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Transition Credits: A Potential Financial Enabler for the Coal-to-Clean Switch

Monetizing avoided emissions to bridge financial gaps in early coal plant retirements

Ramnath N. Iyer, Sustainable Finance Lead, Asia

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Key Findings

Transition credits, a proposed new category of carbon credits, aim to monetize the emissions avoided through early coal-fired power plant (CFPP) closures and their replacement with clean energy.

Closing a profitable CFPP poses an economic challenge, as early closure usually lowers the net present value (NPV) of the plant's future cash flows. Early shutdown requires compensation up to the NPV of foregone cash, and replacing its capacity with renewables can add further investment costs.

The early shutdown of fossil fuel projects presents substantial economic hurdles and extensive financing requirements. The loss of a plant shutdown is estimated to range from USD11-52 per metric tonne of carbon dioxide equivalent ($MTCO_2e$) avoided, suggesting transition credits could bridge this fiscal deficit.

Transition credits face valuation and replicability challenges, with pricing varying by project and location. Social costs are difficult to allocate, and falling renewable energy costs raise additionality concerns. Despite these challenges, transition credits could establish realistic carbon price benchmarks and stimulate Asian market development.

Executive Summary

The Asia-Pacific region remains dependent on coal as the primary source for electricity generation despite the rising penetration and falling costs of clean, renewable energy. An important reason for the slow transition to clean energy lies in the region's large number of young power plants (operational for less than 15 years). Retiring these profitable power plants early requires compensating owners and operators for foregone earnings. These compensation costs have proven challenging to finance, contributing to delays in the energy transition.

Transition credits are proposed financial instruments aimed at placing a monetary value on emissions avoided through the early closure of coal-fired power plants (CFPPs). The credits could then help finance the shutdown. The concept seeks to bridge the economic gap in accelerating the phase-out of coal power by creating a new category of carbon credits.

Transition credits have the potential to play a key role in developing regional carbon markets by pricing carbon emissions based on costs. They can also bring transparency to emissions pricing as the value would be directly derived from emissions avoided. A credible transition credit instrument could help mobilize finance aligned with avoided emissions and attract a broader range of financial market participants — whether through carbon credit portfolios, impact investing programs, or blended finance structures.

However, transition credits are likely to remain case-specific since the carbon abatement calculation will differ from project to project based on factors such as plant age, efficiency, and historical carbon emission record. Also expected are significant cost variations based on each plant's specific financial structure, cost of capital, and power purchase agreement (PPA) flexibility, among others.

Initial estimates from various early models suggest a wide range in potential transition credit pricing, from USD11-12 to USD52 per metric tonne of carbon dioxide equivalent ($MTCO_2e$). Given the variation in potential valuations at the time of issuance, transition credits may initially serve only as niche financing instruments, albeit high-quality ones, if designed well. Alternatively, if proven viable, transition credits could be scaled up through national-level implementation, unlocking economies of scale.

The transition credit concept faces several challenges that must be addressed to build credibility and encourage widespread adoption. Apart from the replicability and pricing difficulties, the social and "just transition" costs can also be complicated to estimate and allocate to specific units. Another potential hurdle lies in the declining costs of renewable energy, which may raise questions about the additionality of transition credits — particularly if renewables are already cost-competitive. However, the slow pace of the energy transition in many Asian countries, despite declining renewable costs, suggests that innovative instruments like transition credits could still play a critical role. In particular, they may offer valuable financing solutions in parts of Asia where significant disparities exist between newer and older plants' generation costs.

Like other forms of carbon offsets, transition credits face the challenge of accurately estimating the quantity of carbon avoidance. Several organizations are currently developing methodologies to support these calculations. However, the risk of system misuse cannot be eliminated. Similarly, another concern is ensuring that the coal left unused (avoided carbon emissions) is not extracted and repurposed for future power generation or other uses. To address this, it may be necessary for the national authority in the country where the plant or mine is located to provide such a guarantee.

Multiple approaches are likely to be needed to accelerate power system decarbonization in many Asian countries and to reduce future emissions from younger coal plants. Despite the many challenges, transition credits can unlock new pathways for financing coal plant decarbonization. They could also be instrumental in setting more realistic benchmarks for carbon prices in Asia, helping to spur market development, particularly in countries where carbon pricing is either absent or insufficient to drive a meaningful shift from coal to clean energy.

What are Transition Credits

Transition credits are proposed climate finance instruments similar to carbon offsets and credits. They seek to monetize the value of emissions avoided by the early closure of coal-fired power plants (CFPPs) and their replacement with clean energy.

The financialization of reduced emissions is central to the concept of transition credits. For credibility, the instruments would need to adhere to globally recognized standards such as the Core Carbon Principles[1] by the Integrity Council for the Voluntary Carbon Markets (ICVCM) and the United Nations Framework Convention on Climate Change.[2] The realization of these credits can occur through independent carbon programs in voluntary carbon markets (VCMs) or within regulated international and national frameworks. The latter encompasses the alternatives outlined in Article 6 of the Paris Agreement.

At the current preliminary stage, the process for generating attractive credits for buyers and issuers is still under development. The focus is on establishing reliable methodologies that will instill confidence in potential credit buyers, thus enabling finance to be raised using a credible instrument. In Asia, the Monetary Authority of Singapore (MAS) has led by forming the Transition Credits Coalition.[3] This group examines the feasibility of incorporating transition credits for financing the early retirement of coal-fired electricity generation facilities.

This report examines the potential for transition credits as financing instruments, the opportunities and limitations of scalability and replicability, and the expected trade or transaction values. As reputable institutions and carbon credit methodology verifiers such as Verra, American Carbon

[1] The Integrity Council for the Voluntary Carbon Market (ICVCM). The Core Carbon Principles.
[2] United Nations Framework Convention on Climate Change. Paris Agreement Crediting Mechanism.
[3] Monetary Authority of Singapore (MAS). Transition credits.

Registry (ACR)/Winrock International, Gold Standard, and the Asian Development Bank (ADB)[4, 5, 6, 7] work on building robust mechanisms to ensure credible mitigation credits, it should be emphasized that unassailable methodologies are necessary for validity.

The Need to Switch from Coal-Fired Power

The Asia-Pacific region hosts nearly 5,000 CFPPs[8], making the rapid elimination of coal a particularly complex challenge. Asia's increasing electricity needs result from economic growth, expanding communities, and rising affluence. Local energy strategies further reinforce coal reliance in these economies. 44% of the total electricity generation in the Association of Southeast Asian Nations (ASEAN) was from coal, the largest source of power in 2023, and the increase in power production from 2022 was accounted for by fossil fuels.[9] The Coal Transition Exposure Index by the International Energy Agency (IEA) ranks Asia-Pacific markets among the five most coal-reliant economies.[10]

Carbon emissions from coal-fired electricity generation are a global concern, necessitating substantial reductions by 2030 and complete elimination by 2040. Although coal usage is expected to plateau globally around current levels[11], Asia's consumption will likely increase for several years. The majority of CFPPs currently planned or under construction are concentrated in this region.[12]

While clean energy adoption alongside fossil fuel elimination is expected to yield economic advantages, immediate financing solutions are necessary to overcome hurdles, many of which relate to electricity market design.

Extended contracts or power purchase agreements (PPAs) with clauses guaranteeing capacity fees and operations for up to 25 years make reducing reliance on existing coal energy plants challenging. These contractual assurances hinder the adoption of more affordable, clean alternatives, creating a significant barrier to the energy transition.

The regulatory landscape further complicates matters, with over 90% of Asia-Pacific's coal-fired energy plants operating in highly regulated markets.[13] These facilities are often insulated from market

[4] Verra. Accelerated Retirement of Coal-Fired Power Plants using a Just Transition Methodology, and Combined Baseline and Additionality Assessment for the Accelerated Retirement of Coal-Fired Power Plants Module. 17 October 2024.
[5] Winrock International. U.S. Department of State, Bezos Earth Fund, and The Rockefeller Foundation select Winrock International as the crediting body for energy transition. 11 April 2023.
[6] Gold Standard. Facilitating a Just Transition Through The Early Phase-out of Coal Fired Power Plants. 6 November 2024.
[7] Asian Development Bank. Energy Transition Mechanism (ETM).
[8] Glasgow Financial Alliance for Net Zero. Financing the Managed Phaseout of Coal-Fired Power Plants in Asia Pacific. June 2023.
[9] Ember. ASEAN's clean power pathways: 2024 insights. 22 October 2024.
[10] International Energy Agency (IEA). Coal in Net Zero Transitions. November 2022.
[11] IEA. Global coal demand is set to plateau through 2027. 18 December 2024.
[12] Global Energy Monitor. Global Coal Plant Tracker.
[13] New Climate Institute. Electricity Market Design in Southeast Asia. 28 October 2024.

forces through government ownership, long-term purchase agreements, or subsidies, even when renewable energy costs from solar or wind are lower than coal.[14]

Asia relies on coal-fired generators for electricity, many of which are relatively new. As of January 2023, these plants average about 14 years in age[15], complicating early closure efforts. Due to PPA termination compensation clauses, premature shutdowns could result in substantial financial losses and increased costs of switching to alternative energy sources.

CFPP operators can be crucial in guiding their national energy sectors towards net zero. Any elimination approach should enable businesses owning high-emitting assets with credible retirement strategies to access a broader range of financing options. This inclusive strategy can facilitate a smoother transition while addressing environmental concerns.

The Cost of Switching from Coal to Clean Energy

Some issues, such as market design, sole buyers, rigid contracts, and unfavorable PPAs, may be relevant in individual CFPP shutdown cases. However, closing a plant that is still a viable power generator is an economic challenge.

The current value of a CFPP is the net present value (NPV) of all its future cash flows. If a plant is shut down early, the owner will likely seek compensation up to the NPV of foregone cash. This amount will be lower in a country with carbon taxes as the NPV is reduced when there is an emissions tax. Most Asian nations have no or minimal carbon emission taxes on power generators.[16]

If renewables were to replace the CFPP's capacity, there would be an additional investment cost. However, this amount would likely be offset by the positive NPV of the cash flows from these investments, reducing the price of the CFPP replacement.

Some Asia-Pacific countries face elevated financing costs, reflecting perceived risks and returns.[17] These expenses may hinder investment and slow the energy shift, emphasizing the need for innovative financial solutions tailored to the region's unique challenges. Financing strategies focusing on future coal elimination are essential for encouraging a systemic transition. These plans must balance reducing the risk of abrupt losses from stranded assets with ensuring that decarbonization efforts align with a nation's growth and social objectives.

[14] ASEAN Centre for Energy. New Renewables Cheaper Than Old Coal In Southeast Asia.
[15] IEA. Coal in Net Zero Transitions. November 2022.
[16] Monetary Authority of Singapore (MAS). Carbon Pricing in Asia. October 2024.
[17] IRENA. The cost of financing for renewable power. May 2023

Transition Credits as a Tool to Bridge the Financing Gap

The "transition credits" term and concept was introduced by the MAS together with the consultancy firm McKinsey & Company in a paper published in 2023.[18]

Figure 1: Early Coal Plant Decommissioning Avoids Emissions

Source: IEEFA.

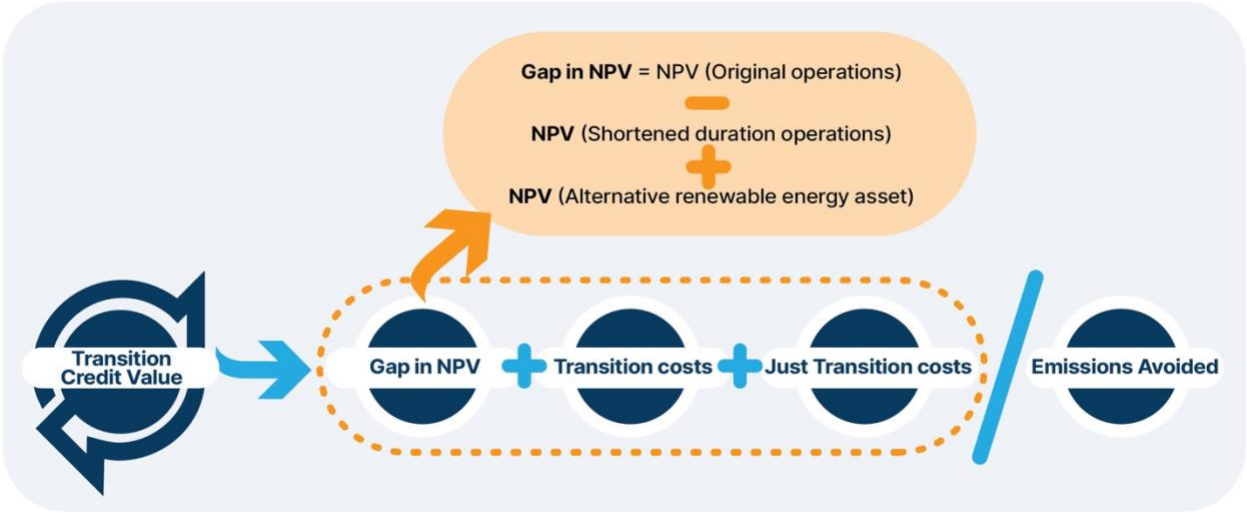
According to this concept, various income streams can be distributed to different investor groups based on risk-return preferences when planning for the early closure of CFPPs and substituting with cleaner sources like renewables. The creation and sale of carbon credits could bridge the economic gap and make the early closure of these plants economically viable. This may thereby provide a portion of the substantial resources likely required to purchase these plants from their owners or to restructure existing loans.

Income flows in such a structure would originate from two sources. The first would be the new PPAs for renewable power generation replacing the CFPP. The other would be where investors will likely provide funds against carbon credits with secured purchase agreements from investment-grade buyers.

The PPA and carbon credit buyer payments could serve as assets and collateral for loans, allowing players in equity and debt to participate in financing. This assumes the credibility and durability of the counterparties, which should be ensured while structuring any deal.

[18] MAS. Working Paper on Accelerating the Early Retirement of Coal-Fired Power Plants through Carbon Credits. 26 September 2023.

Figure 2: Components of Transition Credit Value



Source: IEEFA.

Initial reports that introduced the transition credits concept have categorized them as high-quality, differentiating them from existing mitigation credits.[19, 20, 21] The quality of these credits is guaranteed by careful project selection, a sound methodology for calculating emissions abated, and by the presence of reputable counterparties on both the issuer (sell-side) and buy-side. To ensure credibility, such transition credits must comply with recognized standards, such as the ICVCM's Core Carbon Principles (CCPs).[22] These standards are viewed as a global benchmark for high-integrity carbon credits that set rigorous disclosure and sustainable development thresholds. The ICVCM is an independent governance body that aims to establish and maintain ethics, sustainability, and transparency in the global voluntary carbon market.[23, 24]

The CCPs encompass concepts like 'additionality' (the premature closure would not have occurred without transition credits), 'supplementarity' (the usage of carbon offsets should be supplementary to and not a replacement of primary decarbonization efforts of an organization's carbon footprint), and 'longevity' (the source of avoided carbon remains unutilized for an extended period and sufficient precautions ensure no reversal of the projected carbon emission reductions).

The premature retirement of these fossil fuel projects presents substantial economic hurdles and extensive financing requirements. The MAS-McKinsey report equates the loss of a plant shutdown to

[19] Business Times. Singapore will buy credible carbon credits from coal plant closures. 2 December 2023.
[20] Rocky Mountain Institute. Transition Credits Are Gearing Up to Support Global Energy Transformation. 12 March 2024.
[21] MAS. MAS and McKinsey Explore the Use of High-integrity Carbon Credits to Accelerate and Scale the Early Retirement of Asia's Coal-fired Power Plants. 26 September 2023.
[22] ICVCM. The Core Carbon Principles.
[23] MSCI Inc. Potential Impact of the Core Carbon Principles on the Global Carbon Credit Market. 20 September 2023.
[24] MSCI Inc. ICVCM's Core Carbon Principles Narrow the Gap Between Idealism and Pragmatism. 28 July 2023.

roughly USD11-12 per metric tonne[25] of carbon dioxide equivalent ($MTCO_2e$) avoided, suggesting carbon credits could bridge this deficit.

Interest in carbon credits, of which transition credits are a subset, usually stems from business purchases for voluntary emission offsets and government procurements to propel domestic decarbonization.[26] Enterprises can utilize these credits to meet their mandatory carbon reduction goals in compliance markets, while governments can employ them to help achieve national targets in global transactions under Article 6 of the Paris Agreement.[27, 28]

Carbon credits may appeal to a broad range of buyers and investors, such as those wishing to invest in transition finance, putting resources into brown-to-green transitions, and requiring clean tech switching in a single investment. A second group would be those who invest solely in clean technologies and green financing. A third group could include lenders who can accelerate the energy transition by investing only in coal-powered generator retirement, providing resources to support funding or refinancing for the early shutdown. This group may include concessionary finance providers, debt investors, and equity investors with no-coal financing commitments.

Figure 3: Potential Uses of Transition Credits

Source: IEEFA.

[25] MAS & McKinsey. Accelerating the early retirement of coal-fired power plants through carbon credits. September 2023. Pages 16 and 18.
[26] Ministry of Sustainability and Environment, Government of Singapore. Singapore Sets Out Eligibility Criteria For International Carbon Credits Under The Carbon Tax Regime. 4 October 2023.
[27] UNFCC. Paris Agreement Crediting Mechanism.
[28] Carbon Direct. COP29 & Article 6.4: A new chapter in global carbon markets. 26 November 2024.

Valuation of Transition Credits

The transition credit mechanism relies fundamentally on appropriate pricing of avoided carbon emissions. Buyers would then pay a price that helps fill the financing gap, making a coal-to-clean project viable.

A report by the MAS provides an example of a typical Indonesian power station that would close five years earlier than scheduled with the help of transition credits.[29] The example works on an assumed economic gap of USD70 million (mn) for early shutdown and estimates that a transition credit price of USD11-12 per $MTCO_2e$ would address the difference.

A similar study of the Philippines' ACEN Energy Transition Mechanism (ETM) project[30] calculates the foregone cash flows from the renegotiated or canceled PPAs at USD48-75mn, thereby valuing the avoided emissions at USD16-25 per $MTCO_2e$. Furthermore, the battery cost for firming power would add another USD18-27 per $MTCO_2e$ saved.

A recent Indonesia-focused study by the Institute for Essential Services Reform (IESR) and CASE Indonesia compared the costs of early coal plant retirements with other options, such as operating the plant with carbon capture and storage (CCS) until its expected end of life.[31] Based on the results, a carbon price of USD25.2 per $MTCO_2e$ can be calculated as the cost of early closure.

Additionally, "just transition" and social costs associated with such projects are difficult to estimate since circumstances differ regarding direct and indirect livelihoods affected by a plant shutdown.

Significant research exists on what aspects need to be addressed for a just transition.[32, 33, 34] Allocating costs to different projects and adjudicating on the portion of fees to be borne by the project owner and by national social and labor programs is another critical issue.

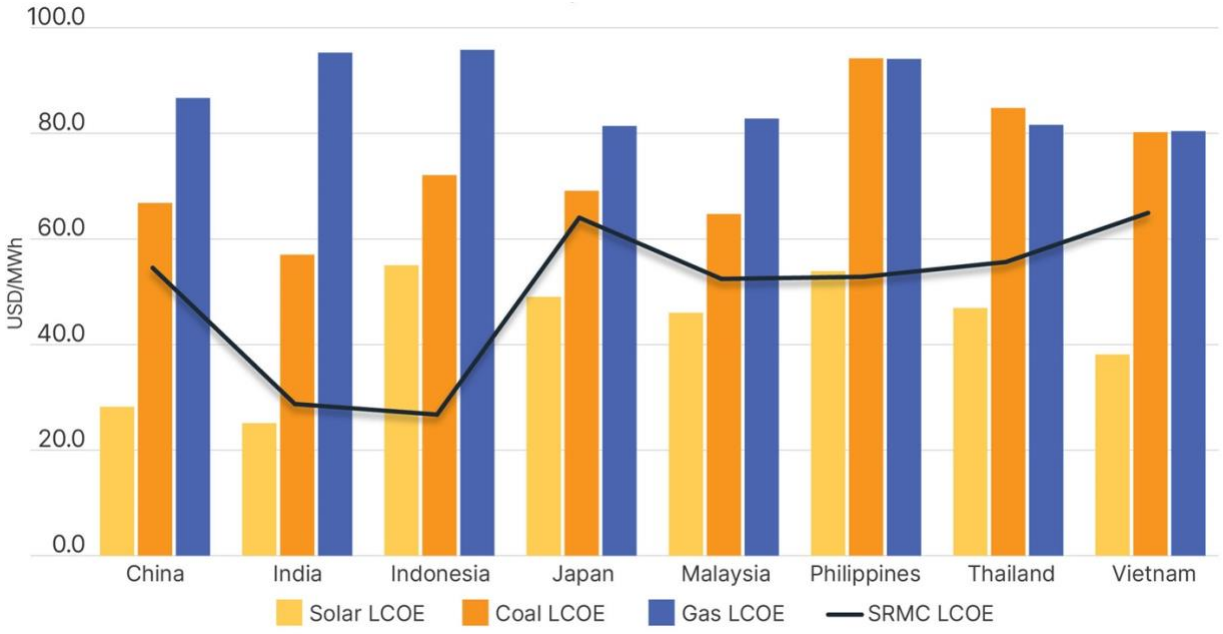
While the economics of coal plants differ due to varying expenses, recovery rates, capital costs, and PPAs, all expenditures must be considered when addressing the potential financing gap. A recent study by the Institute of Energy Economics and Financial Analysis (IEEFA)[35] found that the NPV foregone was typically 15-20% of the overall cost of a coal-to-clean transaction, while 70-80% of the

[29] MAS. MAS and McKinsey Explore the Use of High-integrity Carbon Credits to Accelerate and Scale the Early Retirement of Asia's Coal-fired Power Plants. 26 September 2023.
[30] London School of Economics. ACEN Renewables – using transition credits to accelerate coal closure - Grantham Research Institute on climate change and the environment. 11 December 2024.
[31] CASE Indonesia. Coal's Endgame: Cost-Benefit Analysis (CBA) of Early Retirement Coal-Fired Power Plant (CFPP) versus CFPP with Carbon Capture and Storage. 21 March 2024.
[32] Climate Policy. Transitional assistance policies for just, equitable and smooth low-carbon transitions: who, what and how?. 28 August 2019.
[33] Journal of Sustainable Finance and Investment. Just transition transaction in South Africa: an innovative way to finance accelerated phase out of coal and fund social justice. 3 September 2021.
[34] Climate Policy. The 1.5°C target and coal sector transition: at the limits of societal feasibility. 4 December 2017.
[35] IEEFA. Accelerating the coal-to-clean transition. 17 June 2024.

project cost was required for establishing alternate renewable power sources to offset the lost coal power generation and storage options.

With falling renewables investment and energy costs, the early shutdown of coal plants and their replacement with clean energy is increasingly economical. Considering this, some may argue that transition credits are not required. However, the pace of reductions in the levelized cost of energy (LCOE) from different renewable sources is not uniform across countries and geographies[36], nor is there an unchanging price for coal or gas. Figure 4 shows some LCOEs for coal, gas, and solar photovoltaic (PV) energy. For a majority of the countries, the argument can be made that new investments in clean energy can be sustainable and are more economically attractive than fossil fuel-based investments.[37]

Figure 4: Levelized Costs of Energy (LCOEs) and Short Run Marginal Costs (SRMCs)



Source: BNEF.

However, while the LCOE for a new fossil-based plant in some countries is uneconomical compared to that of a renewable project, the short-run marginal cost (SRMC) of an existing fossil-based plant may be lower. This is particularly true for older, almost fully depreciated CFPPs, where the near-term profitability setback in switching to clean energy may ensure the continued operation of the plant. A transition credit can be useful in such a situation to overcome the often achievable financing gap and accelerate the transition.

[36] Bloomberg New Energy Finance (BNEF). 2H 2023 LCOE Update: An Uneven Recovery. 18 December 2023.
[37] BNEF. Global Cost of Renewables to Continue Falling in 2025 as China Extends Manufacturing Lead. 6 February 2025.

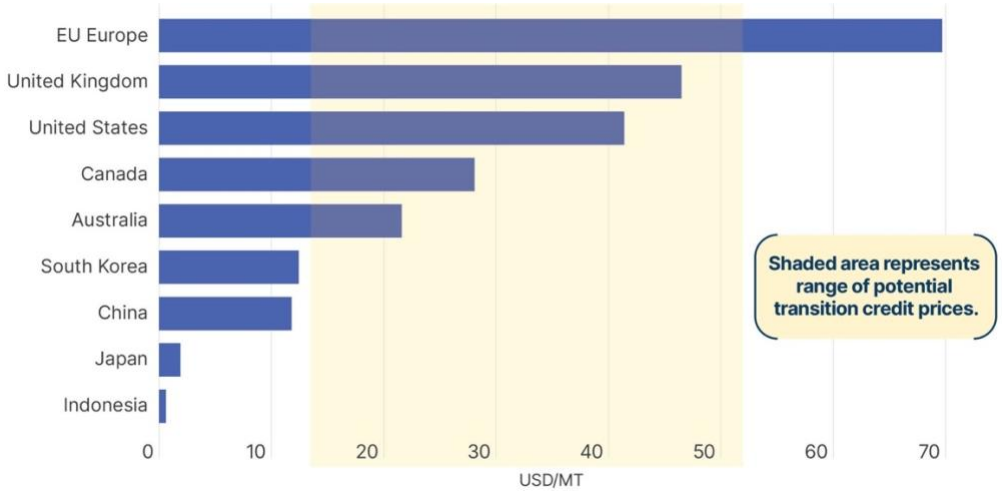
The LCOE for solar PV is lower than the fossil-based LCOEs for all countries (Figure 4). However, for Indonesia and the Philippines, the SRMC for coal is lower than the LCOE for new solar PV. In such instances, the difference between the SRMC and the renewable LCOE has to be addressed, and the transition credit can be used.

For example, Indonesia has an SRMC for coal of USD27 per megawatt-hour (MWh) and an LCOE of USD55 for solar PV, resulting in a difference of USD28 per MWh. This broadly aligns with the IESR and CASE Indonesia example cited earlier. Without considering any other costs and using IEA's estimates of 900 grams of carbon dioxide equivalent per kilowatt-hour (CO_2e/kWh) as the average Indonesian CFPP emission rate, this translates to a price of USD31 per $MTCO_2e$ to replace coal with equivalent new solar.

Consequently, there is a range of possible transition credit values from USD11-52 (it should be noted that the lowest and highest estimates appear to be outliers). Figure 5 compares these to the regulated official carbon market prices for carbon dioxide emissions in various countries. Carbon pricing is very low in Asian countries with some form of carbon pricing mechanisms (most do not have such schemes). Therefore, current carbon prices in many countries do not provide enough offset to enable a coal-to-clean shift. If successfully implemented, transition credits can establish realistic and credible benchmarks for overall carbon prices and spur the development of regional carbon markets.

Transition credits can be a logical instrument for raising additional finance for decarbonization in specific cases. However, there are some limitations. The replicability of the transaction may be more complicated than a generic methodology can provide. The price may vary depending on the unique source of the credit. Consequently, accuracy, verifiability, and credibility would be crucial.

Figure 5: Potential Transition Credit Issue Prices and Carbon Pricing (USD/MT)



Source: EU Emissions Trading System (EU ETS); UK Emission-Trading System; California US Carbon Market; Quebec Canada Cap-and-Trade System; Australia Safeguard Mechanism Baseline-and-Credit Scheme; South Korea Emission-Trading Scheme; China National Emissions Trading Scheme; Japan Tax for Climate Change Countermeasures; Indonesia Emissions-Trading Scheme.

The Limitations of Carbon Credits

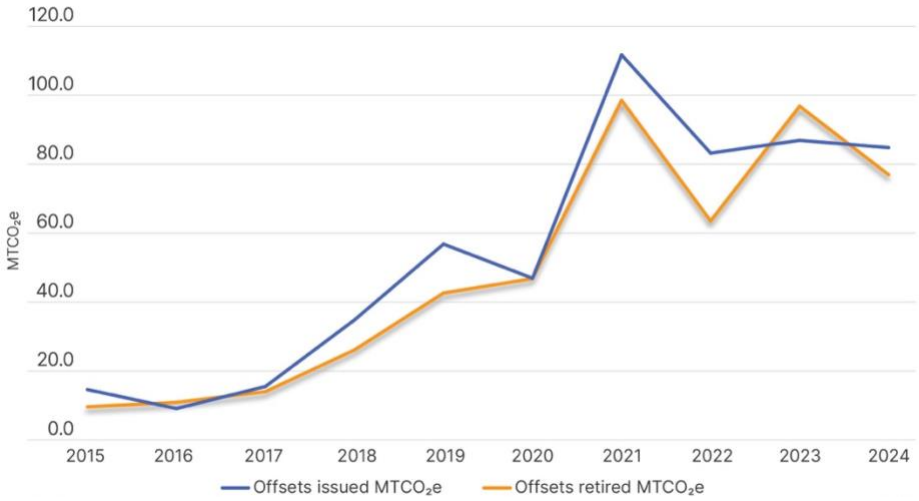
Carbon offsets and taxes require emitters to recompense for emissions by paying the government or entities that undertake activities to reduce, remove, or avoid carbon emissions. These financial instruments balance emissions by funding carbon reduction efforts. The government levies carbon taxes, while carbon offsets are voluntary.

The carbon credits landscape faces challenges threatening their effectiveness as a climate solution. Credibility is a core issue arising from problems in measurement, reporting, and verification. It suffers when offset project developers handpick verifiers and authenticators, raising the risk of lax scrutiny. This has sometimes resulted in issuing carbon offsets for undertakings that fail to reduce emissions.

The ripple effects extend beyond specific projects and impact the credibility of carbon markets, deterring potential participants and limiting the impact on climate alleviation efforts.

As these problems become more recognized[38, 39, 40], efforts are underway to enhance market credibility. A few verifiers under ICVCM's supervision are improving the rigor of standards while increasing transparency about how projects are evaluated and the benefits calculated.

Figure 6: Yearly Carbon Offset Supply and Demand



Source: IEEFA; Climate Action Reserve; BNEF; Verra.

A fundamental issue for VCMs is related to incentives. Over 90% of all carbon offset instruments are avoidance mechanisms regarding clean energy or afforestation[41], with the latter particularly affected

[38] Eco-business. Trust issues, lack of verifiable credits slowing investment in Singapore's carbon market: study. 13 September 2024.
[39] CSIS. What's Plaguing Voluntary Carbon Markets? 2 February 2024.
[40] The Australia Institute. The Problem with Carbon Credits and Offsets Explained. 23 February 2023.
[41] BNEF. Carbon Weekly. 13 March 2023.

by reliability issues. The current profit allocation model of carbon undertakings is also challenging. Some projects do not support local communities. Instead, they seem to be business enterprises.[42, 43, 44] The majority of profits are retained by developers and the offset buyers, leaving little incentive for local communities to alter practices.

Such arrangements jeopardize the long-term viability of these undertakings, as without adequate remuneration, local populations may withdraw their participation, rendering carbon extraction efforts unsustainable.

Therefore, a new focus on transparency in profit allocation is essential. Public awareness of fund distribution could foster accountability and ensure that those directly contributing to carbon extraction endeavors receive their fair share of financial support. This approach could also nurture lasting engagement from local communities, a critical factor in the success of carbon reduction initiatives.

Innovative solutions such as transition credits and energy transition mechanisms have potential. These approaches provide high-emission entities with a gradual pathway to reduce their carbon footprint, offering a nuanced strategy for carbon offsetting. However, these tools must be subject to rigorous authentication and transparent profit allocation to contribute to climate change mitigation. Concerted efforts to enhance authentication processes ensure equitable profit distribution, integrity, fairness, and transparency.

Addressing Credibility to Improve Transition Credits

Additionality

Under Article 6 of the Paris Agreement, “additionality” is defined as actions that consider all relevant national policies, such that mitigation from the project is beyond what is required by law and regulation. Additionality is the most pervasive concern around the quality of carbon offset credits. An “additional” project will likely need a higher carbon price to justify its investment, which could only happen with funding from carbon credits or other funding sources willing to accept a non-commercial rate of return on the investment. Emission removal projects (such as reforestation and direct air capture) have a strong case for additionality and are typically higher-cost options than emission avoidance projects (such as energy efficiency and avoided deforestation), which often have weaker additionality claims.

[42] SOMO – Centre for Research on Multinational Corporations. Carbon offsets often disenfranchise communities. 24 October 2024.
[43] Mongabay. How will we know when local communities benefit from carbon offset schemes?. 5 January 2024.
[44] Institute for Applied Ecology. Assessing the transparency and integrity of benefit sharing arrangements related to voluntary carbon market projects. November 2023.

Transition credits combine emission reduction or removal (from the closure of CFPPs) and avoided emissions through clean energy development. These credits would be most useful when there is a viability funding gap for a CFPP replacement project. The economic additionality condition is satisfied by a gap in financing - the larger the deficit, the higher the carbon or transition credit price needed. The funding necessary for projects targeted for transition credits is much lower than that required for early closure. Consequently, any targeted closures would likely be considered additional.

Look-ahead Risk

The second issue in evaluating "additionality" in transition credits is that it relies on forecasting an uncertain future. Creating a transition credit-based project assumes that the CFPP will not eventually be shut down by government action. The rationale for transition credit would be damaged if there was a strong likelihood that future laws or government measures would require the CFPP to shut down. To protect against this, the guidelines released so far expressly exclude CFPPs listed to be closed as part of the Just Energy Transition Partnership (JETP) and other government-sanctioned mechanisms.[45] Nevertheless, if a country such as Indonesia officially announces a coal exit plan by 2040 that involves shutting down all coal-fired plants, then that would put a time limit for CFPP operations to calculate emissions that an early shutdown would save.

Carbon Leakage

Another issue is “leakage” when projects displace emissions from one geographic area or activity to another. Leakage typically occurs in situations where resources are being protected. For example, a project that reduces timber harvesting may indirectly increase production elsewhere. Some protocols use rough assumptions to calculate the impact of leakage in credit calculations, leading to systematic over-crediting.

Leakage in transition credits would take place if coal unused in power generation due to early CFPP closure were to be sold in the market and eventually burned for other purposes. Safeguards are needed to account for this eventuality. Current carbon verification standards propose that 20% leakage should be assumed. This assumption is untested and complicated to verify unless a power plant is a coal mine-mouth plant. The coal used for power generation at the national level could be targeted, though it would be difficult to attribute increased coal usage elsewhere directly to a decrease from a CFPP closure.

The leakage problem is also closely related to the “permanence” issue, which ensures that the carbon credited by the offset remains permanently removed from the environment. However, with the coal still present in the mines, this cannot be completely guaranteed. Therefore, there is a risk

[45] MAS. The Transition Credits Coalition (TRACTION) Outlines Integrity, Scalability and Demand Considerations in Utilising Transition Credits to Accelerate the Early Retirement of Coal-fired Power Plants. 14 November 2024.

that the transition credit would consequently lose credibility and value. A third party, such as a government body or insurer, would likely be required to take responsibility.

Measurement and Verification Challenges and the Project versus System-level Debate

Organizations such as Verra, Gold Standard, and ICVCM are preparing methodologies to accurately measure decarbonization from the early closure of CFPPs. Multilateral lenders such as the ADB are also creating methods for the Measurement, Reporting, and Verification (MRV) of credits. IEEFA has provided input into many of these methodologies during the public comments period.

Most transition credit evaluation methodologies assume a project or plant-based scope instead of a national or system-wide framework. A transition credit may be awarded on the early retirement of a CFPP and replacement with clean power, independent of national regulation. Customized, deal-specific incentives or penalties are possible, such as discounts or haircuts for benefits and commitments from owners at the group level not to invest in other coal ventures. Such inducements are proposed to mitigate against the possibility of leakage.

Conversely, transition credits could also be designed for system or jurisdictional-level activities, including early CFPP retirement, clean energy replacement, and grid operation improvement, as part of a nationally approved strategy. System-level transition credits could be used to fulfill Nationally Determined Contributions (NDCs) rather than as a mechanism to bridge funding gaps.

System-level measures have the advantage of avoiding leakage that may result from individual early CFPP closures. However, they do not directly address or resolve the funding gap problem at the individual plant level, which is responsible for the slow progress in early retirement. Such measures need large-scale planning and coordination at the national and international levels. Credits at the project level are attempts to accelerate decarbonization using innovative finance at a micro or unit level rather than waiting for system-level initiatives and actions. Such credits are the most logical starting point to prove feasibility. With more experience and concept validation, national and system-level approaches may be considered.

Conclusion

Transition credits are proposed financial instruments that assign a monetary value to emissions avoided through the early closure of CFPPs and utilizing the credits for financing. The concept seeks to bridge the economic gap in accelerating the phase-out of coal power by creating a new category of carbon credits.

There is an economic challenge in shutting down viable CFPPs, with owners likely to seek compensation up to the NPV of foregone cash flows. The current value of a CFPP is the NPV of all its future cash flows, and early plant shutdown would require compensation for this lost value. The funding deficit created by early closure could be filled by carbon credits, with initial estimates ranging from USD11-12 to as high as USD52 per $MTCO_2e$. However, the valuation of transition credits would vary across countries and depend on the unique characteristics of each coal-fired plant, such as its age, location, PPA, and capital structure.

The concept of transition credits and their valuation face challenges. While these credits show promise as a financing tool, their replicability may be more complex than initially expected, and pricing may vary significantly based on individual project economics and local conditions. Social and "just transition" costs can also be difficult to estimate and allocate. Additionally, as renewable energy costs continue to fall, questions may arise about the additionality of transition credits in some cases. Despite these challenges, transition credits could establish more realistic benchmarks for carbon prices and stimulate market development in Asia, especially in countries where such pricing currently does not exist or is insufficient to drive the shift from coal to clean energy.

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About the Author

Ramnath N. Iyer

Ramnath is the Lead for Sustainable Finance at IEEFA. He has more than 30 years' experience in investments and finance, having worked with international banks and fund management firms in Singapore, Hong Kong, Mumbai, and London. His hands-on experience includes managing portfolios, conducting research, examining corporate strategy and integrating ESG and sustainability considerations into the investment and portfolio construction process. riyer@ieefa.org

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