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Early Retirement of Coal Power Plants through Voluntary Carbon Credits? The case of ACEN in the Philippines

by

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Early Retirement of Coal Power Plants through Voluntary Carbon Credits? The case of ACEN in the Philippines[1]

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Abstract:

This paper explores the possibility of using voluntary carbon credits to retire coal-fired power plants early. It introduces carbon emission trading using the example of the substantial European emissions trading market. It presents recommendations for phasing out coal power plants and discusses the challenges of calculating plant proprietors' losses and carbon emission savings. It also outlines the specific challenges of voluntary carbon credits and the need to monitor carbon credit deals. These issues are illustrated with the world's first Energy Transition Mechanism transaction for the early retirement of a coal plant owned by ACEN in the Philippines: the South Luzon Thermal Energy Corporation (SLTEC). It analyzes the financial transactions carried out by the power plant owner and the envisaged use of voluntary carbon credits. The paper concludes that there are many obstacles to moving beyond a few pilot projects.

Keywords: *energy transition, voluntary carbon credits, coal power plant, Philippines*

Coal power plants contribute significantly to carbon dioxide emissions. Therefore, retiring them early plays an important part in reducing emissions that harm the climate. However, phasing out coal power plants before the end of their commercial lifespan incurs substantial costs. Since constructing power plants requires significant capital, the revenue generated over their physical lifespan is necessary not only to cover labor and input costs, but also to recoup the initial outlay. It was calculated that retiring a typical power plant five years early would result in an economic loss of US$70 million per gigawatt (Monetary Authority of Singapore and McKinsey & Company, 2023). This calculation does not include the costs of dismantling the plant or cleaning up soil pollution. This raises the question of how to finance the early retirement of power plants.

Several financing models come to mind. From a "polluters pay" perspective, the coal plant owner should bear the costs, as they enjoyed the privilege of earning profits while polluting the air. From a market perspective, the burden should also be on the owner if alternative power sources can generate electricity at a lower cost. In a free market, a company that is no longer competitive must bear the losses. However, from a political science perspective, it seems unrealistic that owners of legacy power stations would accept bearing losses.[2] Given the importance of electricity generation for all production and consumption activities, these owners typically have considerable political influence. Blackouts are highly unpopular and can cost politicians elections. Therefore, literature on the early phase-out of fossil power plants focuses on how to compensate the owners of these plants.

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[1] A draft of this paper was presented in the two lectures I gave as an invited expert of the University of the Philippines World Expert Lecture Series (WELS) grant of Prof. Melisa R. Serrano, Dean of the University of the Philippines School of Labor and Industrial Relations (UP SOLAIR). The lectures were jointly organized by the UP SOLAIR and the UP School of Economics on 26-27 June 2025 at the School of Economics.

[2] In Spain and Portugal, market forces prompted owners to retire coal-fired power plants early. However, by that time, coal already played only a very minor role in the electricity generation of these two countries (Littlecott and Patuleia 2019).

Three compensation models are in practice or under discussion. The model initially practiced in Germany was funded by taxpayers; the government compensated utilities that own coal power plants (Scott et al. 2022).[3] However, this model is not well suited to countries in the capitalist periphery with limited public budgets. Therefore, the World Bank as well as Glasgow Financial Alliance for Net Zero proposes blended finance, which de-risks private lending by providing government guarantees (GFANZ 2023; World Bank 2023). Loans and government guarantees, however, add to the debt load of countries, which is already hardly sustainable in many countries of the capitalist periphery. The third model uses carbon credits to compensate power plant owners. If carbon credits are mandatory within a jurisdiction (e.g., a nation or a supranational entity like the European Union), the owners of polluting companies will bear the costs of the right to pollute. If they can pass these additional costs on to consumers, the consumers of their products will also bear the costs. So far, few countries in the capitalist periphery have established mandatory carbon credits (ICAP 2024). Among the exception is Singapore, which will be discussed in more detail below. In the absence of such mandatory carbon credit markets, some proponents are advocating for voluntary carbon credits.

This paper explores the possibility of using voluntary carbon credits to retire coal-fired power plants early by examining the case of the Filipino South Luzon Thermal Energy Company (SLTEC). According to the World Economic Forum, SLTEC's owner, ACEN, has started the "World's first Energy Transition Mechanism (ETM) transaction for early retirement of a Coal Plant". It may not be a coincidence that such a pilot project is starting in the Philippines. Its coal mining industry is minuscule compared to those of Indonesia and Vietnam (Huda 2025), so exiting coal-fired power plants will have less of an impact on its labor market.

The paper is informed by two published studies on SLTEC (Bhat et al., 2024; Nicholls, 2024) and feedback received by the author at a presentation in the Economics Department at the University of the Philippines Diliman in June 2025.[4] The paper expands on the two case studies by incorporating SLTEC into a broader discussion about financing the early phase-out of coal-fired power plants using voluntary international carbon credits. It begins with an introduction to carbon emission trading, highlighting the experience of the large European emission trading market. Next, it presents the recommendations of important financial networks for phasing out coal power plants, which guided the SLTEC pilot plan. The challenges of using these credits are discussed in four steps: (1) calculating the plant proprietors' losses, (2) measuring carbon emission savings, (3) the specific challenges of voluntary carbon credits, and (4) monitoring the carbon credit deal. The presentation of the SLTEC pilot plan is divided into two sections: one about the financial transactions carried out by the power plant owner, and another about the envisaged use of voluntary carbon credits to finance early retirement. In conclusion, while voluntary carbon credit markets are a potentially good source of financing the transition to renewable energy in capital-scarce countries, many obstacles exist to moving beyond a few pilot projects.

[3] Compensation ended with the last reverse auction in June 2023. Thereafter, the government ordered the exit of staggered amounts of capacity without compensation by 2026. At the same time, some coal plant capacity was scheduled to exit due to cost calculations (https://www.bundesnetzagentur.de/DE/Fachthemen/ElektrizitaetundGas/Kohleausstieg/GesetzlicheReduzierung/start.html).

[4] The author wants to express his thanks to the discussants for their insightful comments: Ruby B. De Guzman, Dir. III, Renewable Energy Management Bureau, Government of the Philippines; Matthew Carpio, Head of Transaction Advisory, Climate Smart Ventures; Atty. Gregorio Rafael Bueta, Climate and Sustainability Lawyer; Atty. Anne Montelibano, Pres., Philippine Independent Power Producers Association. For the moderation of the talk and incisive comments thanks go to Karl Robert Jandoc, Research Dir., UP School of Economics.

The market for international voluntary carbon credits

The purpose of carbon emission trading is to reduce carbon dioxide (CO_2) emissions by creating a market with limited emission allowances. While there is great variation among carbon markets, at their core, governments set quantitative limits on emissions produced by participating emitters. The largest of these markets is the European Union Emissions Trading System[5]. This system sets an upper limit on the total amount of CO_2 that polluters may emit each year. This cap will gradually decrease in order to reduce total permitted emissions to zero by 2050. Member states of the European Union allocate or auction the limited number of allowances (carbon credits). Each credit entitles the holder to emit one ton of CO_2 equivalent. By the end of the year, producers of CO_2 emissions must present credits equivalent to their emissions. If they exceed their allowance, they must purchase additional credits. Conversely, if polluters emit less than their allowance, they can sell their leftover credits.[6] This establishes a market for CO_2 credits (a tradable instrument, a virtual certificate).

Since the government allocates the credits, prices in the carbon markets depend heavily on government decisions. The speed of emission reduction is in their hands. Low free quotas and high prices for additional CO_2 emissions speed up the reduction of CO_2 emissions. Conversely, high free quotas and low prices will slow it down. Nevertheless, carbon markets represent a lower level of government intervention than limiting pollution and/or stipulating the technology used to reduce emissions through administrative means. Polluters can choose their carbon emission reduction technology and continue to pollute, albeit at higher costs, provided the number of carbon credits decreases over time and their price increases. This freedom should result in the most cost-effective methods of reducing emissions and reduce polluters' resistance to climate-mitigating policies. Additionally, proceeds from the weekly government auctions of carbon credits can fund climate change mitigation or compensate low-income households for higher energy prices. In Germany, for instance, all of the proceeds go into the Climate and Transformation Fund, which finances climate protection, energy efficiency, and renewable energy initiatives.[7]

European government auctions use a single-price procedure with one bidding round and a closed order book. In the second quarter of 2025, the German government auctioned around 16 million EU allowances, or credits, with a total value of approximately €1.12 billion, resulting in volume-weighted average proceeds of €69.40 per credit. In the secondary market, where polluters buy and sell carbon credits, prices fluctuated between -0.40% and +0.92% around the government auction prices.[8] The penalty for each ton of CO_2 emitted for which the operator has failed to surrender allowances was €100 in 2015 and increased annually based on the EU inflation rate.[9] Because the price of carbon credits never reached €100, the penalty has not yet been enforced.

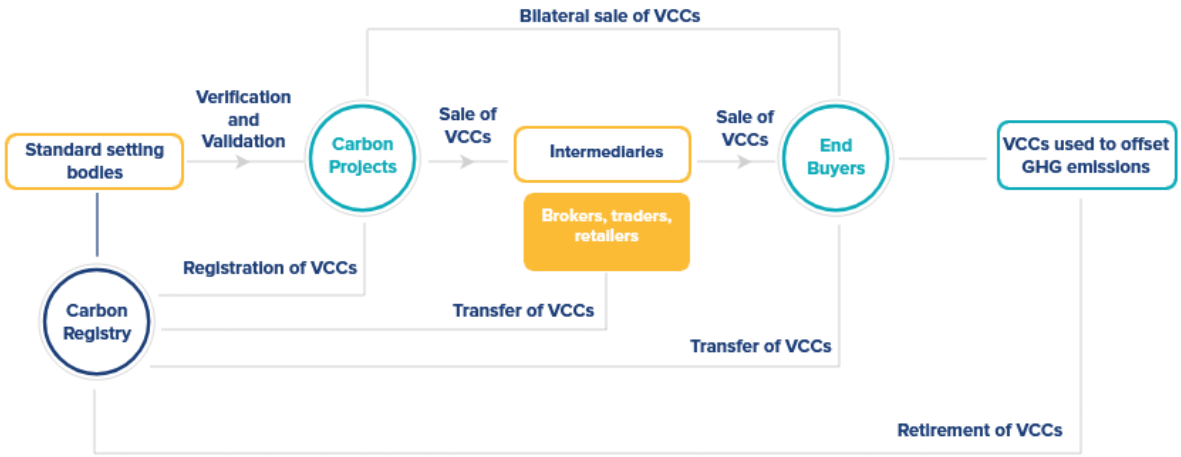
The European Union Emissions Trading System is mandatory for the energy sector, manufacturing and aircraft operators.[10] Nonetheless, prior to 2020, the participants of this system had the option to purchase carbon credits not only from their respective governments but also by investing in emission

[5] Includes also other greenhouse gases such as nitrous oxide. Since the article covers coal, the article focuses on CO_2.
[6] https://icapcarbonaction.com/en/ets/eu-emissions-trading-system-eu-ets
[7] https://www.umweltbundesamt.de/en/press/pressinformation/revenue-from-emissions-trading-once-again-at-record
[8] https://www.dehst.de/SharedDocs/downloads/DE/versteigerung/2025/2025_Bericht_Q2.pdf?__blob=publicationFile&v=5
[9] https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/monitoring-reporting-and-verification_en#penalty-for-excessive-emissions
[10] https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/scope-eu-ets_en

reduction measures outside the EU. These credits could then be used to fulfill their EU obligations. Companies could earn credits by financing projects that reduce or remove CO_2 emissions. This practice is called carbon offsetting. It is an attractive option when mandatory carbon credits are costly.[11] The EU has discontinued this offsetting possibility due to difficulties in verifying the effectiveness of purchased carbon credits (see below). However, offsetting is relevant to the case presented in this article because Singapore allows companies liable for carbon taxes to offset up to 5% of their taxable emissions with voluntary carbon credits. In 2019, it was the first country in Southeast Asia to implement a carbon tax.[12]

A company's motivation for voluntarily acquiring carbon credits rests not only on the possibility of offsetting, but also on reputational grounds. Some companies want to demonstrate their commitment to the climate without changing their business model. These motivations have given rise to voluntary carbon markets (figure 1), which promoters view as a means of financing climate mitigation projects, such as the early phaseout of coal-fired power plants (See, 2025; Bhattacharya et al. 2025).

Figure 1: Actors in the market for offsetting voluntary carbon credits



Legend: VCC = voluntary carbon credits; GHG = greenhouse gases

Source: https://www.hsfkramer.com/insights/key-topics/carbon-markets/explaining-voluntary-carbon-markets

The Glasgow Financial Alliance for Net Zero (GFANZ) has recommended the use of voluntary carbon credits specifically for the Asia-Pacific region. GFANZ's recommendations illustrate how carbon credits could facilitate the early retirement of coal power plants. These recommendations are presented here.

Recommendations for the phaseout of coal–fired power plants

The Glasgow Financial Alliance for Net Zero (GFANZ) is an independent, private-sector initiative that focuses on mobilizing capital and removing barriers to investment in the global transition. Its

[11] Another strategy to save costs for emission rights, is relocating industrial plants to non-European countries. https://climate.ec.europa.eu/eu-action/carbon-markets/eu-emissions-trading-system-eu-ets/free-allocation/carbon-leakage_en.
[12] https://www.nccs.gov.sg/singapores-climate-action/mitigation-efforts/carbontax/

members include AXA, Banco Santander, BlackRock, Deutsche Bank, UBS, and the Rockefeller Foundation. Ravi Menon, former Managing Director of the Monetary Authority of Singapore (MAS), heads the Regional Advisory Board of its Asia Pacific Network, and representatives of the Asian Development Bank (ADB) and the Asian Infrastructure Investment Bank (AIIB) are among the advisors (GFANZ website).

The GFANZ recommendation for financing early retirement includes reducing the cost of capital and generating an alternative cash flow. One way to reduce the cost of capital is through blended finance, such as refinancing a power plant that draws on public sources with lower refinancing costs. These sources could include national or multinational development banks, as well as philanthropic institutions. They can incentivize private-sector participation by conferring credibility and improving the bankability of the phase-out project.

The economics of early retirement would be supported by revenue streams that partially offset the loss of revenue from ceased energy production and sales. GFANZ recommends using carbon credits for this purpose. These credits would result from reduced CO_2 emissions after the coal power plant's early retirement date. These credits would be tradable on emission trading markets (GFANZ, 2023).

The challenges for voluntary carbon credits

Some view voluntary carbon credit markets as a fig leaf for corporations that use them to cover up their tepid actions at home regarding reducing their own greenhouse emissions (New Climate Institute 2023). Besides this fundamental critique, a number of studies have revealed systematic misrepresentation of the emissions saved by the funds generated by voluntary carbon credits (see below). While fraud cannot be disregarded, accounting for emissions saved and costs incurred by an early phaseout of coal-fired power plants faces severe challenges. These challenges will be described below.

Calculation of financial losses

The first challenge is to independently assess the losses incurred by the operator of a coal-fired power plant. To compensate for future losses, the date on which the plant is amortized is more important than the prospective technical lifespan of the plant. The depreciated sums are subtracted from the taxable income, meaning taxpayers have contributed to financing the construction of the power plant, i.e., the investor has already received public funding. Therefore, the question is to what extent the power plant is already amortized. An answer to this question requires knowledge of the previous depreciation schedule for the initial outlay for the power plant.

Another question pertains to future maintenance costs between the early retirement date and the original date. While past experience may be a guide, it is difficult to foresee the development of the costs of maintenance. In order to assess the value of the plant at its early retirement date, one would also need to know its competitive position compared to alternative energy sources on that date.

If alternative energy sources are more price competitive, the market value of coal-fired power plants will decrease. The extent to which this occurs depends on the model used to predict the future cost structure of alternative energy sources. Since the cost of these alternatives has decreased quite quickly and is already lower than that of coal-fired power plants (Kachi et al. 2024), it is likely that they will be able to supply electricity at significantly lower costs in a few years. This raises the question of how much the amount of carbon credits used to compensate power plant owners should reflect the reduced value of legacy plants.

According to GFANZ, the carbon credits should also contribute to the costs of investments in renewable energy sources. With some certainty the costs of current investments are known. Less certain is the cost recovery period. Its length depends on the price development in energy markets. Even less certain are the costs of investments at the date of the early retirement of the coal-fired power plant.

To sum it up, the calculation of the financial losses and investment needs for the owners of legacy power plants are fraught by many unknowns, especially for an independent assessment.

Calculation of emissions savings

The methodologies used to measure CO_2 savings have received a lot of criticism. 100 methodologies are covered by 15 carbon crediting standards (See 2025). Verra is a leading standard setter, yet its methodology has also been severely criticized. A nine-month investigation supported by major news organizations found that approximately 94% of the rainforest carbon credits certified by Verra did not amount to a ton of carbon dioxide equivalent (The Guardian, Die Zeit, and SourceMaterial, 2023). Further failings in the accurate verification of carbon credits were reported by Blake (2023), CCAG (2024), Coglianese and Giles (2025), Dufrasne (2023), Gill-Wiehl et al. (2024), Jackson and Tofighi-Niaki (2025), Kimeo (2025), Trencher et al. (2024).

Verra has responded with a revised methodology (Verra 2025; for an overview of the original draft, see Clough 2023). It is too early to assess the extent to which it improves upon previous practices (a skeptical view is presented by Jackson and Tofighi-Niaki 2025). Promoters of carbon credits are aware of the pitfalls of measuring future carbon dioxide emission savings (Bhattacharya et al. 2025). The National Environment Agency of Singapore has developed a list of requirements for valid methodologies. This list illustrates the complexity of the task (Table 1; for a critical assessment of these requirements, see Meitner 2024).

Table 1: Singapore's eligibility criteria for international carbon credits

Principle	**Definition**
To comply with Article 6 of the Paris Agreement, the certified emissions reductions or removals must have occurred between 1 January 2021 and 31 December 2030.	
Not double-counted	Certified emissions reductions or removals must not be counted more than once in contravention of the Paris Agreement.
Additional	Certified emissions reductions or removals must exceed any emissions reduction or removals required by any law or regulatory requirement of the host country that would otherwise have occurred in a conservative, business-as-usual scenario.
Real	Certified emissions reductions or removals must have been quantified based on a realistic, defensible and conservative estimate of the amount of emissions that would have occurred in a business-as-usual scenario, assuming the project or programme that generated the certified emission reductions or removals had not been carried out.
Quantified and verified	Certified emissions reductions or removals must have been calculated in a manner that is conservative and transparent, measured and verified by an accredited and independent third-party verification entity before the ICC was issued.

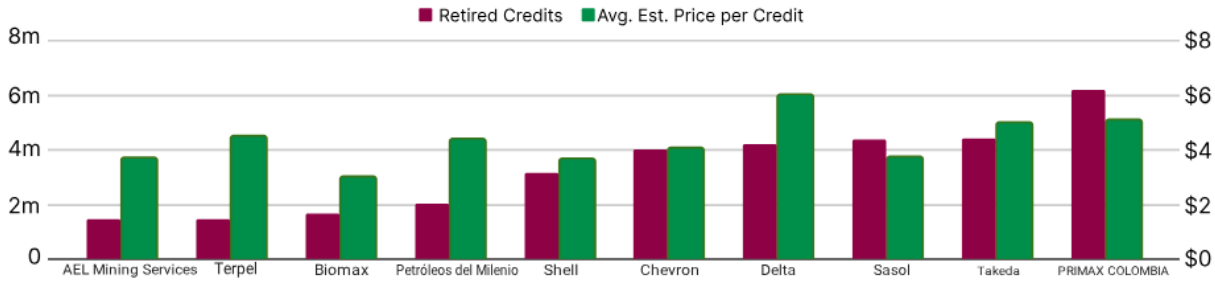
Permanent	Certified emissions reductions or removals must not be reversible, or if there is a risk that the certified emissions reductions or removals may be reversible, there must be measures in place to monitor, mitigate and compensate any material reversal of the certified emissions reductions or removals.
No net harm	The project or programme that generated the certified emissions reductions or removals must not violate any applicable laws, regulatory requirements or international obligations of the host country.
No leakage	The project or programme that generated the certified emissions reductions or removals must not result in a material increase in emissions elsewhere, or if there is a risk of a material increase in emissions elsewhere, there must be measures in place to monitor, mitigate and compensate any such material increase in emissions.

Source: National Environment Agency 2023

Price and volume of voluntary carbon credits

The utility of using carbon credits for the early phase out of legacy plant rests ultimately on the availability and price of these credits. So far, the average level of carbon pricing globally at US$5 per ton (across priced and unpriced emissions) is considered to be too low (Bhattacharya et al. 2025). Even the current carbon price in the mandatory European emission trading system does not reflect the societal cost of carbon emissions (Bucher-Koenen et al. 2025). In the voluntary carbon market, the price range was between $0.98 and $15.60 per ton of CO_2 equivalent from 2020 to 2023 (Trencher et al., 2024, p. 6), and the average price of carbon credits did not exceed $8 (Figures 2 and 3). In addition, the price proved to be very volatile.[13] For the long-term planning necessary to accomplish an early phase out, this volatility is detrimental.

Figure 2: Top all time buyers of compliance eligible credits by estimated average price per credit

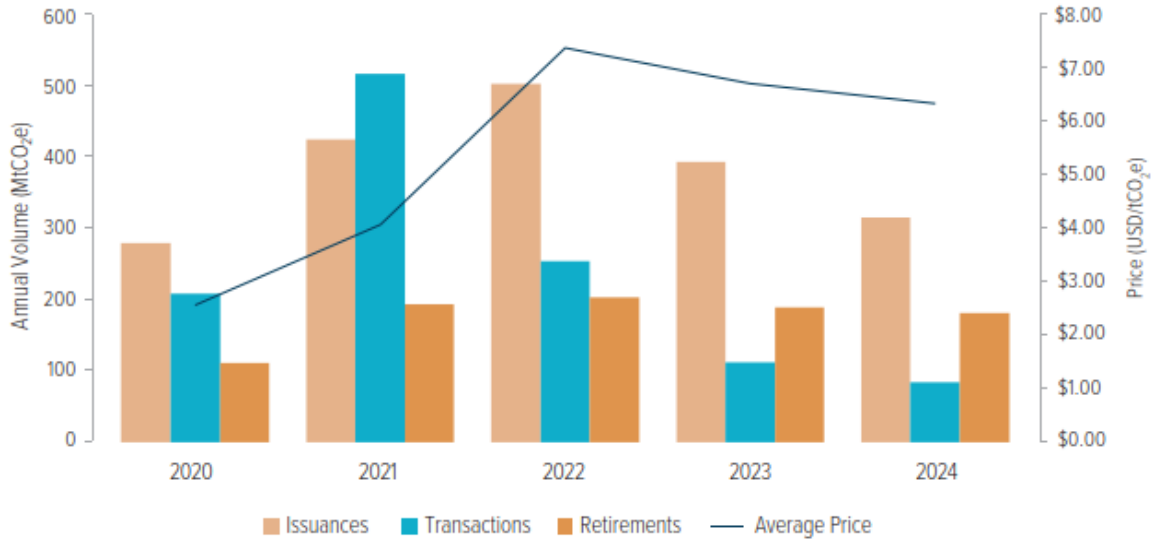


Legend: Taken from California ARB Offset Scheme, RGGI Offset Scheme, Chile Green Tax Emissions Compensation System, Mexico Querétaro Emission Carbon System

Source: AlliedOffsets 2024: 5

Figure 3: Overview of voluntary carbon market issuances, transactions, retirements, and average price, 2020-2024

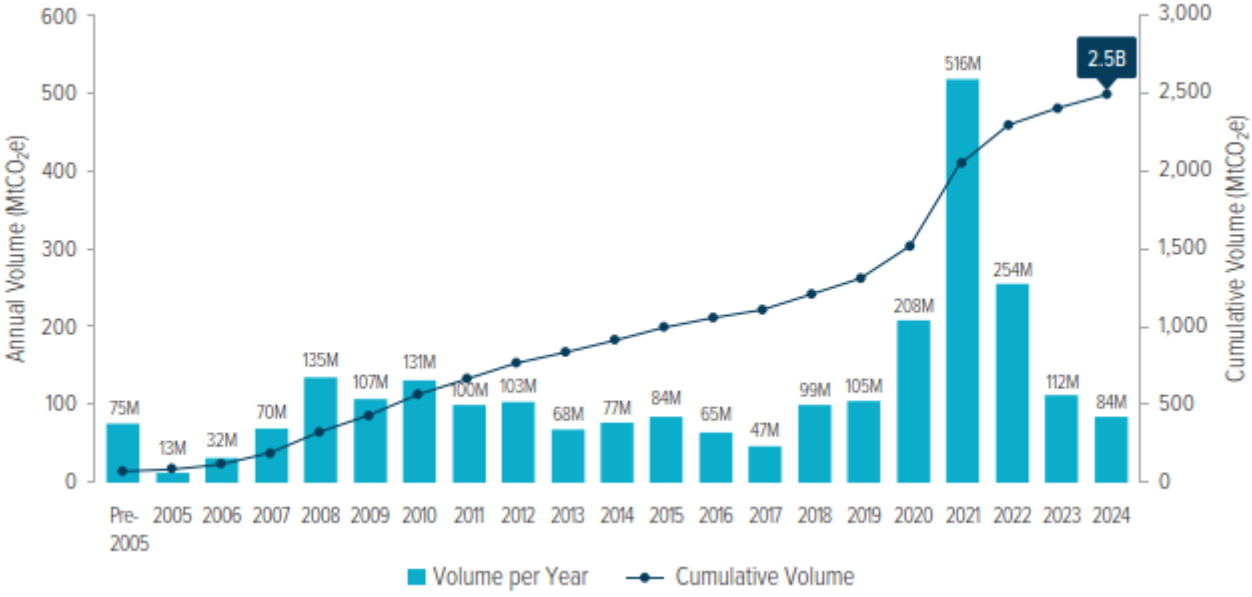
[13] https://focus.world-exchanges.org/articles/unveiling-price-dynamics-voluntary-carbon-market-trends-and-insights



Source: Forest Trends' Ecosystem Marketplace (2025: 6)

From its 2021 highs, the voluntary carbon market has shrunk considerably in 2024 (figure 4). The future recovery is doubtful in light of the campaign of US Pres. Donald Trump against ESG programs of companies (See 2025).

Figure 4: Voluntary carbon market size by volume of traded carbon credits, pre-2005 to 2024



Source: Forest Trends' Ecosystem Marketplace (2025: 7)

Monitoring the carbon credit deal

Once a phaseout project receives compensation through the sale of voluntary carbon credits, the question of who will monitor the transition to renewable energy arises. Verifying the key element of the plan to retire a plant early is quite straightforward. Has the plant been taken off the electrical grid? Have other plants increased their capacity utilization? Have any new coal-fired power plants

started operating in that grid? The greater challenge for verification is whether the coal plant has been replaced by renewable energy sources and whether the measures for a just transition have been carried out. The promoters of the transition projects are aware of this challenge. They therefore recommend financing the "just" part of the phaseout through other means, such as grants from philanthropic organizations. A Rockefeller Foundation paper in collaboration with South Pole and Verra stipulates that “The amount of funds allocated to implement the just transition plan must exceed 2% of the expected net revenues from the sales of VCUs”[14] (Rockefeller Foundation et al., 2025: 10).

Auditors are responsible for verifying the claims underlying the carbon credits, both before and after the credits are brought to market. However, project developers most commonly contract these auditors from a list provided by the registries. Coglianese and Giles present substantial evidence that all actors involved in the offset market "benefit from low-cost and plentiful carbon offsets so they can make more money, declare action on climate at a lower cost, or claim progress toward climate goals" (Coglianese & Giles, 2025, p. 11).

What happens if the conditions required to verify the voluntary carbon credits are not met after they are sold? For example, what if no retraining occurs, or worse, the plant is not taken off the grid? The literature promoting voluntary carbon credits mentions buffer pools. These pools are filled by sellers of credits and maintained by carbon credit registries. Credits from the pool are used to replace invalidated credits (https://verra.org/faq/). Critics point out that, as of May 2023, the pool contains only 6.3% of the total credits issued by Verra, which might not be sufficient. If the already-sold credits are invalidated, the extra credits given to the pool must also be invalidated. Furthermore, it cannot be ruled out that buffer credits from low-quality carbon emission reduction projects could replace credits from high-quality projects. Thus far, the size of the pool has lacked sound scientific analysis (MacDonald, 2022; Slater, 2023).

Can the purchaser sue the seller of the credits? It depends on the purchase agreement. A well-drafted contract specifies who is responsible for replacing invalid credits. Nevertheless, many unresolved legal issues have gained the attention of the International Institute for the Unification of Private Law (UNIDROIT), which has formed a working group to study the legal nature of voluntary carbon credits (UNIDROIT, 2024). The unclear liability in cases of misrepresentation or fraud makes many companies hesitant to purchase voluntary carbon credits.

The case of the South Luzon Thermal Energy Corporation

South Luzon Thermal Energy Corp. (SLTEC) was owned by ACEN Corporation, an energy company with assets totaling approximately €5 billion and gross revenues reaching €141 million in 2024, according to its annual report.[15] ACEN is a subsidiary of the Ayala Group, which describes itself as one of the largest conglomerates in the Philippines. Over the past decade, ACEN has grown to become a leading renewable energy platform in the Asia-Pacific region. According to its website, the company has approximately 7 GW of renewable energy capacity, including projects under construction and those committed to.

In its quest to become a major force in the renewable energy sector, ACEN has been working to divest SLTEC, a 246 MW coal-fired power plant located about 100 km south of Manila, for years. As financial institutions and investors have become hesitant to finance the coal industry, and as ESG investors

[14] VCU = Verified Carbon Units, represents a reduction or removal of one ton of CO2 equivalent.
[15] edge.pse.com.ph/openDiscViewer.do?edge_no=74400b8ff4b3cc6dec6e1601ccee8f59

have criticized simple divestment for not addressing ongoing emissions, ACEN has turned to the Asian Development Bank's (ADB) Energy Transition Mechanism (ETM). (Interview with ACEN's CEO Eric Francia[16]; Tadalan 2023). ACEN successfully completed the divestiture of the plant in November 2022. This followed the GFANZ recommendations of reducing the cost of capital and generating an alternative cash flow (GFANZ, 2023: 97-100).

The reduction in capital costs was achieved by placing SLTEC in a special purpose vehicle (SPV). ACEN's SLTEC shares were purchased for US$18M by ETM Philippines Holding Inc. (EPHI), a SPV comprised of financial investors.[17] Additional capital was provided by Insular Life Insurance (US$9M), which was affiliated with the Ayala Group Corporation until 1987, and the Philippine Government Service Insurance System (GSIS)(US$40M), a pension fund. The total amount provided was US$67 million. The SPV borrowed US$247 million from the Rizal Commercial Banking Corporation (RCBC), majority-owned by the Yuchengco Group of Companies (YGC), one of the largest conglomerates in Southeast Asia, and the Bank of the Philippine Islands (BPI), another Ayala subsidiary. GSIS's shares, i.e., the pension fund's shares, are preferred equity. They are in the mezzanine tranche, which sits between senior debt and other common equity. This slightly reduces the risks for the pension fund. Overall, the financial transaction increased the debt-to-capital ratio from 0.58 to 0.79, replacing higher-cost equity with lower-cost debt (Bhat et al. 2024). It lowered SLTEC's de facto cost of capital to under 8% (Nicholls 2024: 3).

ACEN, however, stays involved with SLTEC in two important ways:

- Securing demand for SLTEC output: ACEN has a power purchase agreement with SLTEC until 2040 and a power supply agreement with distribution utility Meralco until 2029, which can be extended.
- Operation and maintenance of SLTEC: ACEN has a contract to manage plant reliability, security, and employees until 2040. (Bhat et al. 2024)

ACEN's continued responsibility for operating the plant and selling its output complicates the measurement of losses incurred by the plant's early retirement. ACEN can potentially control the operating costs and output prices. Both factors influence not only the profitability of the plant, but also ACEN's profitability. In order to better gauge the potential losses for ACEN from its early retirement plan, the terms of the contract between ACEN and the new owners of SLTEC, as well as between ACEN and the energy distributor, would have to be made public.

Investors and lenders of EPHI (the new corporate shell of SLTEC) were shielded from criticism for funding a CO_2-emitting coal-fired power plant because of the plan to use the proceeds of the sale for investing in renewable energy projects and to retire SLTEC early (Interview Eric Francia).[18] ACEN used $184M to refinance debt and cover transaction fees. It earmarked the remaining $130M for reinvestment in the company's renewable energy projects. In December 2023, the Rockefeller Foundation's Coal to Clean Credit Initiative (CCCI) and the Monetary Authority of Singapore (MAS) announced their partnership with ACEN for a pilot project using transition carbon credits to finance the closing of SLTEC's coal-fired power plant and replace it with renewable energy.

The early retirement plan contained the following items:

- Retiring the coal power plant after 25 years of operation in 2040 (on average, such plants are retired after roughly 40 years; Edianto et al. 2023).

[16] https://issuu.com/charlton_media/docs/ap_q1_2023/s/18779027
[17] EPHI is a holding company under ACEN, allowing the original owners to retain a stake in the asset (XXX).
[18] https://issuu.com/charlton_media/docs/ap_q1_2023/s/18779027

- The option to retire the plant as early as 2030. ACEN has a call option contract to buy back the plant from the new SPV owners, potentially using proceeds from carbon financing.[19]
- Just transition
    - Personnel training and reskilling, as well as rotations to ACEN's renewable energy plants are envisioned. In 2023, there were around 195 workers hired directly by SLTEC and 210 contractor workers (Nicholls 2024: 4).
    - Community resilience: Prospectively, SLTEC will transition to newer, cleaner technology, thereby remaining a taxpayer and employer in the region. (ACEN website: https://www.acenrenewables.com/energy-transition-journey/etm/)

SLETC's carbon credit deal

ACEN's early SLTEC retirement is one of two pilot projects of the Transition Credits Coalition (TRACTION), sponsored by the Monetary Authority of Singapore (MAS). An initial assessment estimated that closing down SLTEC and replacing it with renewable sources by 2030 would save 1.9 million tCO_2 each year. To compensate for lost cash flows, ACEN estimated the annual earnings from SLTEC's power to be between US$48 and US$75 million, and the cost of replacement to be between US$300 and US$450 million. This equates to a price range of between US$34 and US$52 per ton of CO_2.

The Rockefeller Foundation financed a feasibility study by South Pole Carbon Asset Management in Zurich regarding credits for saved CO_2 emissions. Verra, a nonprofit standard-setter for voluntary carbon market projects, reviewed the draft methodology, "Accelerated Retirement of Coal-Fired Power Plants Using a Just Transition,"[20] and approved it under its Verified Carbon Standard Program in 2025.[21]

Since the voluntary carbon market has a poor reputation, ACEN cannot expect much corporate demand. As ACEN's CIO, Eric Francia, has pointed out, corporate buyers of carbon credits prefer "sourcing carbon offsets from within their own value chains. The challenge is that few Western companies have a manufacturing presence in the Philippines" (Nicholls, 2024, p. 7).

Therefore, cooperation with the Monetary Authority of Singapore is crucial. Singapore's five percent allowance for voluntary carbon offsets is estimated to amount to around 50 megatons of CO_2 equivalent of potential annual demand for carbon credits (Nicholls, 2024, p. 6). This is enough to cover the estimated 1.9 megatons of CO_2 savings for SLTEC. At S$25 (approx. US$20) per ton of CO_2, Singapore's carbon tax has not yet reached the price range estimated to be necessary for retiring SLTEC early, but it is scheduled to be raised to S$45 per ton of CO_2 in 2026 (National Climate Change Secretariat, 2025).

To be eligible for the offset allowance in Singapore, there must be an agreement between Singapore and the country where the CO_2 savings occur, in line with Article 6 of the Paris Agreement. In August 2024, a memorandum of understanding was signed by the Philippines and Singapore to work towards

[19] https://www.philstar.com/business/2022/10/26/2219260/acen-executes-deals-inlife-etm-energy-transition
[20] Verified Carbon Standard (2024) M0233 Accelerated retirement of coal-fired power plants using a just transition. Draft version 1.0
[21] https://www.keppel.com/media/mitsubishi-and-dga-join-acen-genzero-and-keppel-to-drive-energy-transition-with-transition-credits/

such an agreement.[22] The agreement must also demonstrate high environmental integrity according to the seven principles outlined by the National Climate Change Secretariat (2025).

As a further step to secure SLTEC's early retirement through carbon credits, also called transition credits, ACEN enlisted the Japanese Mitsubishi Corporation and its subsidiary, Diamond Generating Asia, Limited (DGA), to "evaluate the feasibility of leveraging Transition Credits [to] accelerate the early retirement of coal-fired power plants" (Eric Francia).[23] ACEN is also joined by GenZero, an investment platform company founded by the Singaporean state-owned multinational investment firm Temasek, as well as Keppel Ltd., a Singaporean global asset manager.[24]

Given the involvement of Singaporean financial actors in ACEN's retirement plans, it seems that Singapore is motivated to become the marketplace for trading voluntary carbon credits in Asia. In June 2025, Singapore joined Kenya and the United Kingdom in an effort "to inject investor confidence into the beleaguered voluntary carbon market (VCM), which has been shaken by credibility concerns in recent years" (See 2025.) For ACEN's plan, establishing such a market is crucial, as the company has yet to finalize its transition credits transaction. The finalization of the plan depends on "adequate demand at the right price" from buyers (Nicholls, 2024, citing CEO Francia).

For ACEN, the 5% voluntary offset in Singapore could be enough to cover its transition plan. The question is the price. A Singaporean polluter is incentivized to purchase an international voluntary carbon credit if its price is lower than the carbon tax per ton of CO_2 emitted. Furthermore, a discount must be factored in for the risk that the purchased carbon credit will not be accepted as an offset by the authorities, or that an NGO will question the purported positive effects of the project financed by the voluntary carbon credit. Due to the current low price of voluntary carbon credits, ACEN's carbon deal may not be realized in the near future.

Because of the long timeframe for phasing out coal plants and the uncertainty surrounding the price of voluntary carbon credits, polluters may hesitate to purchase them. Therefore, it is not surprising that ACEN has kept its options open. ACEN sold its stake in SLTEC at a price that allowed it to retire SLTEC's debt and obtain resources for new investments. Furthermore, ACEN received an operating and maintenance contract from the new owners that extends until 2040. It would be surprising if this contract were not profitable for ACEN. Should SLTEC become a stranded asset in the future for any reason, the primary risk lies with the investors in the a special purpose vehicle for SLTEC and a government pension fund. ACEN's owner, the Ayala Group, is among the lenders for SLTEC through its subsidiary and will therefore also bear some risks, albeit less than the equity owners.

The size of the voluntary carbon credit market is a pertinent question when scaling up the ACEN pilot project to the level necessary to mitigate climate change through the early retirement of coal-fired power plants in the Asia-Pacific region. Carbon credit markets would need to expand beyond Singapore. The European Union's carbon border adjustment mechanism incentivizes countries exporting to the EU to measure carbon dioxide emissions. While measurement is certainly a prerequisite for establishing carbon credit markets, it is not a sufficient condition. Given the current geopolitical trade uncertainties and backlash against climate protection measures, it cannot be ruled out that the EU carbon border adjustment mechanism will be eliminated or weakly enforced. If

[22] https://www.mti.gov.sg/Newsroom/Press-Releases/2024/08/Singapore-and-the-Philippines-sign-Memorandum-of-Understanding-to-collaborate
[23] ASiANPOWER 2025 ACEN taps more partners for energy shift of PH's 246 MW coal-fired plant (9.5.2025). https://asian-power.com/project/news/acen-taps-more-partners-energy-shift-phs-246-mw-coal-fired-plant
[24] ASiANPOWER 2025 ACEN taps more partners for energy shift of PH's 246 MW coal-fired plant (9.5.2025). https://asian-power.com/project/news/acen-taps-more-partners-energy-shift-phs-246-mw-coal-fired-plant

carbon taxes are imposed in more countries in this region, it remains to be seen whether they will follow Singapore's example and allow for voluntary carbon credit offsets.

Conclusion

For a lower middle-income country with limited public budget resources, such as the Philippines, letting foreign polluters pay for the early retirement of a coal-fired power plant is certainly attractive. However, the Ayala Group, which owns ACEN—the previous proprietor of SLTEC—seems to have ample financial resources. The terms of the coal-fired power plant sale appear to be quite favorable to ACEN. The risks of SLTEC becoming a stranded asset have largely been transferred to a government retirement fund. Given the current low prices for voluntary carbon credits, the envisaged retirement of the plant by 2030 seems quite remote. President Trump's anti-climate campaign does not bode well for higher prices, at least until the end of his administration in 2029.

Even if ACEN's pilot project is successful, scaling up its strategy of phasing out coal-fired power plants will be challenging. Asymmetric information regarding the financial losses incurred by an early phaseout, as well as the saved CO_2 emissions, constitutes a major hurdle for calculating the sums necessary to compensate the plant's owners and determine the amount of eligible carbon credits. Consequently, markets for international voluntary carbon credits are volatile and have low volume and price levels, as well as an overall lack of reputational standing.

In short, decarbonizing electricity generation cannot rely on international voluntary carbon credits. Other strategies must be pursued.

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