

Walking on hot coal:

Will Verra's coal transition
carbon credits deliver
for the climate?

December 2025



CARBON
MARKET
WATCH

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EXECUTIVE SUMMARY

Coal is the most carbon-intensive source of fossil fuel, responsible for 41% of global fuel emissions in 2023.¹ To tackle this problem, several proposals have emerged to retire coal-fired power plants early by generating carbon credits from these actions as a financial incentive.

However, such carbon crediting carries notable risks, which are discussed in detail in a companion [Carbon Market Watch briefing](#). Various initiatives are seeking to advance this concept through the development of methodologies - the frameworks that are intended to guarantee the environmental integrity and social equity of generated credits.

This briefing is based on research carried out by Oeko-Institut, funded by Carbon Market Watch.² Oeko-Institut systematically analysed the rigour of Verra's VM0052 methodology, 'Accelerated retirement of coal-fired power plants using a just transition'³ and its associated modules VMD0060 (combined baseline and additionality)⁴ and VMD0061 (just transition requirements),⁵ which collectively represents the most advanced VCM methodology attempting to generate carbon credits from the early retirement of coal-fired power plants.

In Carbon Market Watch's view, the results of this research demonstrate weaknesses in Verra's coal crediting methodology that could seriously undermine its ability to deliver credible, additional, and environmentally sound carbon credits.

The methodology establishes frameworks to quantify emission reductions from retiring coal plants earlier than their expected baseline lifetimes. Among other things, the methodology allows for several static assumptions and historical data, which carries the risk of not accurately reflecting the future context of a given coal plant, such as the date when it is assumed it would no longer be profitable (known as the financially attractive retirement date).

¹ [Our World in Data \(2024, January\): "CO₂ emissions by fuel"](#)

² Carbon Market Watch's briefing draws on research that we commissioned Oeko-Institut to carry out on Verra's coal crediting methodology (VM0052). The conclusions and recommendations in Carbon Market Watch's briefing are our own and do not necessarily reflect the views of Oeko-Institut.

³ [Verra \(2025, May 6\): VM0052: Accelerated Retirement of Coal-Fired Power Plants Using a Just Transition, v1.0.](#)

⁴ [Verra \(2025, May 6\): VMD0060: Combined Baseline and Additionality Assessment for Accelerated Retirement of Coal-fired Power Plants \(v1.0\).](#)

⁵ [Verra \(2025, May 6\): VMD0061: Just Transition Requirements for Accelerated Retirement of Coal-fired Power Plants \(v1.0\).](#)

The assessment identified multiple issues that, we find, demonstrate the methodology's shortcomings for environmental integrity (i.e. the quality of carbon credits):

- Significantly low renewable energy pairing requirements introduce a high risk of carbon leakage. This could allow most of the energy generation removed by coal plant closure to be replaced by fossil fuels, effectively shifting emissions elsewhere instead of leading to a reduction. The methodology requires 10% of lost power generation capacity to be annually replaced by paired renewables at the start of the project, rising to at least 40% by the end of the first crediting period, but this means that a potentially significant share of replaced energy capacity might not actually be renewable, representing a high risk of displaced emissions.
- The requirement to stop new coal power expansion applies to government utilities but not all private companies, introducing another leakage risk. This gap means other private developers (e.g. competitors) could still build or expand coal plants, negating the climate benefits achieved through closing existing ones.
- Rules for assessing the financially attractive retirement date of a coal plant are not robust enough, introducing overissuance and additionality risks. Additionally, there is no requirement to reassess key assumptions about the financially attractive retirement date during crediting period renewals, which risks misrepresenting the evolving conditions under which a plant might have closed earlier without the sale of carbon credits. The methodology also does not require a project-specific sensitivity analysis to test how and whether the financially attractive retirement date might shift under changing variables and assumptions.
- Relying on just two reference coal plants as a control group for baseline-setting introduces risks of adverse selection. The current rule could allow project developers to cherry-pick the most highly used coal plants in large grids, producing a counterfactual baseline that is unrepresentative of real grid conditions.
- Common practice analysis for additionality testing may be unsuitable for power grids with mostly young coal plants, like in the Philippines. A backwards-looking common practice assessment in such contexts would likely find zero historical retirements of coal plants, thereby determining a project will be additional despite there potentially already being commitments for other coal plants to retire in the future.
- There is a risk of double issuance due to inadequate safeguards. This means that both coal retirement projects and the renewable energy projects replacing its

capacity on the grid could claim credits for overlapping mitigation: this risk could arise among Verra-registered projects (e.g. a coal crediting project and a separate renewable energy project both under Verra) or between Verra and another carbon crediting standard.

Verra's methodology considers just transition elements, including the impact on coal plant workers and local communities dependent on plants for their livelihood, provisions for worker retraining, community support, and alternative economic opportunities to mitigate the impact of early plant retirement. However, the provisions should be strengthened to ensure the transition is genuinely fair for affected workers and communities. For example:

- The 2% benefit-sharing rule is unreliable because it is based on *net* rather than *gross* revenue, allowing developers the flexibility to potentially report lower profits and thus share less revenue from the sale of credits with affected stakeholders.
- Severance package provisions could be inadequate for coal plant retirements in countries with weaker economies, where compensation levels are often too low to provide adequate support for displaced workers or their families during the transition period.
- Conflicts of interest could materialise for mediation since project developers are able to select their preferred mediator should disagreements emerge between them and other stakeholders. This risks potential bias since the selected mediator may be more aligned with the developer's interests than the other affected stakeholders.

The methodology should require provisions for equity and accountability in the design, monitoring and implementation of benefit-sharing mechanisms,⁶ as well as ensuring that stakeholder conflict resolution processes are inclusive, transparent, and continuous.

Overall, in Carbon Market Watch's view, Verra's VM0052 carbon crediting methodology for the early retirement of coal plants lacks the caution, clarity, and safeguards necessary for guaranteeing real and verifiable emission reductions, and should be put on hold. The methodology should not be used in its current form to issue carbon credits and requires significant revisions before it might even be potentially re-considered. The methodology would benefit from clearer and stronger rules to ensure that the closure of coal-fired power plants is both environmentally sound and socially fair to all those

⁶ Carbon Market Watch (2023): [A fair share of the voluntary carbon market?](#)

affected. It should incorporate good practices from elsewhere in the market, such as the rules on baseline-setting (downward adjustment) and leakage from the Paris Agreement Crediting Mechanism.⁷

More fundamentally though, Carbon Market Watch has significant doubts whether such a methodology can ever be truly safeguarded against the significant uncertainties inherent in critical counterfactual assumptions and estimates concerning the early retirement of coal plants. These non-negligible risks are all the more concerning considering the massive volume of carbon credits that can be generated, which are likely to be used erroneously for offsetting purposes by companies and perhaps even countries under the Paris Agreement.

We consider that the issues identified in Oeko-Institut's research make the methodology significantly flawed. CMW does not find current coal crediting approaches to be credible enough and also has significant doubts about whether carbon credits are even an effective -- let alone the best -- approach for closing coal plants earlier. Legislative and regulatory frameworks have to be strengthened to ensure the timely retirement of coal infrastructure in the power sector, while ensuring the swift and fair deployment of renewable energy projects.

⁷ [United Nations Framework Convention on Climate Change \(2025\): Article 6.4 Supervisory Body: Rules and Regulations.](#)



Assessment of Verra's VM0052 coal crediting methodology

The extensive research carried out by the Oeko-Institut, and funded by Carbon Market Watch, investigates the VM0052 methodology 'Accelerated retirement of coal-fired power plants using a just transition'⁸ and its associated modules VMD0060 (combined baseline and additionality)⁹ and VMD0061 (just transition requirements).¹⁰

The work responds to growing interest in 'coal-to-clean credits', also known as 'transition carbon credits' (for the purpose of this report, these carbon credits will be referred to as "coal transition credits"). In this context, it is essential to understand whether claimed climate and social outcomes from the generation of such credits are credible.

Oeko-Institut's study focused on multiple dimensions of the quantification of climate and social benefits from Verra's VM0052 methodology and associated modules, specifically: additionality, quantification of emission reductions (baseline-setting), leakage, double counting and just transition principles.

The assessment tests these key criteria against the Core Carbon Principles (CCPs) of the Integrity Council for the Voluntary Carbon Market (ICVCM),¹¹ the methodological requirements of the Paris Agreement Crediting Mechanism (PACM)¹² and the assessment methodology of the Carbon Credit Quality Initiative (CCQI).¹³ Additionally, the approach to the just transition was also assessed.

Additionally, the assessment considered a regional focus on the Philippines, where coal remains a central pillar of the energy system. In 2024 it accounted for 62.5% of total

⁸ [Verra \(2025, May 6\): VM0052: Accelerated Retirement of Coal-fired Power Plants Using a Just Transition, v1.0.](#)

⁹ [Verra. \(2025, May 6\). VMD0060: Combined Baseline and Additionality Assessment for Accelerated Retirement of Coal-fired Power Plants \(v1.0\).](#)

¹⁰ [Verra. \(2025, May 6\). VMD0061: Just Transition Requirements for Accelerated Retirement of Coal-fired Power Plants \(v1.0\).](#)

¹¹ [Integrity Council for the Voluntary Carbon Market. \(2024, January\). Core Carbon Principles, Assessment Framework and Assessment Procedure \(Version 1.1\).](#)

¹² [United Nations Framework Convention on Climate Change \(2025\): Article 6.4 Supervisory Body: Rules and Regulations.](#)

¹³ [Carbon Credit Quality Initiative \(EDF, WWF-US, Oeko-Institut\) \(2022, May 31\): Methodology for assessing the quality of carbon credits, version 3, 31 May 2022.](#)

Note: Oeko-Institut is one of the founding partners, and leads the methodological development and assessment work for the Carbon Credit Quality Initiative (CCQI).

gross power generation,¹⁴ whereas renewables accounted for 22.2%. The current average age of coal power plants in the Philippines is 12 years, and in 2020 the government announced a moratorium on the construction of new coal plants¹⁵ signalling a strategic pivot toward cleaner energy sources and an effort to gradually shift the national power mix away from coal dependence. Specifically, Oeko-Institut's assessment analysed the South Luzon Thermal Energy Corporation (SLTEC) coal-fired power plant pilot project in the Philippines, the only project currently being developed under the VM0052 methodology, which aims to retire the plant a decade earlier, from 2040 to 2030.¹⁶ The SLTEC pilot helps to contextualise how the methodology will operate in practice and to identify real case challenges in implementation.

The SLTEC case study from the Philippines demonstrates risks that the carbon credits may not represent the mitigation outcomes they claim to. The core problem is that another coal power plant could be built in the same city or region. Although the early retirement of the SLTEC project could, in theory, be replaced with a 100% solar-based facility with storage, the benefits could effectively be cancelled out at the national level if another independent power producer proceeds to construct a new coal plant. This dynamic creates a clear moral hazard and a significant risk for the climate, illustrating why eligibility for such crediting projects should be limited to countries that have committed to a full coal moratorium.

Overall, Carbon Market Watch finds that Verra's approach to coal crediting falls well short of what is needed to guarantee an equitable and reliable climate and social impact. We are not convinced the methodology adequately upholds key quality criteria, especially on leakage, but also concerning baseline-setting, additionality, double issuance and the just transition. It also falls short of implementing criteria set out in CCQI to follow more rigorous crediting period duration and reassessment demands applied by other VCM standards.

In the spirit of constructive engagement, this briefing provides targeted recommendations to improve the VM0052 methodology. However, even following any major revisions and improvements, Carbon Market Watch remains very concerned that the methodology's inherent risks, uncertainties and assumptions make coal crediting too prone to error, manipulation, and overissuance to be considered trustworthy. We urge the ICVCM to carefully consider if this methodology actually meets the quality

¹⁴ Department of Energy (Philippines) (2025): *2024 Power Statistics – Summary (Philippines)*.

¹⁵ Department of Energy (Philippines). (2020, December 22): *Advisory on the Moratorium of Endorsements for Greenfield Coal-Fired Power Projects in Line with Improving the Sustainability of the Philippines' Electric Power Industry*

¹⁶ The Rockefeller Foundation (2024): "ACEN and Rockefeller Foundation Pilot Could Avoid up to 19 Million Tons of CO₂ via Carbon Financing." April 17, 2024.

benchmarks set under their Core Carbon Principles assessment framework, with which we do not think it complies.

Further details of the risks that could compromise the credibility of - yet to be - issued credits under this project type are explored below in this briefing. [Oeko-Institut's own full assessment of the methodology can be found in their research paper.](#)



Additionality

Additionality is the fundamental principle that a project's emission reductions or removals would not have occurred without the financial incentives provided by carbon credits as well as a regulatory requirement. In the context of coal transition credits, this means the early retirement or reduced operation of a coal-fired power plant must be directly enabled by the sale of these credits and not only to satisfy a regulatory mandate.

In general, several factors may undermine additionality for this project type:

- Pre-existing requirements: If a plant's closure is already mandated by law or government phase-out plans, or if its contracts – e.g. power purchase agreement (PPA) between the coal plant owner and an off-taker (off-takers are the entities that agree to purchase power from a coal plant) – naturally expire without renewal, then the shutdown of the coal plant is unlikely to be considered additional.
- Market conditions: If market forces, such as falling renewable energy costs, high coal prices, or a lack of funds, make the plant's operation unviable, revenues from the sale of carbon credits may not be truly necessary.

In relation to Verra's methodology, a project must demonstrate that it meets the requirements outlined in the VCS Module VMD0060 "Combined Baseline and Additionality Assessment for Accelerated Retirement of Coal-Fired Power Plants".¹⁷

¹⁷ [Verra. \(2025, May 6\). VMD0060: Combined Baseline and Additionality Assessment for Accelerated Retirement of Coal-fired Power Plants \(v1.0\).](#)

KEY FINDINGS

1/● Poorly defined common practice criteria could enable gaming

In addition to tests for regulatory additionality and investment comparison, the methodology requires a common practice test, which is intended to assess the likelihood of whether the coal plant closures happen without the finance from carbon credits. However, the test is weakened by poorly defined terminology: for example, the vagueness of terms such as “essential distinctions” could open the door to potential gaming.

In this case, the project developer can justify why the project region differs from the rest of the country by demonstrating region-specific factors that influence project feasibility. Specifically, factors might include local policies or subsidies, energy demand, fuel costs, infrastructure developments, market dynamics and economic components.¹⁸

The problem is that because the term “essential distinctions” is loosely defined, project developers can interpret it however they like. Such ambiguity could allow developers room to manipulate comparisons and bypass concerns revealed by quantitative testing, a flaw that also plagued the Clean Development Mechanism (CDM) and was therefore not included in the Paris Agreement Crediting Mechanism (PACM).¹⁹

2/● Backwards-looking common practice analysis may be unsuitable for contexts with young coal plant fleets

The requirement by the methodology to identify coal plants retired in the last 10 years may not be well suited for countries with relatively young coal fleets (e.g. Philippines). A backwards-looking assessment in such contexts would likely find zero historic retirements of coal plants, thereby determining a project will be additional, but which fails to account for commitments to bring retirement dates forward in the future. For example, in the Philippines, even if the past decade shows no retirements, a unit has already been approved for closure on these grounds suggesting the likelihood that others may follow.²⁰ This demonstrates that a backwards-looking only check can be misleading.

¹⁸ [Verra. \(2024, October 14\). VCS Tool VT0009: Combined Baseline and Additionality Assessment, v1.0. Verified Carbon Standard Program.](#)

¹⁹ [UNFCCC \(2023\): Standard: Article 6.4 Activity Standard for Projects \(A6.4-STAN-AC-002, Version 01.0\).](#)

²⁰ [Manila Standard. \(2024, July 26\). PSALM begins Mindanao coal plant's retirement, repurposing.](#)

Recommendations

- **Apply PACM common practice analysis:** The VCS should apply the Paris Agreement's Crediting Mechanism (PACM) common practice analysis to demonstrate additionality under the VMD0060 module once it is available. Unlike the current VCS approach, the PACM's common practice analysis does not include the vague concept of "essential distinctions." By removing this term, the VCS would remove ambiguity and provide a clearer and more objective assessment of whether an activity is truly common or uncommon.
- **Adopt forward looking assessment criteria:** The methodology should complement its backward-looking approach with forward-looking assessments that consider future retirement plans, policy commitments, and market trends. This would provide greater accuracy in assessing common practice, especially in countries with young coal fleets like the Philippines where there have been no retirements yet, but where they are expected in the future.



Baseline setting

To estimate the avoided emissions from the early closure of a coal-fired power plant, and subsequently the number of carbon credits that can be issued, the baseline represents the scenario in which the plant would not have closed early. Two key factors determine the total volume of emission reductions for this project type: the length of the crediting period (how long the project can issue credits) and the estimated baseline emissions (the assumed emissions that would have resulted from continued electricity generation without early retirement).

Establishing a conservative and accurate baseline requires considering multiple factors, including the plant's expected operating lifetime, fuel use, efficiency, and projected electricity generation.

Determining the baseline retirement date

Under the VMD0060 module, the earliest baseline retirement date is determined based on different scenarios. For example, this can include: the mandated phase out date by government regulations or national commitments, a plant's actual end-of-life determined by technical limitations, the date its current long-term power purchase agreement expires, a formally announced, financially closed retirement date under a coal transition mechanism, or the financially attractive retirement date which is the earliest year when it becomes more profitable to shut down the coal plant and replace it with renewable energy.

Specifically, the last scenario concerning the financially attractive retirement date is very complex and prone to error since it involves estimating the financial value of a coal plant is now by making assumptions about future factors: specifically, the continued operation of the coal plant compared to the early retirement of the coal plant and its replacement with renewable energy. In simple terms, the financially attractive baseline retirement date is then the year in which retirement of a coal plant and replacement of power capacity with renewable energy becomes equivalent or lower than under a scenario for continued operation.

KEY FINDINGS

1/• Uncertainty in future electricity generation and cost

Verra includes provisions for assessing the date when the early closure of a coal power plant is estimated to be more profitable than continuing operations (i.e. the costs outweigh the amount of money they can generate from selling electricity), which is known as the financially attractive retirement date.

Verra's methodology applies static measurements for both power generation and electricity prices across the entire financial assessment period, to determine the financially attractive retirement date. This provision is designed to prevent project developers from selectively choosing favourable assumptions, although it relies heavily on fixed projections for the future which may not be realistic.

While using standardised inputs does help limit subjective cherry-picking, because developers cannot choose assumptions that make early retirement appear more additional than it truly is, this safeguard comes at the cost of accuracy in markets where generation levels, dispatch patterns, and electricity prices are expected to change significantly. These factors will almost certainly shift over time, making today's fixed

assumptions a poor predictor of future conditions and introducing substantial uncertainty. Although the methodology tries to account for this uncertainty by deducting one year from the calculated baseline retirement date (simply meaning the methodology moves the expected retirement date one year earlier), this adjustment is minor and does not meaningfully address the deeper limitations of relying on static assumptions.

As more renewable energy and less carbon intensive fuel alternatives become cheaper and go online, the electricity a power plant generates naturally declines. Coal plants are therefore expected to operate less and sell electricity at lower prices, as they become less profitable or even potentially no longer economically viable.

Ignoring these changes provides an unrealistic picture of the future energy mix. This in turn can make early retirement of a coal plant seem more expensive than it would actually be and can consequently lead to an overestimation of the emission reductions claimed by the project.

2/• Lack of provisions for planning replacement energy sources for the grid

Under methodological requirements, project developers are required to calculate the replacement energy for coal plant energy and create a pairing plan which is a list of all the renewable energy sources which will be replacing that plant's energy. The methodology assumes that project developers will secure enough renewable energy to cover the full power generation lost from the coal plant being retired. However there are no provisions to check whether this replacement actually materialises.

Moreover, although the methodology requires the project developer to source replacement energy for the lost capacity, it does not require monitoring to demonstrate how this has been achieved for the share of energy that isn't derived from paired renewable energy. While this may be complex to demonstrate for various reasons, in practice it means that the project developer can procure part of the replacement capacity from fossil energy sources. If the displaced generation is replaced by other fossil fuel plants instead of low-carbon sources, the expected emission reductions may not materialise as expected.

3/• The baseline reassessment procedure problematically excludes key assumptions that introduce additionality and overissuance risks

Under the carbon crediting framework, the baseline retirement date represents the year in which coal plants would be expected to close in the absence of the transition credits project. This date is central to determining the project's emissions reduction

potential. The crediting period defines the length of time a project may issue credits, after which a crediting period renewal may occur. At each renewal, key baseline assumptions are typically reviewed to ensure they remain realistic and up to date.

Under the current version 4.7 of the VCS Standard, it explicitly requires that projects reassess baseline assumptions, which would include the baseline retirement date, at each crediting period renewal. The VM0052 methodology requires aspects of the baseline retirement date to be reevaluated at the crediting period renewal, such as the country-level coal exit scenario, but it does not require the reassessment of the financially attractive baseline date. This presents a real risk, since this date relies on multiple assumptions that are likely to change over time, as detailed previously. Excluding this from the baseline reassessment is a real limitation, since failing to update the estimated baseline retirement date over time reduces conservativeness and risks misrepresenting the evolving conditions under which the plant might have been retired without the sale of carbon credits.

Since the current version (4.7) of the VCS Standard allows a fixed 10-year crediting period or a seven year period renewable twice (up to 21 years), this gap could result in long intervals before any reassessment of the baseline occurs. That means credits could continue to be generated even if new energy policies or market developments make coal plant closures likely, even without the assumed influence of a crediting project.

Under the new version 5 of the VCS standard (expected to be released by the end of 2025 and was under consultation until the end of 11th of August 2025),²¹ proposed rule changes would shorten the crediting period for projects that are not land-based (such as coal crediting) to five years, renewable four times, and eliminate the 10-year fixed crediting period entirely. If implemented, these changes would reduce the likelihood of misalignment between the wider standard rules and the methodology's requirements since the renewal would be more frequent, and could better account for shifting dynamics like new renewable incentives, carbon pricing, or declining costs of clean energy.

²¹ [Verra \(2025, June\): Verra Launches Final Consultation on Version 5 of the VCS Program.](#)

Estimating baseline emissions

An emission factor refers to the estimated quantity of a pollutant released into the atmosphere per unit of an activity. In the context of coal-fired power plants, it indicates how much CO₂ is emitted for each unit of electricity produced, typically expressed in tonnes of CO₂ per megawatt-hour (tCO₂/MWh).

The emission factor of a coal plant depends on several variables. For example, the type and quality of coal being burned, the efficiency of the power plant, and the technology it uses. It can also change with maintenance, fuel changes, or operating conditions. Because these factors are dynamic and vary over time, emission factors need to be regularly updated to make sure emission reductions and baselines are calculated accurately.

KEY FINDINGS

1/• **Conservative use of historical data reduces bias but does not reflect future conditions**

The methodology employs certain conservative factors to predict future trends in electricity generation based on historical data. For example, project developers must use the lowest historical utilisation factor (how much a coal power plant is actually used) from different reference regions. This helps prevent cherry picking of favourable data that could inflate emission reductions, which has been problematic in other project types like REDD+.²²

When no reliable reference data is available, the methodology requires using a default assumption that a plant's output will steadily decline over its remaining technical life. This default is intended to help account for uncertainty, including some of the effects of climate and energy policies that may reduce coal use over time.

However, even with these measures being considered, relying primarily on historical data will always have some uncertainty and limitations in a fast-changing policy and market environments. For instance, new energy policies introduced in the Philippines in 2024²³ are expected to accelerate the decline in coal utilisation and increase renewable generation. Such developments illustrate that future conditions may diverge significantly from historical trends, and conservative defaults can only partially capture the impact of evolving climate policies.

²² Carbon Market Watch (2023): [Error Log: Exposing the Methodological Failures of REDD+ Forestry Projects](#).

²³ PV Knowhow (2024, March 4): [Philippines solar energy: Stunning 2040 goal of 50% renewable power](#).

2/• Conservative but not conservative enough

Using only two reference coal plants to determine the average rate at which plants are actually operating could be limiting in countries that have a lot of coal plants registered on their grids. This risks opening the door to project developers who could cherry-pick references that have the highest utilisation rate, which would lead to the highest baseline. This could result in baseline estimates that do not fully reflect real system conditions in the grid, likely leading to overestimated emission reductions. In addition, there is a lack of clarity in provisions for updating or adjusting the baseline annually when using these reference plants. Implicitly, this requirement seems to exist since there is annual monitoring, but it is not clearly written out in the methodology. Their operating patterns will almost certainly change over time, especially as more renewable energy is integrated into the grid.

3/• Changes in coal quality and supply can affect baseline emission accuracy

The methodology does not take into account possible changes in the quality or composition of coal that can occur when a coal-fired power plant changes its fuel supplier or type of coal it purchases. The properties of different coal types can vary significantly, affecting the amount of carbon emitted for each unit of electricity produced. If a plant sources coal from different suppliers over its lifetime, these variations in turn influence the estimation of avoided emissions. For example, at the start of the carbon crediting project, a coal plant might set its baseline assuming it will use coal A, which is heavily polluting, but if several years later it switches to using coal B, which is less polluting than coal A, then the avoided emissions in the baseline scenario will be overestimated. This uncertainty, which isn't reflected in the methodology's baseline setting rules, casts doubt regarding whether the carbon credits are accurately quantified.

Recommendations

- **Account for uncertainties over future electricity generation and cost:** The methodology should implement requirements for dynamic assumptions for both electricity generation and prices during the assessment period. Project developers should be instructed to use forward looking scenarios that reflect expected changes in the energy mix, such as the increased share and decline in cost of renewables. Regular updates should also be required to account for evolving dynamic markets. This will subsequently embed conservativeness in estimates and help avoid potential overestimation of emission reductions.

Project developers should be required to better address uncertainty by performing project-specific sensitivity analysis (a method used to determine how changes in variables and assumptions impact an outcome) using the PACM approach²⁴, which would be more conservative. Under this approach a project's expected early-retirement date or financial gap changes when key assumptions, such as electricity prices, coal prices, generation, or discount rates, are varied. This helps show whether the results are robust or overly dependent on uncertain inputs on a project by project scale.

- **Reassess the financially attractive baseline retirement date at each crediting renewal:** The methodology should reassess the financially attractive baseline retirement date at each crediting renewal (every 5 years) under the new version 5 of the VCS Standard. This ensures that changing market conditions and updated assumptions are reflected, improving the conservativeness of estimates.

- **Include requirements for listing energy source replacements feeding the grid:** Verra's methodology should require provisions so that the project developer retiring the coal power plant demonstrates that they will incur the costs of replacing the electricity generation. Therefore, the project developer should include a pairing plan that includes such details as the location, type, name, and expected quantity of replacement generation. Similar information is already required when renewable energy sources are paired with the coal project, and extending this requirement would improve transparency and ensure the emissions impact is accurately taken into consideration.

²⁴ UNFCCC (2024): *Standard: Demonstration of Additionality in Mechanism Methodologies*. Section 6.3.2. paragraph 39. p. 12

- **Addressing uncertainty in baselines based on historical data:** Uncertainty in baseline quantification should be measured and transparently communicated. To address the uncertainty related to the use of historical data, the methodology should adopt a downward adjustment similar to that used in the Paris Agreement Crediting Mechanism.²⁵ This would mean applying a discount factor to the baseline utilisation rate or to the credited emission reductions to account for the risk that future coal generation will decline faster than historical data suggests.²⁶ Such an adjustment would improve the conservativeness in baseline-setting.
- **Improving the robustness of baseline representativeness in coal-heavy grids:** In grids with a large number of coal plants, using all coal plants that meet the eligibility criteria set out by the methodology to calculate the average capacity factor would provide a more representative picture of utilisation across the entire grid instead of just two reference plants. In addition, an annual reassessment of the baseline during monitoring should be clearly emphasised to capture likely changes in capacity factor over time, including reductions in coal output and increases in renewable energy generation in the grid.
- **Adjust baseline calculations to reflect changes in coal quality:** The methodology should require project developers to consider potential changes in coal quality and composition, and encourage them to opt for the most conservative of estimates when determining the baseline emission factor. In cases where a coal plant sources coal from a single and identifiable local supplier, the specific emission factor for that coal type should be applied. However, if the plant uses coal from multiple or changing suppliers, the methodology should require application of the most conservative (i.e., lowest) emission factor estimate to avoid overestimating baseline emissions and credited reductions.

²⁵ UNFCCC (2024): *Standard: Setting the Baseline in Mechanism Methodologies (A6.4-STAN-METH-004, Version 01.0)*.

²⁶ UNFCCC (2024): *Standard: Setting the Baseline in Mechanism Methodologies (A6.4-STAN-METH-004, Version 01.0)*, sec. 7, para. 62, p. 18.



Leakage

Carbon leakage refers to an unintended increase in greenhouse gas emissions outside of a project's boundary as a result of the project's implementation. In the case of the early retirement of coal plants, leakage can happen when lost power generation simply shifts to other coal or fossil fuel facilities instead of being replaced by clean energy sources like renewables.

In this project type, leakage may occur when the electricity previously supplied by the retired coal plant is replaced by power from other fossil fuel sources, like other coal power plants, or even when the electricity is replaced by generation from a renewable energy source which may be associated with greenhouse gas emissions (e.g. methane in hydro reservoirs). Leakage may also occur internationally if the retirement of a coal power plant in one country simply results in the displaced power generation being taken up by another coal plant in a different country.

Replacing coal fired power plants with paired renewable energy_

KEY FINDINGS

1/• Low pairing of renewable energy creates a high risk of leakage

Under the current methodology, not all of the foregone electricity production must be replaced by a renewable energy source. Instead, only a portion of that lost power generation capacity needs to come from new renewable sources, at least 10% at the beginning of the project, gradually increasing to at least 40% by the end of the first crediting period, and as a consequence creating a high risk of leakage. This opens the door for the electricity gap to be filled by other, more carbon-intensive power plants, such as existing or new fossil fuel plants.

This is further exacerbated by the fact that the required paired renewable energy thresholds (10% to 40%) are tied to the retired coal plant's power generation capacity, rather than actual power generated, meaning the pairing threshold can even be much lower in practice. If most of the retired coal capacity is replaced by fossil fuel generation, the overall emissions on the grid may increase or remain largely unchanged, undermining the purpose of the project in the first place and rendering the underlying carbon credits completely ineffective.

This example suggests that the current minimum renewable pairing requirement in the methodology is not ambitious enough, as in certain circumstances project developers are already capable of achieving full or near-full replacement of coal power with clean energy.

2/• Counterfactual pairing plan is not robust

One of Verra's five pathways for pairing plans for replacing coal with renewable energy is not robust. One pathway allows for counterfactual pairing which can be satisfied when renewable power is argued to have come online earlier, or at higher capacity, than otherwise. However, this does not require a firm regulatory or financial link between the retirement of the coal plant and the construction of the proposed replacement renewable capacity. This means the renewable project could move ahead for reasons that have nothing to do with the coal plant shutting down, such as new subsidies, cheaper technology, or changing market conditions. As a result, the pairing may not actually reflect the impact of the coal retirement itself. It would mean the emissions reductions claimed by the project may not be real or fully attributable to the coal plant's retirement.

Using grid energy as the replacement source_

KEY FINDINGS

1/• Loophole in no-new coal commitments

The methodology's restriction on new coal commitments – which refers to policies that prevent the approval or construction of a new coal plant or increasing the capacity of an existing one - is insufficient, as it only applies to government owned utilities. Coal plants owned by an independent power producer are not subject to this ban. In that case, the only requirement for the independent power producer is to have committed publicly

not to build new coal plants or increase the capacity of those it already controls. This creates a significant leakage risk, allowing other independent power producers to potentially build new coal-fired power plants or expand existing ones to replace the capacity of retired coal plants.

For example, the South Luzon Thermal Energy Corporation (SLTEC) pilot project in the Philippines is situated next to two coal plants owned by a different independent power producer. In 2023, after the energy company ACEN started plans to retire the SLTEC plant early, the neighboring independent power producer subsequently revealed plans to resume construction of one of its coal plants in the region in 2024. While there is no direct evidence that the retirement of the SLTEC plant caused the neighboring independent power producer to resume construction, the timing does raise questions whether the restart was influenced by ACEN's retirement announcement and the generation gap left by SLTEC's closure.

2/• Distorted leakage calculations from the accounting of intermittent energy sources

The inclusion of intermittent energy sources – sources of energy that do not produce power continuously, such as wind and solar – in the calculation of the build margin emission factor can present problems. When intermittent sources are included in the build margin emission factor, and it is then assumed that this represents the technologies that would replace a retired coal plant, this overlooks the fact that other fossil-fuelled units with low intermittency would need to run more frequently to maintain grid stability. Due to intermittent renewable energy sources not being able to provide a power baseload solely without storage, their inclusion in the build margin underestimates the actual emission intensity. Consequently this would result in an underestimation of leakage emissions and an overly optimistic assessment of the project's climate impact.

3/• Lack of accounting for diesel backup energy sources

The methodology fails to account for the increased use of off-grid diesel generators that may result from coal plant retirements in regions housing unreliable grids. Where replacement capacity is insufficient, reduced grid reliability can lead households, businesses, and industries to rely more heavily on diesel powered backup generation. Since it is possible for diesel to have a higher emission factor than grid electricity, this shift can create unaccounted leakage emissions. By overlooking these indirect effects, the methodology could risk underestimating the project's overall climate impact. However the methodology does have a provision for the project developer to provide

written confirmation from the organisation or individual that monitors and controls the plant's operation. This confirmation verifies that the project early retirement will not have an effect on the grid's stability, thereby deeming the backup of generation capacity of off-grid diesel generators as negligible.

Recommendations

- **Strengthen and increase renewable pairing requirements:** The methodology should require 100% of paired electricity to come from renewable energy systems with integrated storage capacity, ensuring that the electricity lost from early coal plant retirement is not replaced by other fossil fuel sources. In some contexts, it is already technically and financially feasible to replace the electricity generation from a coal-fired power plant entirely with renewable energy. For instance, the SLTEC pilot project in the Philippines demonstrates this potential. The energy company ACEN, which formerly owned the SLTEC coal plant, is planning to build a 1.4 GW solar facility with an integrated 1.6 GWh battery energy storage system, sufficient capacity to fully replace the power generation output of the coal plant.²⁷
- **Remove improper pairing plan:** The counterfactual pairing option for renewable energy replacement should be removed, as it is not robust and could allow project developers to claim that coal generation is being replaced by renewable capacity that would likely have been built anyway due to external factors.
- **Improve requirement for no new coal commitment:** Verra should strengthen its no-new coal commitment safeguards by extending it to cover all power producers, including all Independent power producers nationwide, and not only state-owned utilities and the independent power producer initiating the coal plant retirement.
- **Exclude intermittent sources from build margin calculations to reduce uncertainty:** The methodology should exclude or appropriately adjust for intermittent energy sources, by potentially calculating the build margin emission factor which is a rating that measures the energy outputs of only the most recently built power sources on the grid separately for intermittent and non-intermittent energy sources. Since intermittent sources are unlikely to fully replace the continuous, baseload capacity of

²⁷ Esmael, L.K (Dec, 2024) ACEN set to replace coal plant with \$1.5-B solar facility.

coal-fired power plants, calculation of the build margin should be altered to reflect the most realistic mix of power sources necessary to replace retired coal plants.

- **Accounting for diesel leakage risks in unstable grids:** Verra should require methodologies to account for potential increases in diesel generation following coal plant retirements, particularly in regions with unstable or underdeveloped grids. Projects should include a clear assessment of grid reliability and model potential backup generation scenarios to estimate associated emissions from back-up energy sources.



Double counting

Double counting happens when the same emission reduction is claimed more than once by different organisations or countries (often known as “double claiming”). It can also occur when more than one carbon credit is issued – for example, under several carbon programmes – for the same emission reduction (known as “double issuance”). In the case of early retirement of coal plants through the VM0052 methodology, double issuance requirements seems to be particularly problematic when pairing renewable energy replacement and renewable energy source replacement from the grid.

KEY FINDINGS

1/● **Lack of safeguards against double issuance with paired renewables**

The methodology contains some guardrails to prevent project developers from counting the same emission reductions both from the retirement of a coal-fired power plant and for environmental credit systems that replace its capacity like renewable energy certificates and guarantees of origin, but not for carbon credits.

However, there are risks where different project developers are able to each receive credits for the same avoided emissions if there are no coordination mechanisms or legal agreements ensuring that the credit is only claimed once. The methodology does not have any such safeguards. Without them, there is a real possibility of double issuance for the same emission reductions: potentially from multiple projects registered with Verra (e.g. the coal plant retirement project and other renewable energy projects),

but more likely from other projects registered under different carbon crediting programmes (e.g. the coal plant retirement project under Verra and other renewable energy projects under another programme). Such an outcome would undermine the environmental integrity and credibility of both projects.

2/• Lack of alignment with renewable energy sources in the grid

Beyond directly paired projects, the methodology also fails to address potential double issuance at the grid. When renewable energy enters the grid and displaces coal-based electricity, both a coal phase-out project and a separate renewable energy project could claim credits for the same reduction in emissions. Currently, there are no clear provisions to ensure coordination between the project developers involved, who may also be seeking to receive credits for the same emission reduction. This lack of alignment creates a real risk that both sides could claim credit for the same emission reductions, one for replacing coal-based generation with renewable energy, and the other for producing that same renewable energy.

3/• Avoidance of double claiming due to overlap with mandatory national or international compliance schemes is generally well considered

Provisions by the VCS Standard help ensure that potential double claiming of project emissions with national or international compliance schemes, for example emission trading schemes (ETS), should not occur. In addition, if these emission reductions are part of such a compliance scheme, justification or proof needs to be provided to guarantee that the emission reductions are not counted under both the project and the compliance scheme.

Recommendations

- **Improve double issuance safeguard requirements:** Verra should introduce explicit safeguards and practical steps to prevent double issuance of carbon credits between coal retirement projects and renewable energy projects, both those directly paired with the retired coal plant as well as those supplying electricity to the same grid.

For renewable energy projects replacing retired coal power generation, Verra should require formal legal agreements between the coal retirement project developers and the renewable energy producers to ensure that the same emission reductions are not credited twice. Project developers should be mandated to identify any renewable

energy projects contributing replacement capacity to the grid. This would help anticipate how much renewable energy is expected to enter the system, and enable project developers to more accurately estimate the share of emission reductions claimed by the project's intervention.

Verra should ensure these safeguards apply to all projects registered under Verra (internal due diligence of no registration within Verra that leads to double issuance) as well as between projects registered under Verra and other carbon crediting programmes (external due diligence).



Just transition

Delivering on just transition principles is a reference to ensuring that the social and economic benefits of the energy transition, through the retirement of a coal-fired power plant, are shared fairly among all parties involved and affected by the project's implementation. This includes, but is not limited to, workers, local communities, suppliers, and other stakeholders whose livelihoods or well-being may be impacted.

To ensure this principle is upheld, project developers must follow the guidelines set out in VMD0061, 'Just transition requirements for accelerated retirement of coal-fired power plants.'²⁸ These guidelines specify that developers should identify, consult, and support the following groups:

- Plant workers and employees whose jobs may be lost or disrupted.
- Contractors, suppliers, and ancillary businesses dependent on the coal plant's operations.
- Local communities living around the plant or relying on it for services or infrastructure.
- Consumers or households in the region who may be impacted by change in electricity access or affordability.
- Other regional economic actors (e.g. small businesses, transport) that depend on stable energy supply.

²⁸ Verra. (2025, May 6). *VMD0061: Just Transition Requirements for Accelerated Retirement of Coal-fired Power Plants (v1.0)*.

The module further requires project developers to establish clear procedures to engage these stakeholders in transition planning, introduce social safeguards, and provide retraining or alternative employment opportunities where relevant. It also calls for mechanisms to monitor and report on social and economic impacts over time, ensuring that the transition away from coal is both equitable and sustainable.

However, requirements in the methodology should provide clearer guidance on project developer accountability in design, monitoring and implementation stages to ensure fairness and inclusivity, and that the benefits are shared equitably between affected stakeholders, with proper support provided to workers and communities whose livelihoods are dependent on coal.

KEY FINDINGS

1/• **Uncertainty in the minimum benefit-sharing percentage provision**

The 2% of net revenue from carbon credit sales earmarked for benefit sharing may not be sufficient or reliable. Firstly, using “net” as a metric can be problematic because it can lead developers to be selective in determining their overall costs in order to reduce their overall profits on paper and thus have less “net” revenue to share. A share of gross revenue delivers more than net.

For example, if a project developer hypothetically earned \$1 million in carbon credit sales, but reported \$900,000 in costs, the 2% benefit share would apply only to the remaining \$100,000, not the full \$1 million. In contrast, basing the rule on gross revenue would result in larger shared benefits that are less open to accountancy manipulation.

Second, because the value of this contribution depends on volatile carbon prices and factors such as leakage that can affect credit issuance, the total amount available for affected workers and communities could fluctuate widely. Linking compensation directly to credited emissions also creates perverse incentives, as project developers may be tempted to overestimate reductions, and affected stakeholders might support inflated figures to secure higher payouts.

2/• Third party “neutrality”

The methodology could be openly interpreted to allow project developers to choose the so-called “neutral” third party who would handle mediation or arbitration if disagreements arise between stakeholders and project developers. This arrangement risks bias and conflicts of interest, since the selected mediator may be more aligned with the developer’s interests than those of affected communities. This setup could therefore undermine trust and credibility in the consultation process and weaken the fairness of any conflict resolution.

3/• Overreliance on public support

The module can be interpreted in a way that places too much dependence on public government support (e.g. unemployment benefits) rather than requiring equitable benefit sharing from project developers through the revenues they earn from carbon credits. As currently formulated, the requirements could allow project developers to be left “off the hook” from taking full responsibility for supporting affected stakeholders.

4/• Severance package limitations

Severance package provisions could be inadequate for coal plant retirements in countries with weaker economies, where compensation levels are often too low to provide meaningful support for displaced workers or their families during the transition period.

5/• Third-parties should not be primarily responsible for implementing just transition plans

While the involvement of third parties in implementing just transition plans is valuable and can provide technical or financial support, it should not serve as a substitute for the project developer’s own responsibility. Project developers must remain the actor primarily accountable for addressing the social and economic impacts of early coal plant retirements on affected workers and communities.

Recommendations

- **Strengthen and stabilise the benefit sharing mechanism:** Verra should revise the benefit-sharing mechanism calculations so that they are based on gross, rather than net, revenue to avoid the risk of developers underreporting profits. Additionally, Verra should consider requiring the project developer to additionally require a fixed minimum monetary value per sold credit to support impacted communities, which could be based on project size and local conditions. Combining a gross revenue sharing model with a fixed monetary value per sold credit would improve predictability, transparency and fairness.
- **Improve clarity around safeguard requirements:** The methodology should improve language and clarity in order to require third parties to remain neutral and be selected jointly by all key stakeholders, not only by the project developer.
- **Reduce over-reliance on public support and third parties:** Verra should require project developers to implement fair and transparent benefit sharing arrangements that are decoupled from over-reliance on public and third-party support to avoid a situation where nobody takes responsibility and local communities are left out.
- **Context specific severance packages:** Severance and compensation requirements should be strengthened to reflect local economic realities.

CONCLUSION

Overall, Carbon Market Watch finds that Verra's VM0052 methodology and its associated modules for the early retirement of coal-fired power plants are not expected to deliver high quality carbon credits, which is very problematic given they are likely to be used to offset ongoing emissions. Verra's approach is undermined by numerous weaknesses that limit its ability to guarantee strong environmental integrity.

The methodology's design sets out to guide project developers in retiring coal plants earlier than they would have otherwise. While it attempts to guard against several risks, significant uncertainties remain, including many that are tied to the inherently complex nature of power grids and assumptions about future conditions and decision factors of coal plant operators. These uncertainties raise real doubts about estimates for leakage or displaced emissions in particular.

The methodology falls short of setting adequate requirements to ensure the power generation capacity lost tied to coal plant retirement is fully replaced by renewable energy. The minimum thresholds are too low, and should be substantially increased and strengthened to reduce the risk of leakage. Verra should notably strengthen its "renewable energy pairing" provisions in order to require project developers to secure 100% of replaced electricity generation from renewable energy systems with integrated storage capacity.

In addition, changes regarding future increased renewable energy generation, potential implementation of energy policies and variations in future coal quality and supply are not adequately reflected in the methodology, introducing notable uncertainty in the estimate of the number of carbon credits. There is also no requirement, during the renewal of the crediting period, to reassess key financial assumptions about the expected retirement date of a coal plant, introducing risks around additionality and baseline-setting. The methodology also fails to implement a project-specific sensitivity analysis which would help better test key assumptions. These loopholes could allow those developing projects to overstate their emission reductions, leading to the excess issuance of carbon credits.

When considering the gaps regarding leakage, baseline-setting and additionality, as well as the risk of double issuance that is not properly mitigated, Carbon Market Watch finds that the methodology fails to inspire confidence in Verra's ability to credibly issue credits that demonstrate real climate impact.

While the provisions for a just transition include positive elements, the current framework leaves too much room for interpretation. The requirements lack clarity, introducing flexibility in how they might be applied. Strengthening these requirements, by ensuring project developer accountability, improving benefit-sharing requirements, and guaranteeing full stakeholder participation, would help ensure that coal plant retirement projects deliver real social and economic benefits to those most likely to be affected by the transition.

In the spirit of constructive engagement, this briefing provides targeted recommendations to improve the VM0052 methodology which are detailed in the above sections. However, even following any major revisions and improvements, Carbon Market Watch remains very concerned that the methodology's inherent risks, uncertainties and assumptions make coal crediting too prone to error, manipulation, and overissuance to be considered trustworthy.

Carbon Market Watch calls on Verra to put VM0052 on pause and go back to the drawing board to work on significant revisions. Pilot projects such as the South Luzon Thermal Energy Corporation pilot intending to use this methodology should suspend their plans. This must be done urgently, or else projects will begin to issue significantly flawed carbon credits. If such credits are used for offsetting purposes, it will lead to a net increase in global greenhouse gas emissions. This clearly cannot be the aim. Rapidly phasing out the use of coal in the power sector is absolutely necessary, but using carbon credits to do so risks defeating the purpose.

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