recommendations for a credible CTM transaction.

Stage gate 1: Is it credible to provide transition finance for the coal plant?

Guideline 1: The financial close or final investment decision of the coal plant is prior to December 2021, following agreement on the Glasgow Climate Pact.

The SJGS units began operation between 1973 (Unit 1) and 1982 (Unit 4). Most coal units in the United States would be eligible under this guideline. Eighty-eight percent of coal-fired capacity in the United States was built between 1950 and 1990, with a capacity-weighted average age of 39 years for operating coal facilities.²⁶

Guideline 2: The coal plant owner has an entity-level commitment to no new unabated coal power plant development or procurement globally, beyond plants that have reached financial close or final investment decision.

In its 2020–40 IRP, PNM put forward a plan "to enable our transition to a carbon-free goal that eliminates coal from our portfolio at the end of 2024 so that we can begin serving our customers with 100 percent coal-free electricity."²⁷ This commitment covers PNM's emissions from generation and is largely aligned with 1.5°C temperature targets for the United States.²⁸

Guideline 3: The fair value of the coal plant is greater than zero at the time of the proposed coal transition.

As a coal plant owned by a regulated utility, where the local regulation and implementation ensures PNM an agreed upon return on investment or cost recovery, the remaining plant balance (verified by the regulator, New Mexico Public Regulation Commission [NMPRC]) is the most appropriate valuation approach for the CTM.

In its application for the financing order, PNM requested permission to abandon SJGS units 1 and 4 and securitize \$360.1 million in costs, which includes \$283 million as the remaining plant balance (or undepreciated investment) for the two units.²⁹ In New Mexico's ETA, abandonment costs are limited in total to the lower amount of \$375 million or 150% of the undepreciated investment in the facility being abandoned as of the date of abandonment. Abandonment costs may include up to \$30 million that may be collected for plant decommissioning and mine reclamation costs, up to \$20 million for severance and job training for employees losing their jobs as a result of the abandoned facility and any associated mine that only services the abandoned facility, and the undepreciated investment on the utility's books.

Stage gate 2: Does the coal transition pathway proposed by the transaction support 1.5°C goals?

Guideline 4: The CTM results in emissions savings compared with a case without the use of the CTM and has a backstopping commitment to phase out the coal plant by country-specific coal phaseout deadlines.

Guideline 5: The CTM transaction does not extend the expected lifetime for unabated coal combustion.

Guideline 6: 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.

These guidelines all relate to the impact of the CTM on emissions and the future energy provision proposed by PNM and therefore can all be considered together. As established by NMPRC decisions in Case No. 19-00018-UT

and Case No. 19-00195-UT, PNM's proposed retirement of the plants and replacement with a portfolio of clean resources with equivalent electricity services for SJGS (650 megawatts [MW] of solar photovoltaics [PVs], 300 MW of storage, and 15 MW of demand response) was approved by the NMPRC. The transaction did not propose the extension of the lifetime of either plant, and the clean resource replacements are expected to have life-cycle emissions intensity of 100 grams CO2e/kWh or less.

This is in line with the emissions restrictions set in Section 62-18-10 of the ETA that for utilities that receive the securitization bonds, energy procured with a PPA for terms of at least two years and dedicated to serving retail customers shall not emit an average of more than 400 pounds (181 kg) of CO2 per megawatt-hour [MWh] by 2023, and not more than 200 pounds (91 kg) of CO2/MWh by 2032. PNM states that in the two years between 2021 and 2023, the replacement of SJGS with carbon emissions-free resources will decrease PNM's carbon intensity by more than 50 percent, from over 800 lbs/MWh to 400 lbs/MWh. Their modeling demonstrates the emissions savings as a result of the securitization and closure of the plant.

PNM's 2017 IRP mentioned the potential closure of the SJGS units, well before the final passage of the ETA in 2019. However, the inclusion of the early retirement of SJGS was the result of an agreement (as per NMPRC Case No. 13-00390-UT) with NMPRC that PNM would present the most cost-effective portfolios under both a scenario where SJGS continues to operate beyond 2022 and where SGJS completely shuts down after June 30, 2022. PNM's final application for the closure of SJGS came through the ETA securitization transaction described above. Therefore, it is appropriate to attribute the emissions savings to the transaction (i.e., it is unlikely SJGS would have been proposed for retirement if PNM did not expect the securitization legislation to proceed). Additionally, PNM's commitment to closing its coal plants by 2024 as per their 2020 IRP is in line with the IEA's Net Zero pathway.

Stage gate 3: Does the transaction include a plan and provisions to support a just transition?

Guideline 7: The coal plant has a just transition plan to mitigate impacts on workers, electricity customers, and the local community.

The transaction includes several just transition components to mitigate impacts on workers, electricity customers, and the local community. The ETA requires advance notice to the communities at a minimum through the publication of the financing order and consolidated application. PNM filed its Consolidated Application for the Abandonment, Financing and Replacement of the San Juan Generating Station Pursuant to the Energy Transition Act in July 2019. PNM discussed its potential intention to close the SJGS units in its 2017 IRP, which was also made public. PNM engaged Regional Economic Models, Inc. to analyze the economic and demographic impacts of retiring the SJGS. The abandonment of the SJGS will include decommissioning of the SJGS plant and facilities, and reclamation of the coal mine that provides fuel for SJGS. The financing order includes decommissioning and reclamation costs of \$28.6 million.

PNM's proposed financing order under the ETA includes provisions to support economic diversification and development for communities, as well as relief and reskilling opportunities to affected workers. This includes \$20 million for job training and severance for employees at SJGS and the coal mine, \$1.8 million for the Energy Transition Indian Affairs Fund to assist tribal and Native people in the affected community, \$5.9 million for the Energy Transition Economic Development Assistance Fund to develop an economic diversification and development plan for the affected community, and \$12.1 million for the Energy Transition Displaced Worker Assistance Fund to assist displaced workers in the affected community. Each of these three funds requires public input through recommendations from the affected community and a public planning process with at least three public meetings in the affected community.

Stage gate 4: Does the transaction provide transparency and accountability to outcomes?

Guideline 8: The transaction provides transparency and an accountability mechanism to climate and social outcomes.

Although PNM, through public documentation submitted for the ETA and their 2020 IRP, would have met the minimum recommended disclosure under these guidelines, the provisions and required disclosures in the ETA are far more extensive (see **Box 7**). Under the ETA, PNM was required to submit a Consolidated Application for the Abandonment, Financing and Replacement of SJGS including the essential mechanisms needed to assure investors to secure a favorable bond credit rating; detailed breakdown of costs allowed to be securitized, including abandonment costs, financing costs, and transition assistance costs; details on what must be included in the application for a financing order (see **Box 7**) and the finance order itself; and how replacement resources should be procured.³⁰ The ETA also includes a state pledge of noninterference or nonenforcement, agreeing that it shall not take or permit any action that impairs the value of energy transition property.

Box 7: Financing order application (Section 62-18-4)

An application for a financing order shall include:

- **1.** A description of the facility the utility proposed to abandon
- 2. An estimate of the energy transition costs, including severance pay and job training expenses, costs not previously collected for plant decommissioning and mine reclamation, and an estimate of financing costs
- 3. An estimate of the amount of energy transition charges necessary to recover costs
- 4. A description of the proposed adjustment mechanism
- **5.** A memorandum with supporting exhibits from a securities firm that the proposed issuance satisfied current published AAA rating or equivalent rating criteria of at least one nationally recognized statistical rating organization for issuances similar to the proposed energy transition bond
- **6.** A commitment by the utility to file information about the description of the final structure and pricing of the bonds, updated financing costs and payment amounts, and an updated calculation of the energy transition charges
- **7.** An estimate of the timing of the issuance and term of the energy transition bonds; scheduled final maturity for each bond shall be no longer than 25 years
- 8. Identification of plans to sell/transfer interest in energy transition property, including identification of an assignee, and demonstration that the assignee will be a financing entity wholly owned, directly or indirectly, by the qualifying utility that will be initially capitalized by the qualifying utility in such a way that equity interests in the financing entity are at least 0.5% of the total capital of the assignee
- 9. Identification of ancillary agreements that may be necessary or appropriate
- **10.** A description of the proposed ratemaking process to recover or refund any difference between the costs financed by the bonds and the actual costs
- **11.** A description of proposed ratemaking method to account for the reduction in utility's cost of service associated with amount of undepreciated investments being recovered by energy transition charge
- **12.** A statement from the utility committing that it will use commercially reasonable efforts to obtain the lowest energy transition charges consistent with prevailing market conditions at the time of pricing of energy transition bonds and the structure and terms of the energy transition bonds

An application for a financing order may include:

- 1. New requests for approvals for new resources necessitated by abandonment of facility
- 2. Deferral for approval of new resources to a separate proceeding, provided that the application identifies adequate potential new resources sufficient to provide reasonable and proper service to retail customers

5.2 Sovereign sustainability-linked bond to support the transition of PLN's coal fleet

Next, we consider the hypothetical case of a sovereign sustainability-linked bond (SLB) issued by the government of Indonesia, which could be used to support the transition of several of the state-owned utility's

coal plants. We assume a structure where the sovereign would on-lend or allocate funding raised through the SLB to the state-owned utility, Perusahaan Listrik Negara (PLN). PLN is a vertically integrated regulated utility that owns generation assets and controls system operation. In the example below, we focus on how such a transaction could meet the climate and social guidelines, rather than stipulating how an SLB would be structured financially (e.g., sustainability key performance indicators [KPIs], step-up or bond pricing, role of blended finance). This case is conceptual, offering a vision for what deals could look like from the perspective of these guidelines; they are not based on future expected deals in the country.

Stage gate 1: Is it credible to provide finance to support the transition of the coal plant?

Although SLBs are general purpose instruments without a strong requirement about use of proceeds, meeting these guidelines would require the government of Indonesia, in agreement with PLN, to provide transparency about which coal assets it intends to transition using finance raised through the SLB. These proposed assets would then be assessed against the guidelines below.

Guideline 1: The financial close or final investment decision of the coal plant is prior to December 2021, following agreement on the Glasgow Climate Pact.

To assess eligibility under these guidelines, PLN and the government of Indonesia would provide information to demonstrate to funders that the final investment decisions of plants it would like to transition through the SLB were prior to December 2021. The majority of PLN's coal fleet — representing about 44 percent of Indonesia's existing coal capacity — was built in the last decade, with about 87 percent of its planned and operating coal plants operating or under construction as of 2022.^{xxv31}

Guideline 2: The coal plant owner has an entity-level commitment to no new unabated coal power plant development or procurement globally, beyond plants that have reached financial close or final investment decision.

As funding is raised at a sovereign level and allocated to PLN, climate commitments and planning could be at the sovereign and/or utility level. For PLN commitments, the guidelines suggest the boundary be set at the parent-company level to include PLN's various power generation subsidiaries.

At a minimum, these guidelines recommend that the Indonesian government and/or PLN commit to no new unabated coal generation or expansion beyond coal plants that have reached financial close or final investment decision. This would apply to both coal plants developed by PLN and coal generation procured through IPPs. The Indonesian government has already pledged to stop building new coal plants beyond those in its pipeline.^{32,xxvi} As a result, fulfilling these guidelines would mean PLN and the government of Indonesia commit to addressing coal plants in early stages of the pipeline and close any loopholes related to future coal power development in the country.

Additional entity-level commitments and plans would lend further credibility to the transaction. Already, Indonesia announced plans to phase out coal by 2056, and recently the finance minister publicly stated that Indonesia could move the phaseout date to 2040 if provided financial assistance from the international community. PLN also has a commitment to reach net-zero emissions by 2060.

Guideline 3: The fair value of the coal plant is greater than zero at the time of the proposed coal transition.

^{xxv} RMI analysis based on Global Energy Monitor data.

xxxi Indonesia recently passed a regulation that would permit new coal in some cases, including if it provides electricity to refineries or smelters, if it is a nationally strategic project, or if it can commit to cutting emissions by 35percent within 10 years of operation.

Due to a decree from the Ministry of Finance, PLN is provided timely cost recovery for its investments and operations because of its status as a public service company.33 Although electricity tariffs in Indonesia today do not fully cover PLN's cost recovery, PLN receives a monthly and quarterly subsidy from the government of Indonesia to enable its cost recovery plus an agreed return on equity.34 As a result, CTM financing could add value by enabling the early retirement of plants that are insulated from competition and likely reduce the impact of an accelerated coal transition on electricity system costs (e.g., by reducing the need for accelerated depreciation of the asset, which would likely lead to near-term spikes in PLN's required revenues, and/or by refinancing the coal plant's remaining value with a lower cost of capital) (see **Exhibit 8**).^{xxvii}

Exhibit 8 Comparing the Impact of Financing Options for Coal Plant Transitions



CASE A: Business-as-usual operation

Continued operation of coal plant through remaining useful life



CASE C: Accelerate coal retirement without a CTM

Regulatory asset, retirement, dispatch of grid, then invest in renewables at a later stage



CASE B: Accelerate coal retirement without a CTM Accelerated depreciation of coal plant, retirement, dispatch of



0 5 years

CASE D: Impact of CTM

CTM enables earlier retirement of coal plant while mitigating cost spikes and long term electricity system costs



^{xxvii} Accelerated depreciation would entail PLN achieving cost recovery plus its agreed upon return in a shorter period than the plant's original depreciation schedule. The creation of a regulatory asset would enable PLN to retire the coal plant but also continue to keep the asset on its balance sheet, allowing it to recover capital costs from ratepayers and/or taxpayers even if the plant is no longer operating.

As a regulated utility, the fair value of PLN-owned coal plants is likely their net plant balance (i.e., plants that have remaining useful life and undepreciated balance, on which PLN is still eligible for cost recovery). To provide further credibility, the energy regulator, the Ministry of Energy and Mineral Resources' Directorate General of Electricity, would ideally confirm remaining balances.

Stage gate 2: Does the coal transition pathway proposed by the transaction support 1.5°C goals?

Several transition pathways would be possible for PLN-owned coal plants. Here we consider a case where PLN has excess dispatchable capacity through approximately 2025, allowing it to retire coal capacity without immediate replacement and still maintain its reserve margin target.

Guideline 4: The CTM results in emissions savings compared with a case without the use of the CTM and has a backstopping commitment to phase out the coal plant by country-specific 1.5°C-aligned coal phaseout deadlines

Guideline 5: The CTM transaction does not extend the expected lifetime for unabated coal combustion

Guideline 6: 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.

In this case, we assume PLN would retire coal capacity, dispatch existing grid resources for several years, and invest in new clean generation once demand increases beyond its current supply (see **Exhibit 8d**). This pathway, while not immediately replacing lost coal generation with clean generation, provides PLN flexibility to manage its excess capacity challenge while reducing emissions and bringing forward the expected investment in clean generation compared with a case without a CTM.

However, these guidelines recommend that PLN demonstrate that the transaction will result in emissions savings at an electricity system level by revising power-system-wide decarbonization targets and expanding detailed system-level planning to support their achievement. The outcome of these efforts will need to show when and how retired coal generation will be replaced by an increasingly decarbonizing grid.

PLN could demonstrate credible transition planning through a revision of its Electricity Business Plan (RUPTL), which lays out the government and PLN's resource plans for generation, transmission, and distribution over 10-year periods based on projected energy demands. To meet these guidelines, the RUPTL would need to include transparency on planned capital expenditure and operations of its generation fleet to meet its climate targets.

These guidelines recommend that any new planned investments in natural gas generation under the RUPTL would need to be aligned with PLN's climate targets and have transparency about the capacity factors, lifetimes, and role of natural gas in the power system. Further credibility of gas in the RUPTL would be demonstrated through a comparison of alternatives that shows natural gas is the most effective solution to meet power sector reliability and energy affordability needs. In addition to the costs of natural gas to the electricity system, the analysis should ideally include an assessment of the necessary demand from the power system needed to justify and support any new gas infrastructure investments (e.g., liquefied natural gas terminals or pipelines).

Stage gate 3: Does the transaction include a plan and provisions to support a just transition?

Guideline 7: The coal plant has a just transition plan to mitigate impacts on workers, electricity customers, and the local community.

Meeting these guidelines would mean PLN, in collaboration with the government of Indonesia, develops assetlevel just transition plans for any of the coal plants proposed for transition. This would include engagement processes, a commitment to develop impact assessments, and just transition plans for each of the coal assets it aims to transition.

While this asset-by-asset approach would meet these guidelines, there is also likely benefit to PLN and the government of Indonesia developing entity-, provincial-, or national-level just transition frameworks alongside asset-level provisions. Given the importance of coal in Indonesia's economy — creating jobs across both the power and mining sectors, providing government revenues and spillovers to local communities — setting plans and frameworks at these levels could help capture any scaling opportunities that may come from transitioning a portfolio of coal plants (e.g., in retraining programs), systemic impacts (e.g., across regions or at a macroeconomic level), mobilization of resources (e.g., for just transition programs rather than one-off investments), and support gender and social priorities (e.g., improving understanding and evaluation of gender-and minority-related impacts of the energy transition). For example, in South Africa, where coal also plays a major role in the economy, a Presidential Climate Commission led a centralized engagement process to drive consensus on a just transition framework for the country, while Eskom has partnered with the South African Renewable Energy Technology Centre to develop a retraining program that supports a just transition of coal workers.³⁵

Furthermore, the government of Indonesia's National Medium-Term Development Plan (RPJMN) 2020–24 enlisted gender equality as an area that should be mainstreamed into Indonesia's overall development strategy, alongside increasing work from PLN to support female empowerment in the energy sector.³⁶ Effectively incorporating gender and diversity goals into the economic and social assessments and implementation stages of the just transition plan may highlight an opportunity to improve the representation of both women and other underrepresented groups in the energy sector.

Stage gate 4: Does the transaction provide transparency and accountability to outcomes?

Guideline 8: The transaction provides transparency and an accountability mechanism to climate and social outcomes.

Finally, a credible transaction would follow the reporting guidelines outlined in this brief, as well as any reporting and governance guidelines for an SLB.xxviii In addition, the following characteristics would lend further credibility to the bond structure.

- **Governance:** While SLBs will have a governance and incentive structure as part of the mechanism, it will be important for SLBs that support coal transition to include KPIs tied to climate and just transition outcomes.
- **Transparency on coal funding:** While SLBs do not usually require reporting on use of proceeds, to provide transparency and credibility to the coal transition, the government of Indonesia could consider disclosing funding amounts allocated to the coal transition (e.g., remaining plant balance, decommissioning costs) and the just transition, where relevant.

5.3 Managed transition vehicle for an IPP

Finally, we consider the hypothetical case of an SPV that would purchase and transition IPP-owned coal plants in a regulated market, reducing emissions through accelerated retirement and/or repurposing of the coal assets it purchases. For this illustrative case, we explored the following scenario:

xxviii For example, in line with International Capital Markets Association's Sustainability-Linked Bond Principles (https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/June-2020/Sustainability-Linked-Bond-Principles-June-2020-171120.pdf).

- The coal plant is a mine mouth plant owned by an IPP that is a multinational energy company, with both clean and fossil fuel generation exposure globally. The coal plant has a 30-year PPA through 2045.
- The managed transition vehicle will purchase the IPP-owned plant, renegotiate its PPA, repurpose the coal plant for more flexible operation reducing minimum offtake requirements under the PPA and retire the coal plant in 2035.

Stage gate 1: Is it credible to provide finance to support the transition of the coal plant?

Guideline 1: The financial close or final investment decision of the coal plant is prior to December 2021, following agreement on the Glasgow Climate Pact.

To be eligible for financing under these guidelines, the coal plant units would need to have reached financial close prior to December 2021. Because units may be separate projects with different investors and PPAs, the eligibility date would be considered on a unit-by-unit, or PPA-by-PPA, basis. We have assumed a coal unit that began commercial operation in 2015, prior to Glasgow.

Guideline 2: The coal plant owner has an entity-level commitment to no new unabated coal power plant development or procurement globally, beyond plants that have reached financial close or final investment decision.

These guidelines would recommend the IPP set a no-new-coal generation or expansion commitment. Given it is a multinational energy company, we recommend the IPP set its commitment at the parent level. Additional entity-level climate commitments and transition planning would add credibility to the transaction but could pose challenges for an IPP. In many cases, an IPP's coal assets may be tied up in long-term PPAs, which it may have less flexibility to terminate without incurring substantial costs and/or impacting its relationship or reputation as a project developer in a country.

Guideline 3: The fair value of the coal plant is positive at the time of the proposed coal transition.

The fair value of the asset to the IPP would be the NPV of the PPA cash flows. CTMs could be important tools for coal plants with long-term PPAs that provide owners stable cash flows through the length of the PPA term, providing little economic incentive to retire otherwise.

Stage gate 2: Does the coal transition pathway proposed by the transaction support 1.5°C goals?

Guideline 4: The CTM results in emissions savings compared with a case without the use of the CTM and has a backstopping commitment to phase out the coal plant by country-specific 1.5°C-aligned coal phaseout deadlines.

Guideline 5: The CTM transaction does not extend the expected lifetime for unabated coal combustion.

Guideline 6: 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.

Given the original PPA term extends to 2045, a fair baseline could assume continued operation of the coal plant through the PPA term, in line with the original IPP owner's NPV assumptions (see **Exhibit 9**).

Exhibit 9 Comparing the Impact of CTM for Financing of PPAs

Variable operating costs

Business-as-usual scenario

Fixed operating costs 📕 Capital recovery 🗧 Grid costs

CTM scenario

Continued operation of coal plant through remaining PPA term

Repurposing of coal plant for flexibility, with grid dispatch and some new renewable generation to replace lost coal generation

New renewable generation



Even without the immediate retirement and replacement of the coal plant, repurposing and early retirement could support emissions savings in the power system in two ways. First, re-signing a shorter PPA would result in overall emissions savings compared with the baseline due to the accelerated retirement of the plant. Second, further emissions savings could be realized through the decreased utilization of the coal plant, and instead dispatching a larger share of grid resources and/or new clean generation.

Exhibit 9 illustrates how these two scenarios would conceptually look from an electricity cost perspective. For conceptual clarity, the figure presents the baseline and CTM cases at an asset level. However, these guidelines recommend that emissions savings should ideally be validated at a system level. In particular, power-sector-level commitments and planning would help demonstrate the emissions impact of the transaction. This could mean the off-taker would need to put in place long-term decarbonization commitments and integrated resource plans, similar to the PLN case above.

Finally, in this case, we assumed the SPV would renegotiate a PPA term to end in 2035, 10 years before its expected retirement date. This would be within the phaseout timelines for many non-OECD countries and ensure the timeline for unabated coal combustion is lower than the coal plant's original expected lifetime.

Stage gate 3: Does the transaction include a plan and provisions to support a just transition?

Guideline 7: The coal plant has a just transition plan to mitigate impacts on workers, electricity customers, and the local community

In this situation, the responsibility for the just transition plan would likely be shared by both the IPP, particularly around a workforce transition, and the SPV, which will ultimately take over operations and eventual decommissioning of the coal plant. We recommend these plans be developed in collaboration with regional governments, communities, workers and unions, and other affected stakeholders (including the coal mine operators and the miners) and should be inclusive of gender and minority interests.

A just transition plan would ensure clear communication to communities, workers, and other affected stakeholders of the planned transition of the coal plant, including clear timelines and plans for the transition. In addition, it would be developed in consultation with stakeholders that would be affected by the plant repurposing and eventual closure (workers, unions, governments, and communities). These consultations would provide an avenue for open and transparent dialogue where stakeholders would gain an understanding

of the potential impacts of the plant transition (e.g., any emissions or health-related risks that could arise through changing operations of the coal plant, or social implications of any required heavy construction projects) and a degree of consensus on the coal plant's just transition plan. Ensuring representation from women young people, and other vulnerable groups who are particularly vulnerable to economic changes and services disruption will ensure the implications of the transition mechanism are considered holistically and that the implementation phases, such as training and capacity building, are appropriately accessible.

The IPP and SPV would also be expected to have plans to conduct environmental, economic, and social impact assessments of the coal plant transition and closure on the local community and workers, and report on plans to minimize any impacts. Repurposing for flexible use might involve a reduction of workforce, so it would be important for two social impact assessments to be conducted: one focused on the impacts of the plant repurposing and one focused on the plant retirement in 2035. When the coal plant is retired, the SPV would need to conduct remediation and reclamation at the site, with reclamation plans developed in consultation with local communities to ensure any social risks associated with the plans are effectively mitigated, for example, through education programs, community support groups, and provision of legal services if needed.

On a just transition for workers, the IPP could work with the SPV on a plan for either transitioning workers to the SPV, or provide relief or reskilling support for workers not transitioning to the SPV operation. Further, the SPV would develop plans for the ultimate reskilling, retraining, or relief for workers when the plant closes at the end of the renegotiated PPA term

Stage gate 4: Does the transaction provide transparency and accountability to outcomes?

Guideline 8: The transaction provides transparency and an accountability mechanism to climate and social outcomes.

To ensure credibility, the counterparties in the ETM transaction would follow the minimum reporting guidelines outlined in this brief, as well as any reporting and governance guidelines and requirements from the ETM investors (public or private). This reporting responsibility is likely to be shared between the IPP and the SPV.

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