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MECHANISM METHODOLOGIES: GUIDANCE ON ARTICLE 6.4 BASELINE SETTING APPROACHES

Guidance Paper

AUTHORS:

Chandan Kumar Sah
Sergi Cuadrat
Kaja Weldner
Axel Michaelowa
Sven Feige
Juliana Keßler

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Authors

Chandan Kumar Sah
Sergi Cuadrat
Kaja Weldner
Axel Michaelowa
Sven Feige
Juliana Kessler

Reviewers

Anna Kovács
Sandra Greiner

Design and layout

Rosaria Caddeo

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EXECUTIVE SUMMARY

This guidance supports methodology proponents and Article 6.4 activity developers in setting baselines under the Paris Agreement Crediting Mechanism (PACM) in line with the Article 6.4 rules, modalities and procedures (RMP) and the mechanism's standards and tools. The guidance describes stakeholders' room for manoeuvre, examines how approved and proposed PACM methodologies have interpreted selected requirements, and draws practical lessons for methodology design and implementation.

Three baseline approaches are generally applicable: a best available technology (BAT) approach, an ambitious benchmark approach, and an existing actual or historical emissions approach. For each component of an activity, methodology proponents must select and consistently apply one of these approaches. The paper explains the steps for calculating the baseline under each approach and the possibility for developers to interpret steps in different ways, i.e. their room for manoeuvre.

Whichever approach is chosen, three requirements work together to ensure crediting baselines' robustness: conservativeness in scenario selection; a downward adjustment that increases over time – starting from zero for the BAT and ambitious-benchmark approaches, or from a calculated initial value for the existing actual or historical emissions approach; and a year-by-year comparison in which the applicable crediting baseline is set as the lower of the conservatively determined BAU baseline and the downward-adjusted baseline.

While only a small number of PACM methodologies have been approved to date, they show significant differences in the definition of geographical reference areas, economic-viability screens, benchmark thresholds and downward adjustment factors. This means that the room for manoeuvre is relatively large, and actual baselines will differ significantly. The large body of methodologies submitted but not decided upon to date shows even larger differences.

Key choices for methodology proponents and activity developers thus include how to select and justify a baseline approach and its geographical scope, how to determine and defend the downward adjustment factor (DAF), including the choice of anchor year and how to model the interaction between the downward-adjusted baseline and the conservative BAU over the crediting period. The observed heterogeneity in downward adjustment design across submitted methodologies means that until the Supervisory Body provides further guidance or default values, these choices rest with methodology proponents, who should document and justify them explicitly. How quickly this design space converges will shape the consistency of baselines across activity types and, with it, the scalability of the PACM before 2030.

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Table 1: Overview of baseline setting approaches in approved and submitted PACM methodologies 20

Abbreviations

A6.4ER	Article 6.4 Emission Reduction
AFOLU	Agriculture, Forestry and Other Land Use
AMM	Approved Mechanism Methodology
AMT	Article 6.4 Methodological Tool
ATR	Autothermal Reforming
BAT	Best Available Technology
BAU	Business as usual
BMUKN	Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety
CDM	Clean Development Mechanism
CF	Conservativeness Factor
CI	Confidence Interval
CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
CTEC	Continuously Tracked Energy Consumption
DAF	Downward Adjustment Factor
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emission Reduction
fNRB	Fraction of Non-Renewable Biomass
GHG	Greenhouse Gas
GWP	Global Warming Potential
HFC	Hydrofluorocarbon
HFO	Heavy Fuel Oil
ICS	Improved Cookstove
KPT	Kitchen Performance Test
LDAR	Leak Detection and Repair
LDC	Least Developed Country
MEP	Methodological Expert Panel
NCV	Net Calorific Value
NDC	Nationally Determined Contribution
PA	Paris Agreement
PACM	Paris Agreement Crediting Mechanism
PDD	Project Design Document
PMM	Proposed Mechanism Methodology
PoA	Programme of Activities
RAF	Regulatory Adjustment Factor
RMP	Rules, Modalities and Procedures
SBM	Supervisory Body of the Article 6.4 mechanism
SIDS	Small Island Developing States
SMR	Steam Methane Reforming
UNFCCC	United Nations Framework Convention on Climate Change
VCM	Voluntary Carbon Market

1. OBJECTIVES OF THE GUIDANCE

The market-based policy instruments established by Article 6 of the Paris Agreement (PA) provide a reporting and accounting framework (Article 6.2) and a mechanism (Article 6.4 – Paris Agreement Crediting Mechanism, PACM) for the operation of baseline-and-credit systems at the international level. As the name suggests, key to these systems is the establishment of a crediting baseline, against which emissions following the implementation of a mitigation activity are compared to calculate the volume of mitigation that can be credited. A crediting baseline is a plausible reference scenario of a greenhouse gas (GHG) trajectory that would occur in the absence of the mitigation activity in question.

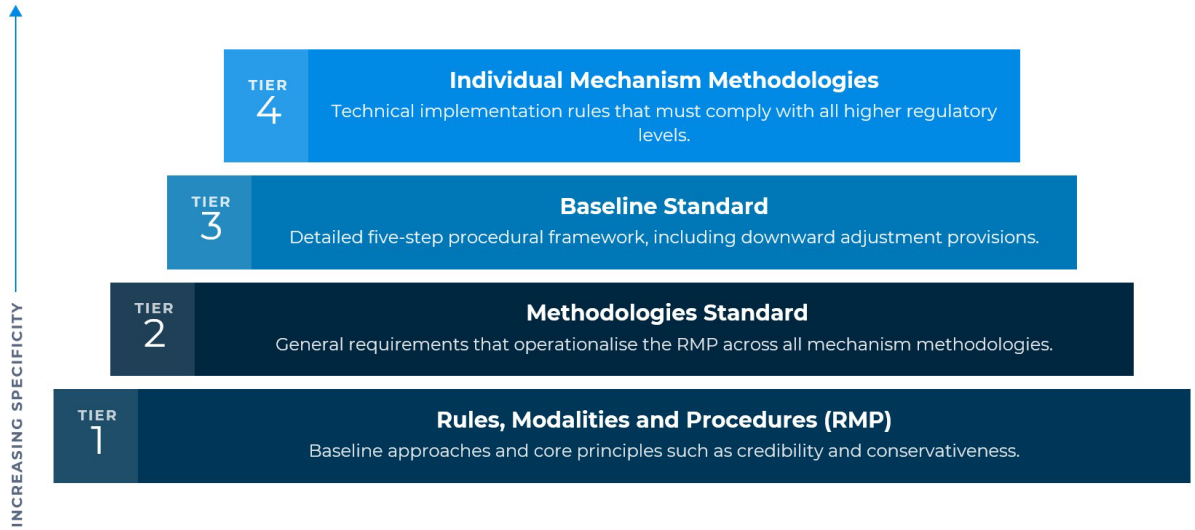
All states that ratified the PA have committed to set and implement national GHG mitigation targets and enhance the level of ambition of these targets over time. Therefore, the practice of assuming a business-as-usual (BAU) trajectory that implies emissions increases, as widely applied under the Clean Development Mechanism (CDM) of the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), no longer constitutes an appropriate reference scenario. All activities under Article 6 of the PA need to apply below BAU baselines as specified by the Article 6.4 rules, modalities and procedures (RMP), specifically paragraph 33 of the Annex to Decision 3/CMA.3 (UNFCCC, 2021). The RMP are operationalised and overseen by the Supervisory Body of the Article 6.4 mechanism (SBM). In October 2024, the SBM adopted the “Standard: Application of the requirements of Chapter V.B (Methodologies) for the development and assessment of Article 6.4 mechanism methodologies” (UNFCCC 2024a, referred to subsequently as “Methodologies Standard”). In May 2025, the SBM adopted the “Standard: Setting the baseline in mechanism methodologies” (UNFCCC 2026a, referred to subsequently as “Baseline Standard”), which details the requirements for baseline setting aligned with the RMP. The Baseline Standard provides detailed requirements for baseline setting, elaborating the higher-level regulations of the Methodologies Standard and the RMP (see Section 2 for a detailed description of the regulatory layers). It was subsequently revised to extend its scope to programmes of activities (PoAs), and version 2.0 was adopted by the SBM at its twenty-third meeting (SBM 023) in October 2026.

Despite its high level of detail, the Baseline Standard leaves methodology proponents and activity developers considerable room to interpret its key requirements. Section 3 of this guidance describes the resulting room for manoeuvre. Section 4 examines the interpretation of some requirements in the context of approved and proposed PACM methodologies. Finally, section 5 discusses what the experience gained so far means for methodology proponents and activity developers.

2. BASELINE SETTING IN MECHANISM METHODOLOGIES

The PACM operates under a multi-layered framework in which mandatory high-level rules set the foundation (UNFCCC, 2023). These rules are operationalised through standards, which are applied in specific mechanism methodologies. Figure 1 illustrates the hierarchy of regulatory documents governing baseline setting under the PACM.

Figure 1: PACM baseline setting - The regulatory hierarchy

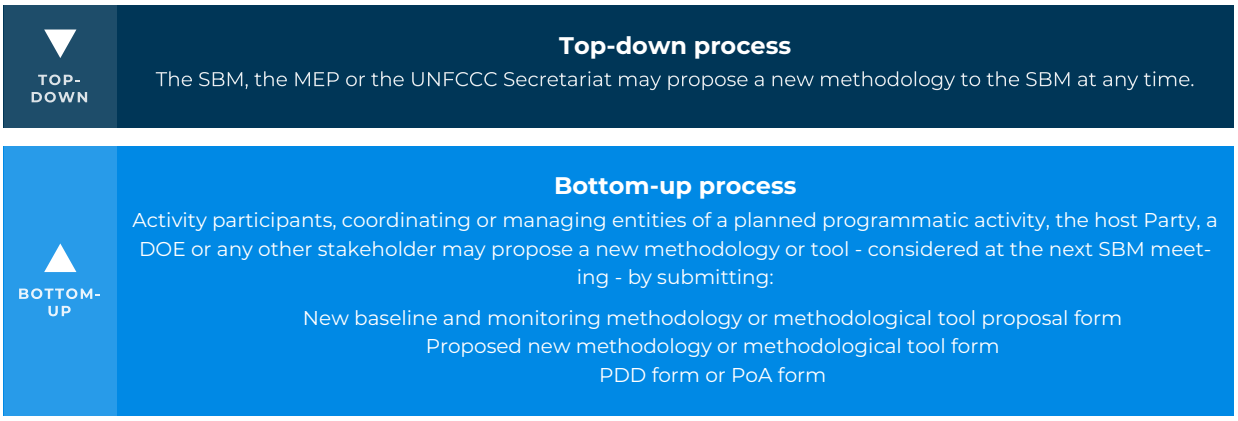


Source: Authors, based on UNFCCC, 2023

At the top level, the RMP establish the three permitted baseline approaches and the overarching principles. These are operationalised through the Methodologies Standard (UNFCCC, 2024a), which sets general requirements for all mechanism methodologies. The Baseline Standard (UNFCCC, 2026a) provides detailed rules and procedures for baseline setting. Individual mechanism methodologies apply to specific activity types and must comply with all three regulatory documents. Consequently, they cannot introduce provisions that contradict higher-level requirements.

Methodologies under the PACM can be developed through two pathways (UNFCCC, 2024b). Under the top-down process, the SBM initiates methodology development either on its own accord – prioritising those relevant to Least Developed Countries (LDCs) and Small Island Developing States (SIDS), host countries, and those with transformative potential as well as potential for PoAs and participation of small or micro-businesses – or in response to proposals submitted by the mechanism's Methodological Expert Panel (MEP) or the UNFCCC secretariat. Under the bottom-up process, stakeholders may submit a proposed methodology ahead of MEP meetings by submitting the required documentation along with the project or PoA design document.

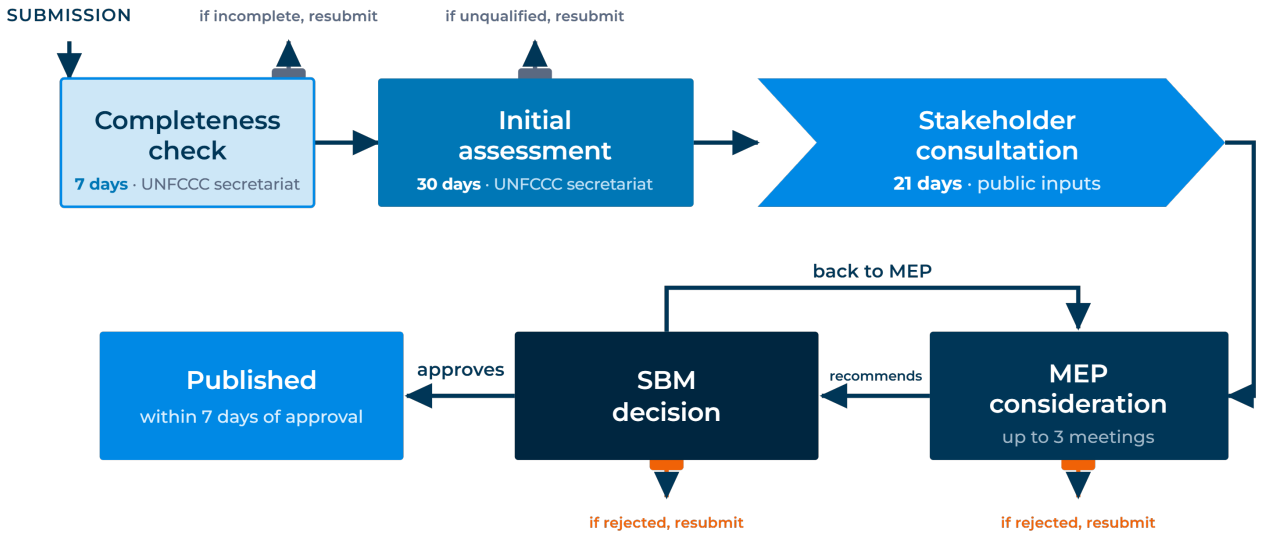
Figure 2: PACM methodology development pathways



Source: Authors, based on UNFCCC, 2024b

Figure 3 shows the procedure for methodology development. At any stage, additional information may be requested from the methodology proponent.

Figure 3: PACM methodology assessment process



Source: Authors, based on UNFCCC, 2024b

As of October 2026 (UNFCCC, 2026b), 32 bottom-up submissions have been received; nine have passed the initial assessment stage: PMM001 (green ammonia), PMM003 (pumped hydro storage), PMM005 (savanna fire management), PMM006 (fertiliser production), PMM007 (HFC recovery and destruction), PMM008 (leak detection and repair), PMM009 (low-carbon navigation routing), PMM010 (substitution of fossil fuels by MSW in cement manufacture), and PMM011 (Low-carbon-intensive hydrogen). Five methodologies have been formally approved through the top-down process: AMM001 (landfill gas), AMM002 (N_2O abatement from nitric acid production), AMM003

(Electricity generation from renewable sources), AMM004 (Cooking energy transitions), and AMM005 (Energy efficiency measures in household cooking).

3. KEY ARTICLE 6.4 BASELINE REQUIREMENTS

The RMP require that mechanism methodologies – among other things – must be conservative, credible and below BAU (UNFCCC, 2021). In this chapter, we discuss the specific requirements that the Baseline Standard introduces to operationalise these principles.

3.1. Generally applicable approaches

Three baseline setting approaches are generally applicable: (a) best available technology (BAT), (b) ambitious benchmark, or (c) existing actual or historical emissions (UNFCCC, 2021, Annex, para. 36). Mechanism methodologies must select one of these approaches for each component of the activity and justify it. Methodology proponents must avoid mixing approaches within a single component; different components may use different approaches.

Figure 4: The three baseline setting approaches

Best Available Technology (BAT)	Ambitious Benchmark	Existing Actual / Historical Emissions
Technology or practice with the lowest emissions intensity among all economically feasible, environmentally sound options available in the baseline reference area that provides a similar output as the proposed activity.	The output-weighted average performance of the best-performing comparable activities in the reference area.	The emissions that occurred, or would occur, at the specific site or in the sector prior to, or in the absence of, the Article 6.4 activity.

For the existing actual or historical emissions approach, downward adjustment must apply from the first calendar year of the crediting period, whereas for BAT and the ambitious benchmark, it may may apply from the year following the start of the first crediting period, unless an exemption applies (UNFCCC 2026a, paras 30-33).

Regardless of the selected approach, the Baseline Standard (Appendix 1, para 15) requires all methodology proponents to identify any perverse incentives to inflate the calculated emissions reductions or net removals and ensure that they are avoided. This refers to, for instance, incentivising

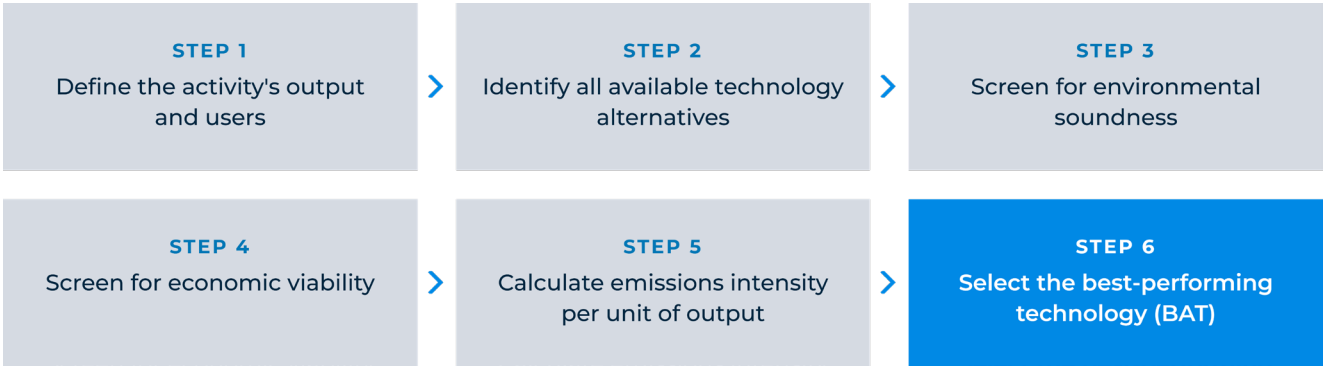
increased production to inflate baseline emissions, or rewarding the accumulation of substances (such as high-global warming potential (GWP) refrigerants) that would subsequently be destroyed for credit generation.

3.1.1. Best available technology

As per section 6.1 of the Baseline Standard, BAT is defined as the technology or practice that (i) provides a similar output to the activity, (ii) is economically viable and environmentally sound in the baseline geographical reference area, and (iii) results in the lowest emissions intensity (or largest removals intensity) per unit of output among all qualifying technologies.

Mechanism methodologies must either directly specify the BAT or prescribe a stepwise procedure for activity participants to identify it. The standard sets out a mandatory six-step procedure as shown in the figure below.

Figure 5: Six-step procedure for determining Best Available Technology (BAT)



Source: Authors, based on UNFCCC 2026a

Room for manoeuvre for methodology proponents and activity developers

The Baseline Standard allows flexibility in interpreting several key parameters:

- Geographical reference area: It does not prescribe a fixed geographic scope. Methodologies may specify a global, national, or sub-national reference area, but the choice of the area needs to be well justified. A narrow scope may be justifiable where technology availability is geographically constrained (e.g., grid-based electric cooking is unavailable in off-grid rural areas).
- Identification of BAT: Methodology proponents may choose to specify BAT directly in the methodology text or design a procedure for activity participants to determine it. The latter offers flexibility but increases the complexity of the project or PoA design document (PDD/PoA-DD). It also increases the risk of divergent outcomes across activities. An additional constraint applies where a host Party has designated BAT as the mandatory approach for a specific sector. In such cases, the methodology has no discretion to use an alternative

baseline approach for that sector, regardless of whether the ambitious benchmark or historical approach might produce a more conservative result.

- Validity period: The Baseline Standard requires methodologies to specify the duration for which a BAT determination remains valid (within the five-year mandatory revision period of methodologies as per Appendix 1, para 26). Given that BAT is likely to improve over time and can improve substantially over a few years depending on the technology, a direct relationship between the length of the validity period and the conservativeness of the baseline is possible. Considering that methodology updates generate transaction costs and reduce credit volumes for activity developers, there may be a perverse incentive to maintain the longest possible validity periods, even if the BAT improves rapidly.
- Definition of economic viability: Given experiences with investment tests in additionality determination (UNFCCC, 2026c), the notion of what is economically viable can vary significantly. Methodology proponents should define economic viability transparently using the Baseline Standard's criteria (paras 44-45, including household access to finance), applying conservative and justified cost, discount-rate and finance-access assumptions ex ante rather than leaving the term open.
    - Household activities: For technologies used in household settings, the methodology must define what 'economic viability' means for households specifically, including assumptions on access to finance. Usually, it is assumed that households have higher discount rates than private companies, meaning that higher internal rates of return are required to make an activity attractive. Households may also only have access to loans at interest rates that are much higher than those for commercial borrowers. This is an area where materially different BAT designations can result from different internally consistent estimates of "economic viability".

Example 1: Clean cookstoves displacing biomass stoves

Applying the BAT approach, the methodology identifies the most efficient cookstove technology that is both available to and economically viable for households in the geographical reference area. This BAT could be an Improved Cookstove (ICS) with a higher thermal efficiency than traditional three-stone fire method whose cost does not exceed a level that a typical household in the relevant area could muster using commonly available means of finance (e.g. local moneylenders or microfinance schemes). The emissions intensity (kg CO_2-eq per meal or per MJ of useful cooking energy) of the ICS then determines the baseline, rather than the average performance of all biomass stoves in use.

Identified open questions

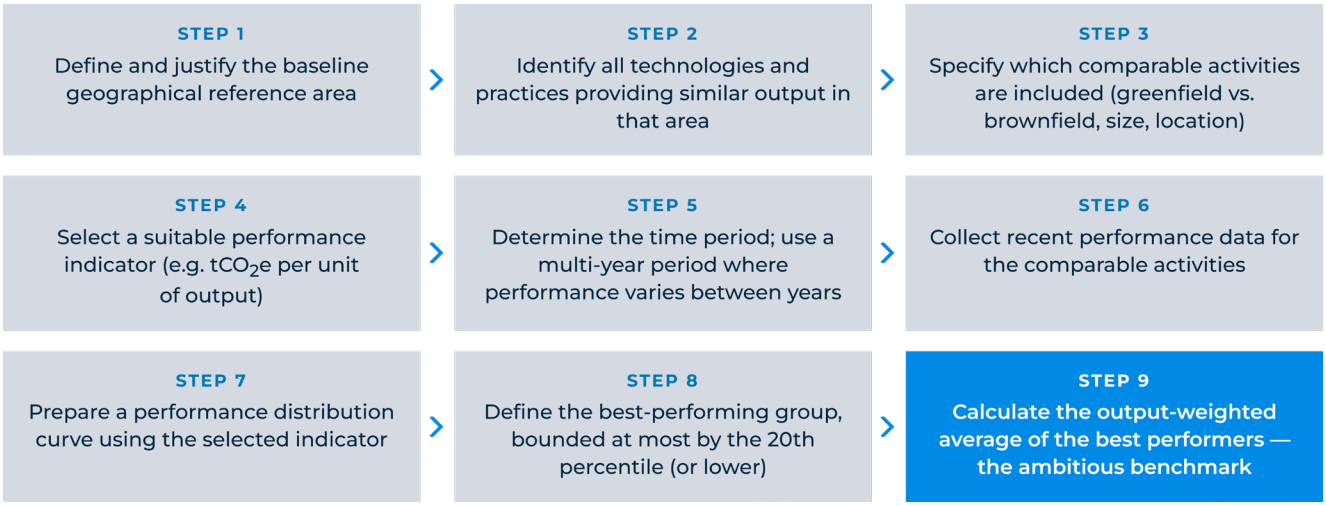
For methodology proponents:

- How should economic viability be defined when technology costs, discount rates and interest rates vary significantly across sub-national regions or for different user groups (e.g., urban vs. rural households, micro-enterprises vs. large industrial facilities)? This would require a strong spatial as well as target group differentiation, which will lead to significant increases in transaction costs and strong differences in BAT emissions intensity and thus attractiveness of activities depending on the geographic location and target group.
- Where BAT is identified at the methodology level rather than by activity participants, how should the methodology specify the circumstances under which the BAT should be revised in response to external technological developments?
- How should methodologies handle activity types for which there are multiple competing BATs delivering similar performance regarding services/outputs but with different inputs (e.g., green hydrogen production from electrolysis vs. biomass gasification)?

3.1.2. Ambitious benchmark approach

The ambitious benchmark is defined as the output-weighted average emissions or removals performance of the best-performing comparable activities in the baseline geographical reference area and under similar socio-economic and technological circumstances. The Baseline Standard prescribes a nine-step determination procedure depicted in Figure 6 below.

Figure 6: Ambitious benchmark determination procedure



Source: Authors, based on UNFCCC 2026a

Room for manoeuvre for methodology proponents and activity developers

The ambitious benchmark approach involves several parameters for which the Baseline Standard grants explicit discretion:

- Choice of the baseline reference area: The choice of the geographical reference area affects the resulting benchmark value, since it determines which facilities enter the performance distribution. The size of an appropriate reference area depends on the geographical distribution of technologies. Reference areas should share the key characteristics of the area where the methodology applies (climatic, technological, socio-economic), so that the benchmark reflects genuinely comparable circumstances.
- Percentile cut-off: The standard sets a threshold at the 20th percentile. More ambitious choices (10th percentile, etc.) are possible but reduce the credit volume. Methodology proponents must justify their choice of percentile, and it is currently unclear whether the SBM will enforce benchmarks going beyond the threshold.
- Performance indicator: The choice of indicator (e.g., tCO_2-eq per tonne of product, per GJ of energy output, per unit of service delivered) is left to methodology proponents. The indicator must be measurable and verifiable for project participants.
- Alternative approaches: The standard explicitly allows methodology proponents to propose alternative benchmark determination approaches if they are conservative and well-justified. This provision is particularly relevant for sectors where observed performance data is scarce (e.g., emerging technologies with fewer than 20 comparable facilities globally). In such cases, technology performance modelling calibrated against available data points may be proposed as an alternative to the standard percentile-based benchmark. The burden of proof for conservativeness rests with the methodology proponent, and the MEP will assess whether the alternative produces results at least as stringent as the 20th percentile approach would under full data availability.

Example 2: Process switching in cement plants

This mitigation activity involves replacing a four-stage preheater kiln with a dry-process kiln featuring a seven-stage preheater and precalciner. In this manner, it cuts specific thermal energy use and thus CO_2 per tonne of clinker.

Under the ambitious benchmark approach, the methodology collects performance data for all comparable cement production facilities operating in the reference region and ranks them by emissions intensity (tCO_2 per tonne of clinker). Applying a 20^{th}-percentile cut-off, only the top 20% most efficient plants are retained. The output-weighted average emissions intensity of this best-performing group - say, 0.72 tCO_2 per tonne of clinker - becomes the crediting baseline. The project earns credits only to the extent that its actual emissions intensity falls below this already-ambitious threshold, not below the sector average (which might be 0.85 tCO_2/t). The benchmark is updated periodically as more facilities reach best-in-class performance, ensuring the baseline does not become progressively less stringent over time.

Identified open questions

For methodology proponents:

- Which activity types are deemed appropriate for benchmarking? The criteria specified – homogeneous outputs, emissions per unit of output depend on multiple factors (technology, operational practices, fuels, feedstocks, local conditions) – can be interpreted in different ways. Note the caveats regarding benchmarking discussed by (Schneider *et al.*, 2012).
- Which technologies are used to calculate the performance distribution curve? The choice of these technologies is crucial for the level of emissions intensity of the benchmark. For example, if a benchmark is applied to the steel sector including both blast furnaces and electric arc furnaces, then the benchmark will be much more stringent than for a benchmark applied only to blast furnaces.
- For emerging sectors in which very few comparable activities exist, how should methodologies handle data scarcity at the required percentile cut-off? At what point is the dataset too small to reliably determine a percentile benchmark?
- How should methodologies address significant year-on-year variability in performance data (e.g., fuel price changes affecting fuel use and thus emissions intensity of an installation being part of the performance distribution curve). Is multi-year averaging over three years adequate?

For activity developers:

- In sectors with rapid technological improvement, the benchmark set at methodology development stage will become more stringent and thus reduce credit volumes in a way that is unpredictable at project start.
- Where the benchmark is determined by activity participants (rather than fixed in the methodology), there is uncertainty about which data sources and inclusion criteria the MEP will accept during methodology or PDD/PoA-DD assessment.

3.1.3. Existing actual or historical emissions approach

Key requirements

This approach sets the baseline at the emissions or removals that occurred (or would occur) at the specific activity site or in the activity's sector prior to, or in the absence of, the Article 6.4 activity. It is the only approach that draws directly on site-specific or sector-specific observed data rather than technology benchmarks.

Paras 63-64 of the Baseline Standard require methodology proponents to: (a) specify or provide a clear procedure for determining the pre-activity baseline scenario (continuation of pre-activity practices; dynamic shift away from pre-activity; retrofit or replacement; delayed implementation); and (b) define the method for quantifying baseline emissions and/or removals, choosing from four permitted approaches: site-specific historical data, a control group comparison, model-based methods, or default factors. For activities that replace specific equipment, the baseline validity is capped at the reasonably expected remaining lifetime of that equipment.

Room for manoeuvre for methodology proponents and activity developers

- Baseline scenario selection: The standard enumerates four possible pre-activity scenarios (continuation of pre-activity practices; dynamic shift away from pre-activity; retrofit or replacement; delayed implementation). These scenarios differ significantly: the latter three involve a reduction of the baseline over time, whereas continuation of pre-activity practices does not. Methodology proponents may specify one or allow activity developers to select from applicable scenarios with justification.
- Historical data period: The standard requires methodologies to specify the minimum number of historical years to consider, depending on inter-annual variability.
- Control groups: For activities affecting many dispersed sites or households, a control group approach may be used. If well chosen, control groups are robust approaches to baseline setting as they share location, technology, socio-economic circumstances and existing practices with the activity and pass similarity tests. Methodology proponents must define selection criteria for the control group and statistical tests for similarity.

- Default factors: Where site-specific measurement is impractical (e.g., household-level cooking behaviour), methodologies may use default factors from approved sources. The standard requires justification of source relevance and conservativeness.

Example 3: Replacing HFO-fired steam boilers with a high-efficiency biomass fired boiler

An industrial facility operates an existing heavy fuel oil (HFO)-fired steam boiler that the operator plans to retire and replace with a high-efficiency biomass-fired boiler. Under the historical/actual emissions approach, the baseline is established by recording the specific boiler's actual fuel consumption and CO_2 emissions over the three years prior to the project (e.g., averaging 2400 tCO_2/year based on verified fuel purchase records and plant-specific emission factors). This site-specific, observed average is used for baseline calculation, subject to downward adjustment (see below).

Identified open questions

For methodology proponents:

- How should methodologies handle cases where historical data shows a declining trend in emissions (e.g., sector efficiency already improving)? The Baseline Standard permits performance improvement factors but does not prescribe how to identify and quantify them.
- For activities in sectors with rapidly changing market conditions (fuel prices, policy shifts), how should methodologies define the 'most plausible' continuation of the pre-activity scenario to avoid projecting an overly emissions-intensive BAU?
- The standard requires that the baseline validity for activities replacing specific equipment is capped at the remaining equipment lifetime. How should methodology proponents estimate lifetime in sectors where depreciation schedules and operational norms vary widely?

3.2. Downward adjustment of the baseline

According to the Methodologies Standard (UNFCCC, 2024a, para. 43), mechanism methodologies are required to apply downward adjustment to baselines to address certain elements of para 33 of the RMP. This para specifies, among other requirements, that mechanism methodologies must encourage ambition over time and align with the long-term temperature goal of the Paris Agreement. Downward adjustment applies in two contexts: the first calendar year of the crediting period's start date (section 7.1, "initial downward adjustment"), required for the historic/actual emissions approach; and subsequent years (section 7.2, "continuous downward adjustment"), required for all baseline-setting approaches. For BAT and ambitious benchmark approaches, the methodology proponent may justify an exemption from continuous downward adjustment, subject to SBM approval. The standard provides the general principles and considerations, the minimum value for downward

adjustment, and the provision for possible exemptions, while methodologies must specify appropriate downward adjustment factors (DAF) or quantitative methods for calculating them.

Key requirements

The Baseline Standard (paras 66-74) establishes the following mandatory requirements:

- **Initial downward adjustment:** For baselines determined using the historical/actual emissions approach, a downward adjustment applies from the first calendar year, calculated through the procedure of para 67, which mirrors the structure of the conservative BAU procedure in para 80 (see section 3.3, Figure 7), or through an alternative approach that respects the floor (para 67(b)).
- **Continuous downward adjustment:** For all three baseline approaches (sections 3.1.1, 3.1.2 and 3.1.3), a downward adjustment applies in every calendar year following the start year of the first crediting period unless exemptions are approved by the SBM. The adjustment must increase over time, either annually or stepwise (with intervals of no less than three years). Each increase takes effect from 1 January of the relevant year (para 72).
  In practical methodology design, downward adjustment can be expressed as a numerical coefficient applied to the initial baseline emissions: the Downward Adjustment Factor (DAF). The adjusted baseline emissions in a certain year (BE_{adj,Y_n}) equal the initial baseline emissions multiplied by the DAF for the same year (DAF_{Y_n}). A DAF of 1.00 means no adjustment has been applied; a DAF of 0.90 means the baseline has been reduced by 10% relative to its initial level. Assuming a DAF of 0.99 would be applied in the first year of subsequent downward adjustment, the DAF would decrease by 0.01 each year (i.e. 0.98, 0.97, 0.96, etc.) to fulfil the minimum requirement defined by the Baseline Standard. Para 73 lists five permissible considerations to determine how the DAF is applied in subsequent years: economic viability of the mitigation technology, incentives for less GHG-intensive technologies, established long-term pathways, sufficiency, and suppressed demand. However, it leaves the determination of the DAF beyond the floor value to the methodology proponent (see: “Specification of the DAF above the 1% floor” below).
- **Minimum rate (floor):** The annual increase in the downward adjustment must correspond to at least 1% of the baseline emissions in the calendar year of the start date of the first crediting period (para 74). A pro-rata approach may be used for periods shorter than a full calendar year.
- **Comparison and selection of the crediting baseline**: Regardless of the baseline approach selected, the Baseline Standard (paras 84-87) requires that, for each calendar year of the crediting period, the crediting baseline is the lower of (a) the downward-adjusted baseline and (b) the conservative BAU baseline (cf. section 3.4).

Room for manoeuvre for methodology proponents and activity developers

- Specification of the downward adjustment factor (DAF) above the 1% floor: Methodology proponents can determine a higher DAF above the minimum 1% for continuous downward adjustment. This value does not necessarily need to be defined upfront in a methodology but can be based on a formula to derive the DAF. Michaelowa et al. (2022)[1] propose to link the DAF to the host country's net zero target year (Example 4).

Example 4: Linking the DAF to the host countries' net zero target

The approach proposed by Michaelowa et al. (2022) could be translated to the following generic formula:

$$DAF_{y_n} = 1 - (Y_n - 2021)x\ max(\frac{1}{Y_{net\ zero} - Y_{reference}}, 0.01)$$

Where:

Y_n= calendar year for which the DAF is applied;

$Y_{net\ zero}$= net zero target year of the host country;

$Y_{reference}$ = reference year for the host country's net zero target

The DAF is calibrated to the host country's net zero ambition: a country targeting net zero by 2050 from a 2025 reference would apply a rate of 1/(2050−2025) = 4% per year, while one targeting 2060 would apply 2.9%/year. The max(..., 0.01) clause ensures the minimum 1% annual rate is always respected. The formula "anchors" the start of downward adjustment to a fixed year – 2021 (see below). The advantages and disadvantages of this approach are discussed in section 5.2.

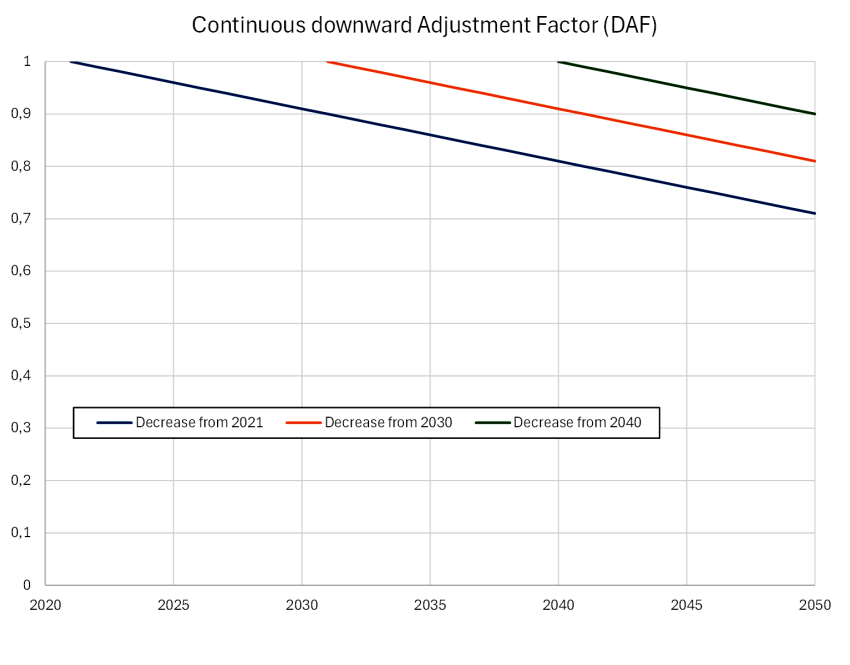
- Calendar-year anchor for start of the downward adjustment: The Baseline Standard links the start of the downward adjustment by default to each activity's crediting period start date (para 71). Consequently, activities registered later under the same methodology apply a lower cumulative adjustment in any given calendar year than identical activities registered earlier. This would favour activities that are registered later. If a common anchor year were used, activities operating in the same calendar year under the same methodology would apply the same DAF, ensuring consistent treatment across the methodology. In practice, this approach should be

[1] A related design was adopted by Gold Standard in its DAF Determination Tool (Gold Standard, 2025a), which fixes 2021 as the reference year, applies the rate as a fixed coefficient for each five-year application period, and sets the applicable DAF at the higher of the national net-zero-derived rate and a peer-group ambition floor. An Absolute DAF Floor of 1.25% applies only where no peer group can be formed, to countries that have already achieved net zero, and to the removal and agriculture activity types listed in Section 5.7.1(c) of the Tool; the median and modal applicable value is 3.45%.

combined with a differentiation of the DAF by technology maturity – for example, higher rates for mature technologies with established decarbonisation pathways and rates closer to the 1% floor for early-stage technologies – to avoid disincentivising innovative (immature or highly costly) technologies. This is in line with para 73 (a and b) of the Baseline Standard, which contemplates larger downward adjustments where GHG-intensive technologies are involved. Methodology proponents thus face two design options: either to follow the Baseline Standard's default that the adjustment increases from each activity's own crediting period start date (paras 71-72), or to use a fixed anchor year.

Example 5: Implications of different DAF anchor years

If no common anchor year is used, the following case is possible: An activity starting in 2021 and applying a 1%/year downward adjustment from its start reaches a DAF of 0.85 by 2035 (year 14 of the crediting period). An activity starting in 2030 under the same methodology would in 2035 – which is only year 5 for that activity – apply a DAF of 0.95. When both activities operate in the same calendar year, in the same sector, and in the same country, the later starting activity applies a less stringent baseline.



Source: Authors.

If the common reference year 2021 were used, an activity starting in 2030 would apply an initial DAF of 0.91 (= 1 − 9 × 0.01) in Year 1 of its crediting period, rather than 1.00. Activities starting in 2035 would begin with a DAF of 0.86; and those starting in 2040 with a DAF of 0.81.

- Application of downward adjustment for removal activities: the requirement to apply the DAF also extends to methodologies for removals. For removals, the DAF must tighten the baseline in the opposite direction to emission reductions: rather than lowering baseline

emissions, it raises baseline removals, so that activities must achieve progressively larger net removals. However, if the baseline is set at zero removals, applying the DAF leaves it at zero, rendering the DAF ineffective. One way to address this would be to require positive removals in the baseline, so that the DAF can take effect. This would be the case if the host country applies a net removal target, i.e. removing a higher quantity of GHGs than it is emitting.

Open questions

- Fixed anchor year for DAF: Until the SBM issues guidance or a mandatory standard regarding the anchor year, methodology proponents should choose between the crediting period start date or a fixed calendar year as the starting point for the application of the DAF. Methodologies submitted to the MEP should explicitly address this choice and justify it.
- Interaction with crediting period renewal: The Baseline Standard requires re-determination of the baseline at each crediting period renewal. How the DAF schedule interacts with a revised baseline at renewal is not specified. If the new baseline is set at a lower level than the original multiplied by the applicable DAF, should the DAF be reset or continue from the level it reached before the crediting period was renewed?

3.3. Conservative BAU baseline

The conservativeness principle ensures that, given inevitable uncertainties in baseline quantification, the crediting baseline stands on the side of caution – avoiding any overestimation of what emissions would have occurred without the activity.

A BAU baseline represents a projection of what would happen under continuation of current practices. BAU projections are inherently uncertain. They rest on assumptions about future technology adoption rates, energy prices, policy enforcement, economic growth, and behavioural patterns, none of which can be known with certainty at the time of baseline determination.

An overestimation of the BAU crediting baseline leads to over-crediting and undermines environmental integrity. This is why the Baseline Standard requires methodologies to demonstrate that the crediting baseline is demonstrably below the BAU level after being adjusted downwards; benchmarks and BAT are by design below BAU in the start year, while the existing actual or historical approach requires downward adjustment from the first calendar year (paras 66-67) and all approaches require increasing adjustment thereafter (para 68).

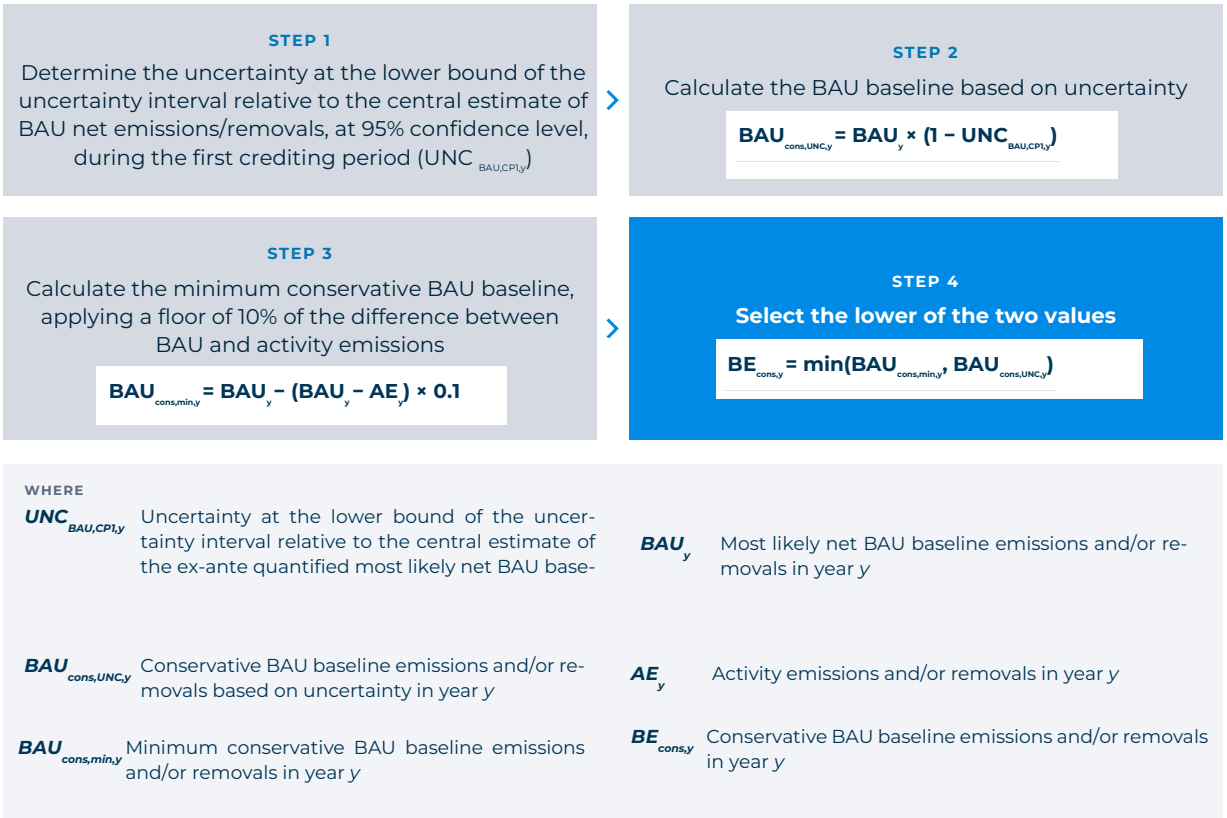
Key requirements

Mechanism methodologies must:

- Apply conservativeness in the selection of the BAU baseline scenario by choosing the most conservative among plausible BAU scenarios, as well as in the quantification of BAU emissions and/or removals by using credible sources and conservative assumptions.
- Include provisions to demonstrate that the downward-adjusted crediting baseline is below the BAU level, by identifying a conservative BAU scenario and providing a method to quantify conservative BAU emissions and/or removals

Figure 7 shows the stepwise uncertainty-based procedure prescribed by the Baseline Standard as the default method for determining the conservative BAU baseline.

Figure 7: Determination of the conservative baseline



Source: Authors, based on UNFCCC 2026a

Step 3 guarantees at least a 10% margin between BAU emissions and estimated activity emissions. The AE_y term accounts for activities that themselves produce some emissions (e.g., energy efficiency projects): where the activity's own emissions are close to BAU, the minimum adjustment is proportionally reduced, reflecting limited mitigation headroom. The formula scales the minimum to the mitigation margin of the activity. For activities with zero activity emissions, the formula simplifies to a 10% reduction from BAU.

The Standard requires this procedure to be applied both ex ante in the PDD/PoA-DD at registration and ex post (in each monitoring report during the crediting period). At each verification, the BAU

scenario and uncertainty parameters may be updated to reflect observed conditions, which can result in a different conservative BAU baseline than the one projected in the PDD/PoA-DD. Methodology proponents should specify which parameters are fixed at registration and which are updated ex post, to provide clarity for both activity developers and Designated Operational Entities (DOEs) conducting verification.

Room for manoeuvre for methodology proponents and activity developers

- Alternative approach to uncertainty quantification: The Baseline Standard permits methodology proponents to propose an alternative approach to determining the conservative BAU baseline, if it ensures the crediting baseline is below BAU and considers the minimum discount of 10%. This offers flexibility to use sector-specific methods where structured uncertainty quantification at the 95% confidence level may not be feasible.
- BAU scenario selection: Where multiple plausible BAU scenarios exist, methodologies may either specify the scenario directly or require activity participants to identify the most conservative one with justification. The standard requires selection of the most conservative plausible scenario; there is interpretive space in defining what constitutes 'plausible'.
- Policy treatment: Methodology proponents have discretion in identifying which sector-specific policies must be reflected in the BAU scenario. The standard distinguishes between: (a) policies formally in force (mandatory inclusion), (b) policies scheduled to take effect during the crediting period (must be reflected unless they integrate the mechanism as an implementation instrument), and (c) general national targets not tied to specific sectors (excluded). The categorisation of a given policy often requires contextual judgement.
- Standardised baselines: For activities in sectors where the SBM adopts standardised baselines in the future (e.g., grid emission factors, once developed), activity developers can directly apply these without independent uncertainty analysis. However, where standardised baselines are not yet available, the full uncertainty quantification procedure must be followed.

Open questions

For methodology proponents:

- How should methodologies address the 95% confidence interval requirement in data-scarce contexts, such as household-level activities or land-use sectors where emissions are highly variable, and measurement data is sparse?
- The standard requires re-determination of the BAU scenario at each crediting period renewal. How should methodologies address the situation where new sector-specific policies enacted during the crediting period fundamentally change the BAU trajectory?

For activity developers:

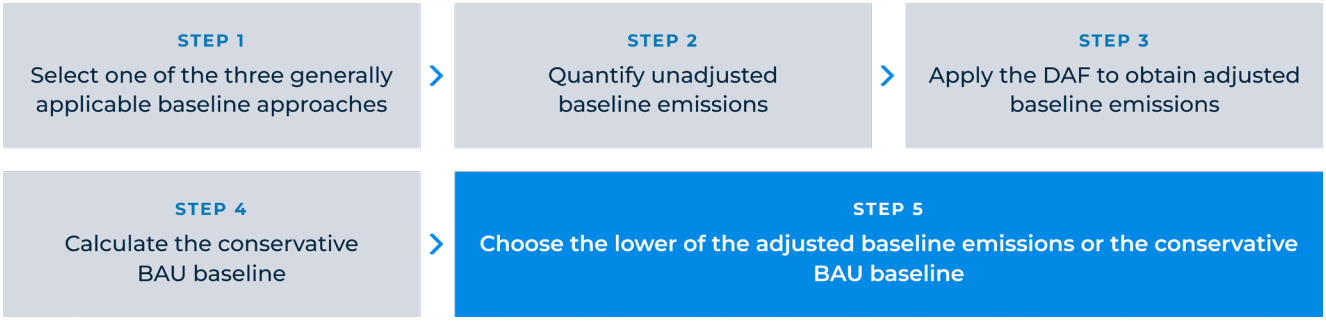
- The policy incorporation requirement means that recently enacted sector-specific policies can significantly reduce the conservative BAU baseline, affecting expected credit volumes. Activity developers need to regularly monitor relevant policy developments in the host country and sector.

3.4. Comparison and selection of the crediting baseline

The three baseline requirements introduced in Sections 3.1 through 3.3 operate sequentially. Understanding their interaction is essential for both methodology design and credit volume projection.

The five-step procedure in the Baseline Standard produces the crediting baseline as follows:

Figure 8: Selection process of the crediting baseline



Source: Authors, based on UNFCCC 2026a

The practical implication is that the crediting baseline is always the minimum of two values: (a) the DAF-adjusted baseline and (b) the conservative BAU baseline. In sectors where the uncertainty discount already produces a steep downward adjustment (e.g., land-use activities with high inter-annual variability), the DAF may be non-binding for several years because the conservative BAU is already lower than the DAF-adjusted baseline. In sectors where the uncertainty discount is small (well-characterised industrial processes with robust data), the DAF becomes the binding constraint from an earlier point.

For activity developers, this means credit volume projections must model both trajectories (the DAF schedule and the conservative BAU trajectory) and select the lower at each year. Modelling only the DAF without the BAU floor, or vice versa, will produce inaccurate projections.

4. CURRENT PRACTICES IN MECHANISM METHODOLOGIES

As of October 2026, five methodologies have been formally approved (AMM001 – landfill gas; AMM002 – N_2O abatement in nitric acid; AMM003 – renewable electricity; AMM004 – cooking energy transitions; and AMM005 – energy efficiency measures in household cooking), and ten methodologies have been designated as Proposed Mechanism Methodologies (PMM) following initial assessment (PMM001 green ammonia, PMM003 pumped hydro, PMM005 savanna fire management, PMM006 fertiliser production, PMM007 HFC recovery, PMM008 leak detection and repair (LDAR), PMM009 low-carbon navigation, PMM010 municipal-solid-waste co-processing in cement, and PMM011 low-carbon hydrogen).

This section reviews the practices adopted by methodology proponents. The review draws on publicly available concept notes, submitted methodology drafts, and MEP assessment reports (UNFCCC, 2026d, 2026e). Across the fifteen methodologies reviewed, baseline setting follows four broad approaches: a combination of approaches (different approaches applied to different activity components), best available technology (BAT), existing actual or historical emissions, and an ambitious benchmark (applied for the first time by a proposed methodology). The downward adjustment clusters into three main types: differentiated DAF rates, use of the minimum DAF of the Baseline Standard (1% per year), and a DAF referenced to the host country's net-zero target or NDC year. Some methodologies do not specify a continuous DAF explicitly but instead rely on structural features to secure conservativeness. Table 1 summarises the approach adopted by each proposed or adopted methodology. Approved methodologies are highlighted in blue.

Table 1: Overview of baseline setting approaches in approved and submitted PACM methodologies

ID	Methodology name	Sector	Baseline approach	Downward adjustment approach[2]
AMM001	Flaring or use of land-fill gas	Waste	**Combination of approaches**	**Differentiated continuous DAF rates (by activity type)**

			• Historical/actual emissions for existing assets
			• BAT for new/greenfield energy components
				• Initial DAF: uncertainty-based (95% CI lower bound / 10% minimum gap)
				• Continuous DAF
				  ○ 1%/yr - energy utilization
				  ○ 5%/yr - small flaring-only
				  ○ 10%/yr - standard flaring

AMM002	N_2O abatement - nitric acid	Industry (Chem.)	**Best available technology**	**Differentiated continuous DAF rates (by plant performance)**
			• 3.99 $kgN_2O/tHNO_3$ for Type 1 & 2 activities • 0.6 $kgN_2O/tHNO_3$ for Type 3 activities (enhancement of existing abatement)	• 1%/yr - best-performers(<0.20 $kgN_2O/tHNO_3$) • 3%/yr - mid-range performers (0.20 – 1.00 $kgN_2O/tHNO_3$) • 5%/yr - poorer performers (> 1.00 $kgN_2O/tHNO_3$)
AMM003	Electricity generation from renewable sources connected to an electricity system	Energy	**Historical/actual emissions**	**Minimum DAF approach**
			• Electricity-system (grid) emission factor via tool A6.4-AMT-007	• Initial DAF = higher of (i) uncertainty at the 95% CI lower bound and (ii) 10% minimum gap toward activity emissions (DA_initial = max of the two) • Continuous: +1%/yr (INDA = 0.01), first applied the year after CP1 start

[2] Where a proposed methodology does not specify a downward adjustment approach the table includes any reason given and specifies how the conservativeness assessment is treated in the methodology.

ID	Methodology name	Sector	Baseline approach	Downward adjustment approach[2]
AMM004	Cooking energy transitions	Energy (Industry/ Demand)	**Historical/actual emissions**	**Continuous DAF (initial = max(Monte-Carlo P10, 10% floor) + 1%/yr)**
			• Baseline cooking energy per person/yr, measured via kitchen performance test (KPT) or continuously tracked energy consumption (CTEC) • fNRB from tool A6.4-AMT-009; wood-to-charcoal default 5:1	• Initial DAF via activity-specific Monte Carlo analysis calibrated to the P10 value; UNFCCC calculator supports determination • Subsequent years: 1%/yr
AMM005	Energy efficiency measures in household cooking	Energy (Industry/ Demand)	**Ambitious benchmark approach**	**No DAF applied (SBM granted exemption)**
			• Weighted-average thermal efficiency of best-performing (top-20th-percentile) comparable cookstoves • Standardised useful energy: 0.001095 TJ/person/yr (charcoal), 0.001277 (fuelwood); conservative BAT backstop caps • fNRB from A6.4-AMT-009; conservative BAU cross-check; benchmark fixed for 5 years	• No initial DAF (ambitious benchmark approach); • Conservativeness via structural discounts: BAT backstop caps, Hawthorne adjustment, usage-share (Ψ) cap, BAU cross-check
PMM001	Green ammonia via electrolysis	Industry (Chem.)	**Combination of approaches (two options)**	**Minimum DAF approach**
			• BAT (greenfield); • Existing actual/historical (retrofit)	• Initial DAF: Year-1 four-step uncertainty (higher of 95% CI lower bound and 10% gap) • Continuous: fixed 1%/yr of the Year-1 baseline
PMM003	Pumped hydro storage	Energy	**Historical/actual emissions**	**No DAF applied**
			Actual emissions based on hourly dispatch emission factor ($EF_{PM,h,d,y}$) projected from 3–5yr trend	• Single-value DAF not feasible (BAU and baseline are 7,860+ hourly EF values)

ID	Methodology name	Sector	Baseline approach	Downward adjustment approach[2]
				• Conservativeness via Conservativeness Factor CF = 90% and net baseline = min(BAU, conservative baseline) • Declining projected margin EF (3–5-yr trend) reflects grid decarbonisation, re-projected at each renewal
PMM004	CLEAR - cooking energy transitions	Energy demand	**Combination of approaches**	**No DAF applied**

			• Historical/actual emissions (measured via kitchen performance test (KPT)/ continuously tracked energy consumption (CTEC)
			• BAT where global default baseline values are used
				• Conservativeness via structural discounts:
				  ○ Project technology days (PTD) claim ≤75% of maximum (≤90% with full customer-support actions; cap waived with SUMs)
				  ○ 75% Hawthorne Effect multiplier (or SUM-measured)
				  ○ 2% leakage deduction

PMM005	Savanna fire management	AFOLU	**Historical/actual emissions**	**Minimum DAF approach**
			• ≥7-yr historical reference period	• Year 1: uncertainty-based (95% CI lower bound / 10% minimum gap) • Subsequent years: progressive ≥1%/yr (firm minimum)
PMM006	Fertilizer production with renewables-based ammonia	Industry / Agriculture	**Combination of approaches**	**DAF calculated based on host country net-zero target year**

			• BAT (greenfield + brownfield post-lifetime)
			  ○ Default 2.16 tCO_2e/tNH_3 (valid to 2030)
			• Historical/actual emissions (brownfield within remaining lifetime)
				• BAT: no / Initial DA for historical/actual emission approach: default value
				• continuous downward adjustment:
				  ○ DAF = 1 − (Y_n − min(Y_{CP1}, 2033)) × max(1/($Y_{netzero}$−Y_{ref}), 0.01); or
				  ○ Default 3%/yr if no host-country net-zero year

ID	Methodology name	Sector	Baseline approach	Downward adjustment approach[2]
PMM007	Recovery and plasma-based destruction of residual HFCs	Chemicals / Refrigerants	**Historical/actual emissions** • Kigali Amendment phase-down incorporated in BAU	**Minimum DAF approach** • Initial DA: min(95% CI, 10% floor) • Continuous DA: Increases the prior year's adjustment by 1 percentage point annually ($BE_{adj,y(n)} = BE_{act/hist,y1} \times (ADJ_{y(n-1)} + 1\%)$)
PMM008	Leak detection & repair (LDAR) in gas transmission/distribution	Energy	**Historical/actual emissions** • Actual volumetric CH_4 measured per physical leak, component-by-component, at the lower bound of the 95% CI measurement-uncertainty range.	**DAF calculated based on host country NDC yNDCyear** • Year 1: uncertainty-based (95% CI lower bound / 10% minimum gap) • Applies from Year 1 (historical approach) • Subsequent years: DAF = higher of (i) NDC-derived rate (unconditional component) and (ii) a 2%/yr default where no/weaker NDC applies (double the 1% standard minimum)
PMM009	Low-carbon navigation routing for passenger vehicles	Transport (road)	**Historical/actual emissions** • Baseline EF from Worldwide Harmonized Light Vehicles Test Cycle (WLTC) combined fuel-consumption values weighted by city fleet across engine-displacement categories; updated annually ex post.	**Default DAF approach** • Year 1: minimum 10% gap (no separate uncertainty discount) • Subsequent years: cumulative +1%/yr (INDA = 1%; BEadj,y = BEhistory,y − [DAy1 + BEhistory,y × 1% × (y − y1)])
PMM010	Partial substitution of fossil fuels by MSW in cement manufacture	Industry (cement)	**Historical/actual emissions** • Existing-asset weighted-average fossil-fuel emission factor over the 3 years pre-project (lowest of three EFs) • Avoided waste CH_4 (conservativeness factor 0.73)	**Minimum DAF approach** • Initial DAF: more conservative of 95% CI lower-bound uncertainty and 10% minimum gap • Continuous: adjustment must increase over time (annual or ≤3-yr stepwise); no fixed rate specified • Separate NDC-aligned regulated-adjustment-factor (RAF) BAU ceiling check

ID	Methodology name	Sector	Baseline approach	Downward adjustment approach[2]
PMM011	Low-carbon-intensive hydrogen via water electrolysis	Industry (Chem./Energy)	**Combination of approaches** • BAT (greenfield): SMR/ATR with CCS, ~3–4 tCO_2e/tH_2 • Existing actual/historical (brownfield/retrofit): ≥3 yrs data; SMR 9–12, coal 18–20 tCO_2e/tH_2	**DAF based on host country net-zero target year** • Initial DAF (brownfield): lower of 95% CI lower-bound uncertainty and 10% minimum gap; greenfield: no Year-1 uncertainty adjustment • Continuous: DAF = $1 - (Y_n - Y_1) \times \max(1/(Y_{netxero} - Y_{rex}), 0.01)$; default 1%/yr where no net-zero target

A review of baseline practices across the fifteen methodologies reveals five generic patterns:

Prevalence of the historical/actual approach: Thirteen of the fifteen methodologies use existing actual or historical emissions, as the sole approach or in combination; six (AMM001, AMM002, PMM001, PMM004, PMM006, PMM011) apply BAT (pure or combined); and one – AMM005 – applies an ambitious benchmark. Most of these combined approaches consistently apply BAT/defaults to greenfield or new capacity while using historical/actual emissions for existing or retrofit assets. Only AMM002 relies on a pure BAT baseline, tied to fixed performance benchmarks ($kgN_2O/tHNO_3$). AMM005 is the first to use an ambitious benchmark, setting the baseline at the weighted-average efficiency of the best-performing (top-20th-percentile) comparable cookstoves.

DAF specification: AMM002, PMM006, PMM007, and PMM008 have explicitly specified DAF: AMM002 has three tiers (1, 3 and 5%); PMM011 ties the DAF to the host country's net-zero target year; PMM006 applies a net-zero-target-referenced formula (minimum 1%/year; default 3%/year absent a host-country net-zero year), while PMM007 codes an annual increment of (ADJ_y(n-1) + 1%). Most others defer rate specification to MEP assessment. This creates financial uncertainty for activity developers who cannot model credit trajectories during project preparation, and the possibility of inconsistent ambition levels across sectors.

CDM legacy alignment: Legacy CDM methodologies may require substantial revisions to meet the PACM's baseline-setting requirements. This is evident in the approved version of AMM001, AMM003, AMM004, AMM005 and the ongoing MEP assessments of PMM004, and PMM008, all of which draw on CDM methodologies. For example, AMM001 replaces the single-scenario, static baseline approach used in CDM methodology ACM0001 with a differentiated, component-level process that requires downward adjustment and comparison against a conservative BAU scenario. The two, now-adopted household-cooking methodologies (AMM004 and AMM005) likewise build on CDM cookstove methodologies (AMS-I.E and AMS-II.G). Proponents should therefore allow sufficient time and resources to reassess baseline assumptions, data requirements, and methodological structure rather than treating the transition as a straightforward update. PMM007, which has no CDM precedent, also shows that the PACM can accommodate activity types not previously covered under the Kyoto mechanisms, such as specialised refrigerant management.

Top-down standardisation potential: The SBM has indicated plans to develop sector standardised baselines (e.g., grid emission factors, fuel-switching benchmarks). The fifteen reviewed methodologies are early candidates for integration with such baselines as the PACM matures. AMM002's declining default EF schedule is a methodology-level implementation of this concept and may serve as a model for other high-volume industrial sectors with well-characterised technology performance data.

Host country roles in the adjustment: The Baseline Standard gives host Parties two formal channels to shape baselines and adjustments in their territory: designating BAT as the mandatory

approach for a sector (para 40) and submitting standardised baselines, which may standardise baseline setting, quantification, or individual parameters (para 36(c)). A host country could accordingly propose sector-differentiated adjustment schedules through the standardised baseline route. None has done so to date.

5. IMPLICATIONS FOR ARTICLE 6.4 ACTIVITY DEVELOPMENT AND IMPLEMENTATION

5.1. Applicable baseline setting approaches

If BAT is chosen and justified or must be chosen because the host Party has designated BAT as the default approach for the sector or activity type (para 40), methodology proponents and activity developers should consider the following:

- The narrower the baseline geographical reference area is defined, the greater the likelihood of differences in emissions intensities of different BATs under the same baseline methodology. Overall, conservativeness of the baseline depends on the weighted average of the emissions intensities of the different BATs applied. It is likely that a baseline methodology using the BAT approach leads to a more conservative baseline if the geographical scope is defined broadly in the methodology, rather than the methodology enabling many narrowly defined BATs. In fact, para 19 of the standard identifies standardisation as a safeguard against the selection bias that narrow definitions invite.
- Methodology proponents should consult the host Party Designated National Authorities (DNAs) during the methodology design phase to understand whether they require a BAT (para 37), since this would determine the baseline approach.
- For the economic-viability and validity-period parameters discussed in Section 3.1.1, methodology proponents should fix conservative cost, discount-rate and finance-access assumptions ex ante and keep the BAT validity period short, noting that methodology validity may not exceed five years in any case (in line with the general revision cycle) to avoid a perverse incentive to lock in an outdated BAT.

If an ambitious benchmark is chosen and justified, methodology proponents must justify the percentile choice up to the 20th percentile ceiling (para 55(h)); it is currently untested whether the MEP will press for stricter percentiles where data would support them. The energy-efficiency measures in household cooking methodology (AMM005) is the first in the pipeline to apply this approach, so proponents now have one assessed precedent for percentile selection. Data vintage discipline (no more than three years before PDD consultation, para 58) should drive the design of the data collection procedure. Given the limited precedent, proponents applying the ambitious benchmark approach should transparently document and justify key methodological choices. Where alternative

approaches are used to determine the benchmark, proponents should demonstrate that the resulting baseline is conservative and consistent with the requirements of the Baseline Standard.

If an approach based on actual or historical emissions is chosen and justified:

- The remaining lifetime cap (para 61) limits baseline validity for equipment-replacement activities and should be quantified conservatively at PDD/PoA-DD stage. Where historical data show a declining trend, para 64(a) requires performance improvement factors; proponents should specify these in the methodology rather than leaving them to activity participants, to reduce validation risk. However, how to estimate lifetime in sectors where depreciation schedules and operational norms vary widely is not yet established. A conservative approach would be to apply the minimum lifetimes specified in the "Methodological tool - Determination of the technical lifetime of equipment (UNFCCC, 2026f).
- The Baseline Standard requires re-determination of the baseline at each crediting period renewal. For methodologies using historical/actual emissions, the re-determination of the baseline is complex: it requires fresh data, potentially a revised BAU scenario incorporating policies enacted since registration, and recalculation of conservativeness margins. This contrasts with methodologies with embedded declining parameters (e.g. AMM002's emission factor schedule) or technology-dependent benchmarks (e.g. PMM003's grid emission factors), where the update mechanism is straightforward. Case studies like the retirement of HFO steam boilers and replacement with high-efficiency biomass boilers (see Example 3), however, show that the historical/actual emissions approach to baseline setting is clear when it is grounded in verifiable site-specific data, and well-suited to retrofit or replacement activities where the equipment being displaced has a documented emissions history. It avoids reliance on technology benchmarks that may be difficult to apply in contexts where the activity is site-specific, and the sectoral technology mix is heterogeneous.
- In sectors with suppressed demand (e.g., households currently lacking access to modern energy services), the historical approach may understate the BAU trajectory if baselines are calculated in absolute, not intensity terms. Activity developers need guidance on how suppressed demand should be reflected in the baseline scenario selection.

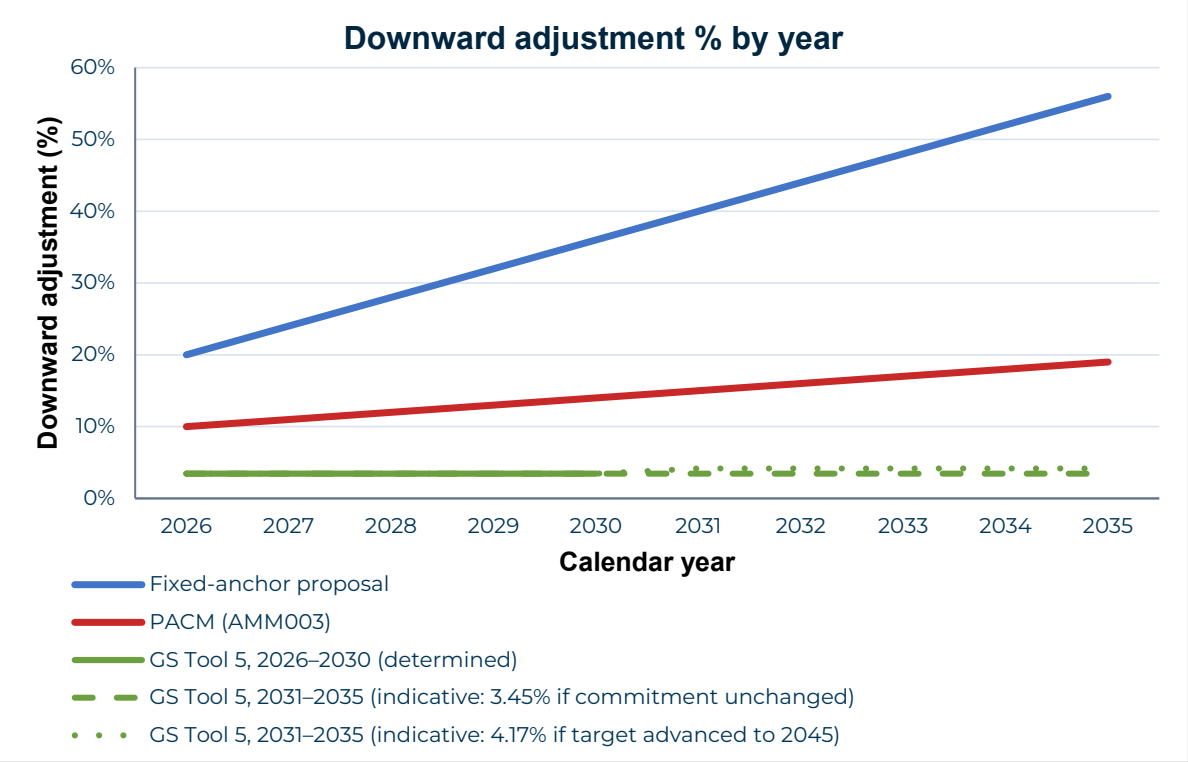
5.2. Determining the downward adjustment factor

The current framework delegates DAF determination to individual methodologies, producing heterogeneous outcomes across sectors. To avoid significant and often arbitrary differences between activity types, methodology proponents and activity developers would benefit from sector-tiered default DAFs that the SBM could develop, giving them a clear default to adopt or a defined basis against which a different approach would have to be justified. The AMM002 declining N_2O emission factor schedule would be an appropriate precedent. Minimum floors (1%/year per the Baseline Standard) should be maintained, with indicative rates differentiated by technology readiness: 2–4%/year for mature technologies with established decarbonisation pathways; rates closer to the

minimum for early-stage industrial deep-decarbonisation technologies (para 73(a)) where the investment case for carbon finance remains critical.

Where the DAF formula is linked to a host country's net-zero target year, methodology proponents face a challenge if a host country has not announced a net-zero target or does not differentiate its NDC according to sectors, since no clear reference rate is available. Methodology proponents would benefit from SBM guidance, especially since this gap disproportionately affects LDCs and SIDS. Without default rates or comparison group mechanisms, projects in geographies in which carbon finance is most needed face the highest regulatory uncertainty. The Gold Standard DAF Determination Tool (Gold Standard, 2025a) provides a potential model for PACM standardisation, as it addresses this through a comparison group approach that establishes ambition floors for country groupings.

To illustrate how these design choices play out in practice, three DAF mechanisms are compared on a common basis (flat pre-adjustment baseline of 100,000 tCO_2e per year, crediting period starting 1 January 2026, host country net-zero target of 2050): (i) a fixed-2021-anchor approach proposed by Michaelowa et al. (2022), with the annual rate differentiated by technology maturity, applying the mature-technology rate of 4% per year; (ii) the approach of the approved AMM003 methodology, with an initial adjustment at the higher of the uncertainty-based value and the minimum guaranteeing a 10% gap to activity emissions, increasing by one percentage point per year from the year after the start; and (iii) the Gold Standard DAF Determination Tool, under which a fixed coefficient derived from the host country's net-zero year, subject to peer-group ambition floors, is applied unchanged to each calendar year's pre-adjustment baseline within a five-year application period (Gold Standard, 2025a).



The three produce different trajectories as shown in the figure above. The fixed anchor proposal is the steepest, rising from 20% in Year 1 to 56% in Year 10, because it counts cumulatively from 2021 regardless of the activity's start date. AMM003 starts near 11% and climbs to 19%, counting from the activity's own start. The Gold Standard adjustment is 3.45% in each year of the 2026-2030 application period, applied in full of the first year; the 2031-2035 coefficient will be re-determined on the NDCs and long-term strategies due in 2030 and rises only if the host country advances its net-zero commitment or the peer-group floor increases. This is by design: ambition is delivered through the five-yearly re-determination of the coefficient in step with the NDC cycle, through peer-group floors and through the separate conservative BAU layer, rather than through intra-period escalation (Gold Standard, 2025a and 2025b). For PACM methodologies applied under GS4GG, the downward adjustment of the PACM methodology prevails, and the Tool is not applied (Gold Standard, 2025a, para 4.1.2(b)). The comparison shows that the architecture of a DAF mechanism, whether it accumulates from a fixed year, accumulates from the activity start, or applies a flat per-period coefficient, shapes credit volumes more than the headline annual rate. Gold Standard has indicated that a formal clarification on the application of the Tool will be published in due course; the characterisation above rests on the published documents referenced.

Methodology proponents choosing a common fixed anchor year should justify it by reference to consistent treatment of activities operating in the same calendar year; proponents following the standard's default (adjustment from each activity's own crediting-period start date) do not need additional justification, but should be aware that this results in identical activities with different start dates applying different DAFs in the same calendar year, which then provides an advantage to projects starting later, as discussed above. The choice should be stated explicitly in the methodology. The calendar-year anchor for the DAF should be adopted as a standard feature to prevent competitive distortions favouring late-starting activities. Resolving uncertainties and addressing heterogeneity around the determination of the DAF is important as DAF determination has material implications for activity developers' financial planning and risk assessment:

- Activity developers must model the DAF trajectory over the full crediting period. Under a 1%/year DAF anchored to a common fixed year of 2021, an activity starting in 2030 already applies a 9% discount in its first crediting year (2030 − 2021 = 9 years); by 2040 the cumulative discount reaches 19% (2040 − 2021 = 19 years). Under a 2%/year DAF with a common fixed anchor year, an activity starting in 2030 faces an 18% discount in Year 1; by year 10 (2040) the discount is 38%. Revenue modelling should incorporate these reductions to avoid optimistic credit volume projections.
- If a technology is classified as 'emerging' at registration but matures faster than expected, the methodology may be revised to apply the 'mature' DAF schedule. Any such revision would take effect only from a subsequent crediting period (for example at renewal), not during an ongoing crediting period, and the implications of methodology changes under the

PACM should be verified. Projects should assess the sensitivity of their financial models to potential tightening of the DAF scheduled at crediting period renewal.

For baselines based on BAT or an ambitious benchmark only, an exemption may be approved by the SBM where the adjustment would eliminate all calculated emission reductions or net removals (paras 68-69). No equivalent pathway exists for the historical/actual approach. In practice, the SBM granted exactly such an exemption to AMM005 at SBM 023, the first instance of this provision being applied. The evidence requirements, timelines, and likelihood of approval for such exemptions are not yet publicly elaborated, creating planning uncertainty and remain to be established through practice.

5.3. Conservative BAU baseline and interaction with downward adjusted baseline

Conservative BAU baseline and the downward adjustment are not alternatives but a two-part test to be built into the methodology. As the crediting baseline in any year is the lower of the downward-adjusted baseline and the conservative BAU baseline (paras 84-87), a methodology that specifies an ambitious downward-adjustment trajectory can still be constrained by the conservative BAU in sectors where uncertainty is high. Proponents should therefore define both the conservative-BAU procedure and the downward-adjustment schedule explicitly, and state which parameters are fixed at registration, and which are re-determined ex post.

Activity developers face the practical consequence that credit-volume projections must model both trajectories and take the lower value in each year; modelling only the downward adjustment, or only the conservative BAU, will overstate expected issuance. Where the conservative BAU is the binding constraint – for example in land-use or other activities with high inter-annual variability – a more ambitious downward-adjustment rate will not increase crediting, so activity developers should test the sensitivity of their financial models to the uncertainty deduction as well as to the DAF.

5.4. Methodology availability and shared data infrastructure

Submitted methodologies differ widely in their replication potential. Some address activity types with a narrow range of potential applications globally, such as PMM003 (pumped hydro storage) and PMM007 (HFC recovery), while others cover high-volume categories with large existing demand. This spread demonstrates the PACM's openness to diverse sectors. It also carries practical implications for methodology proponents and activity developers. Methodology proponents should expect assessment attention to concentrate on activity types with high replication potential, and methodologies catering to narrower activity types should plan for longer assessment timelines. Activity developers in high-volume categories inherited from the CDM (grid-connected renewables, waste management, industrial energy efficiency) currently face a gap between demand and

approved PACM methodologies; early bottom-up submissions in these categories will shape the defaults that later entrants apply.

Beyond the choice of activity type, a second structural factor shapes how much design work an individual proponent faces: the availability of shared data infrastructure. Several baseline parameters depend on regional or national data: grid emission factors (PMM003), non-renewable biomass fractions (PMM004), waste composition profiles (AMM001), and industrial performance benchmarks (AMM001, PMM006). Where each methodology derives these independently, inconsistencies emerge across projects operating in the same country and sector. Methodology proponents should engage with host Parties to develop validated regional default values, starting with the parameters most used. This would improve baseline consistency across the PACM.

5.5. Outlook

The fifteen methodologies reviewed represent the first generation of PACM baseline design. As more methodologies are submitted, assessed, and applied to real projects, several unresolved questions will demand SBM attention: a common fixed anchor year for the DAF, interaction between DAF and crediting period renewal, exemption pathways for activities where the full downward adjustment would eliminate all credited reductions, the treatment of removals baselines, and the application of the Suppressed Demand Standard to baseline setting in household-level activities.

The speed at which these questions are resolved will determine the attractiveness of the PACM as a crediting mechanism and its ability to achieve a relevant scale within the 2026–2028 window. Convergence across different carbon market actors developing and approving baseline methodologies on key design parameters (particularly the 2021 anchor year and linking the DAF formula to net-zero pathways) suggests the market is coalescing around a shared analytical framework. Whether the SBM formalises this convergence into binding provisions will determine how much design freedom methodology proponents retain in the next generation of submissions.

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Perspectives
Climate Research gGmbH
Hugstetter Str. 7
79106 Freiburg, Germany
info@perspectives.cc
www.perspectives.cc