ARTICLE 6.4 MECHANISM

A6.4-MEP014-A04

Draft Mechanism methodology

Energy efficiency measures in household cooking

Version 02.0

Sectoral scope(s): 03

United Nations
Framework Convention on
Climate Change

COVER NOTE

1. Procedural background

1. The Supervisory Body of the mechanism established by Article 6, paragraph 4, of the Paris Agreement (the Supervisory Body), at its fifteenth meeting (SBM 015), approved the workplan for 2025 for the Methodological Expert Panel (MEP) and requested the MEP to initiate work on the revision of CDM methodologies, methodological tools, standards, and guidelines, including the methodologies "AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass" and "AMS-I.E: Switch from non-renewable biomass for thermal applications by the user" (hereinafter referred to as "the approved CDM methodologies").[1]

2. In parallel, the MEP received on 12 May 2025 a proposed new mechanism methodology "PMM004: Comprehensive Lowered Emission Assessment and Reporting (CLEAR) Methodology for Cooking Energy Transitions" (hereinafter referred to as "PMM004"). A public consultation on PMM004 was open from 16 June 2025 to 06 July 2025, and a total of 16 submissions were received.

3. The MEP at its seventh meeting (MEP 007), noted that the consideration of the proposed new mechanism methodology PMM004, including public comments received on this submission, could potentially be merged with the top-down revisions of the aforementioned approved CDM methodologies and agreed to continue working on the revision of the methodologies at its next meeting.[2]

4. The MEP 011, considered the PMM004 submission together with the CDM methodologies "AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass" and "AMS-I.E: Switch from non-renewable biomass for thermal applications by the user" and agreed to continue working on the revision.[3]

5. The MEP 012, continued considering the PMM004 submission together with the CDM methodologies "AMS-II.G: Energy efficiency measures in thermal applications of non-renewable biomass" and "AMS-I.E: Switch from non-renewable biomass for thermal applications by the user" and agreed to continue working on the revision.[4]

6. The MEP 013, considered a draft version of a mechanism methodology with a scope similar to the CDM methodology "AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass". This draft mechanism methodology incorporates components of the proposed PMM004 mechanism methodology and further components developed by the MEP to align with the requirements of approved Article 6.4 mechanism standards for the development of new mechanism methodologies, while also incorporating

[1] See https://unfccc.int/sites/default/files/resource/A6.4-SBM015.pdf.

[2] See https://unfccc.int/sites/default/files/resource/MEP007_Meeting_report.pdf.

[3] See https://unfccc.int/sites/default/files/resource/A6.4_MEP011.pdf.

[4] See https://unfccc.int/sites/default/files/resource/A6.4-MEP012.pdf.

significant simplifications for users of the mechanism methodology. The MEP launched a call for input on this draft methodology. In parallel, the MEP continued considering the PMM004 submission together with the CDM methodology “AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user” with the aim of considering at a future meeting, a second draft mechanism methodology for cooking activities with a different scope.

7. The MEP 014 considered the comments received from the stakeholders. A summary of how these comments were addressed in the draft mechanism methodology is provided in section 4 of this cover note. Based on the comments, the MEP finalized the draft mechanism methodology and recommended that the Supervisory Body adopt the mechanism methodology.

2. Purpose

8. The purpose of this mechanism methodology is to define the procedures, requirements, and guidelines for developing and monitoring Article 6.4 activities that involve the distribution and operation in rural areas of improved cookstoves for fuelwood or charcoal where the fuels remain the same between the baseline and the activity scenarios.

3. Key issues and proposed solutions

9. The following sub-sections outline the key elements of the mechanism methodology, including a comparison of the elements with the approved CDM methodology “AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass”.

3.1. Applicability conditions

10. This mechanism methodology applies to activities that distribute and operate improved biomass cookstoves in households located in rural areas where the target population is at or below an applicable poverty threshold, where emission reductions are achieved through higher thermal efficiency compared to baseline cookstoves. Locations described by these conditions frequently share characteristics related to cooking practices and fuel types that permit simplification for eligible activities due to standardization at the methodology level related to additionality demonstration, determination of baseline scenario and baseline emissions, downward adjustment, determination of conservative business-as-usual (BAU), leakage and uncertainty analysis.

11. The mechanism methodology is applicable only where baseline cooking relies predominantly on fuelwood or artisanal charcoal, meaning these fuels must be used on average for at least 75 per cent of the cooking events in the households. The primary fuel type shall remain unchanged between baseline and activity scenarios. The mechanism methodology is not applicable to activities that involve fuel switch between the pre-activity scenario and activity. Fuel switch activities will be included in a separate mechanism methodology, as described in paragraph 6. The mechanism methodology is designed to be used on a standalone basis, but future methodologies could refer to applying it in combination if they address areas of potential interaction appropriately.

12. Cookstoves distributed by Article 6.4 activities, called “project cookstoves” in this mechanism methodology, shall be appropriate to local cooking needs. Ancillary use of project cookstoves for space heating requirements, e.g. under seasonal variation, does not exclude them from applying this mechanism methodology but conditions are provided to

ensure the emissions reductions quantification focuses on cookstove use for cooking events. Each cookstove shall be uniquely identified and traceable at the household level. All cookstove models shall be tested for thermal efficiency in accordance with either (i) ISO 19867-1:2018 – Clean cookstoves and clean cooking solutions — Harmonized laboratory test protocols (or any subsequent revision thereof), which is a widely accepted and applied standard for laboratory tests of biomass cookstoves for energy efficiency and other operational characteristics, or, (ii) where an accredited laboratory with this capacity is not available in the host country, equivalent national standards. Project cookstoves must meet minimum thermal efficiency thresholds (20 per cent for plancha-type stoves, 25 per cent for other wood-burning stoves, and 30 per cent for charcoal stoves).

13. The mechanism methodology applies to project-level activities and programmes of activities (PoAs).

14. The mechanism methodology is based on the CDM methodology “AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass” while also incorporating components of PMM004, but only those related to the scope of the CDM methodology. The following Table outlines the main differences in applicability conditions between the two methodologies:

Table. Comparison of applicability conditions between the CDM methodology and the Article 6.4 mechanism methodology

	CDM Methodology (AMS-II.G)	Draft Article 6.4 mechanism methodology
Overall scope	Applies broadly to efficiency improvements in biomass thermal applications (households, institutions, etc.)	Applies to distribution and operation of improved biomass cookstoves for efficiency improvements in households
Target population	Does not explicitly include or exclude a certain category of population; Deemed to be eligible for rural, peri-urban and urban region	Restricted to rural locations, where the income levels are demonstrated to be below an applicable poverty threshold
Target usage	The use of biomass thermal applications includes cooking (household, institutional, etc) and other uses such as drying	The use of the biomass stoves is limited to cooking events in households
Baseline fuel condition	Requires use of non-renewable biomass in the project region, with no quantitative threshold	Requires >75 per cent use of fuelwood or artisanal charcoal, fuel switching is excluded
Technology type	Cookstoves, ovens, dryers, including retrofits	Improved biomass cookstoves
Minimum efficiency	Minimum 25 per cent efficiency for cookstoves; multiple testing approaches	Differentiated thresholds: 20 per cent (plancha), 25 per cent (wood), 30 per cent (charcoal); mandatory ISO (or equivalent) testing
Technology penetration	Used for additionality only (≤2.5 per cent sales or ≤1.5 per cent stock thresholds)	A performance-based approach for additionality is included. As an applicability condition, no more than 4.5 percent of existing cookstoves in the target population

	CDM Methodology (AMS-II.G)	Draft Article 6.4 mechanism methodology
		may be at least as efficient as the project cookstoves
Fuel consistency	Fuel switching is excluded.	Primary fuel type must remain unchanged between baseline and activity; fuel switching is excluded
Cookstove lifetime	Lifetime must be documented, no fixed limit	Lifetime must be documented, no fixed limit; expectation that lifetimes will generally be ≤10 years
User needs / suitability	Not specified	Requires demonstration that technologies meet local cooking needs
Identification and tracking	Requires unique identification and tracking to avoid double counting	Requires unique identifiers linked to households and a management system; Requires declaration of consent by participating households that also prevents double counting
Replacements/ repairs	Allows replacement/repair and continued eligibility	Requires repair/replacement or exclusion from emission reduction claims, with documented plan
Scale of application	Applicable to project activities and PoAs	Applicable to project activities and PoAs
Combination with other methodologies	Allowed	Standalone use (unless other methodologies explicitly allow combination)
Project Scale	≤60 GWh/year energy savings limit, (small scale)	The mechanism methodology does not limit applicability via scale or total achieved net greenhouse gas (GHG) emissions reductions
Historical biomass use requirement	Requires biomass use in region since 31 December 1989	Not specified
Consideration of reversal risk	Not included	Includes provisions for addressing reversal risks in the reservoir affected by the activities
Uncertainty	Not addressed	Analysis at the mechanism methodology level confirms that resulting emissions reductions are very unlikely to be overestimated

3.2. Activity boundary

15. The activity boundary encompasses (i) the physical and geographical locations where project cookstoves are distributed and operated, and (ii) the locations from which biomass fuels (fuelwood or charcoal) are produced or collected in both the baseline and activity scenarios.

16. The geographical site of the Article 6.4 activity is different from the location where the fuels are collected or produced.

17. Within this boundary, emissions sources include fuel combustion for cooking (CO_2, CH_4, N_2O) and upstream emissions from charcoal fuel production, which are accounted for in both baseline and activity scenarios. Emissions from fuel transport are excluded, as the activity reduces fuel consumption without altering fuel types, meaning that this is a conservative assumption.

18. Relevant GHG reservoirs for both the baseline and activity include above- ground woody biomass in the landscape, as this is assumed to be the primary source of harvested biomass. Therefore, CO_2 emission reductions from the reduction in use of biomass fuels affect a GHG reservoir subject to reversal risks and are addressed as such in this mechanism methodology. Biochar and potential removals related to any biochar that is produced from gasifier stoves are not quantified and, therefore, biochar has been excluded as a reservoir source. This is a conservative approach. Reductions in emissions of CH_4 and N_2O from biomass combustion do not have reversal risks.

19. The geographical scope of the boundary related to fuels is defined using subnational, national, or multi-national delineations based on the source and supply chains of the fuelwood or charcoal, consistent with parameters from the related methodological tools that also are under development. Activity participants are required to clearly specify separately both the cookstove deployment areas, using geospatial data (e.g., KML), and fuel sourcing locations.

3.3. Demonstration of additionality

20. The mechanism methodology requires activity participants to demonstrate additionality by conducting a regulatory analysis, where activity participants review current legal requirements and confirm that the legal requirements (for example, environmental and energy legislation) do not require the implementation of the Article 6.4 activity directly or indirectly. As part of this analysis, activity participants also identify and evaluate any government subsidies or public support schemes related to clean cooking. The presence of such subsidies shall not automatically render an activity ineligible. However, when these exist, the activity participants shall use an investment analysis to demonstrate that any existing or reasonably expected public support is insufficient to make the activity financially viable or to enable its implementation in the absence of Article 6.4 mechanism revenue. The fulfilment of this condition ensures that the other standardized components of additionality demonstration are valid. The regulatory analysis shall be updated in each monitoring report and at renewal of crediting period.

21. The risk of lock-in is standardized at the mechanism methodology level given that the mechanism methodology is applicable to improved cooking technologies that generally have a technical lifetime of no more than 10 years; therefore, the mechanism methodology assumes that no lock-in risk exists for eligible improved cookstoves, and its validity expires on 31 December 2030 (as opposed to 5 full years from its approval). When the methodology is revised in the future prior to the end of its validity period, the assumptions and conditions related to lock-in risk will be reevaluated.

22. The mechanism methodology applies the performance-based approach for additionality demonstration through standardized thermal efficiency performance benchmarks for household cooking technologies in rural, low-income settings. The performance-based approach is developed in fulfilment of the applicability conditions and requirements of section 6.6 of the "Standard: Demonstration of additionality in mechanism methodologies" (A6.4-STAN-METH-003). (hereinafter referred to as "Additionality Standard") The

approach assumes that cooking with fuelwood or charcoal in low-income households serves a common purpose - providing thermal energy for cooking events (e.g. cooking a meal, preparing beverages, or heating water) - which can be consistently compared across households using measurable performance indicators. Drawing on empirical evidence and peer-reviewed research, the methodology defines efficiency thresholds (16.6 per cent for fuelwood and 27.4 per cent for charcoal) to distinguish improved cookstoves from baseline practices. These thresholds are set to ensure a high likelihood of additionality (at least 90 per cent), reflecting the low rates of autonomous adoption of improved cookstoves in similar contexts, particularly in the absence of public sector subsidies. Rationale and references for the threshold values for the thermal efficiencies are detailed in Appendix 7.

23. Since a performance-based approach is applied, a common practice analysis is not included, in line with paragraph 20 of version 01.2 of the Additionality Standard.[5] Nevertheless, the mechanism methodology also requires existing cooking practices to be assessed, using the pre-activity survey, to confirm consistency with the assumptions used to define the performance-based thresholds.

24. The mechanism methodology provides specifications to ensure that the demonstration of additionality can be applied rigorously both by individual Article 6.4 activities and by component projects (CPs) in Article 6.4 PoAs.

3.4. Identification of the baseline scenario

25. The mechanism methodology provides requirements for describing the pre-activity scenario in line with paragraph 10 of version 01.0 of the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004) (hereinafter referred to as “Baseline Standard”) that represents the conditions prevailing prior to the implementation of the Article 6.4 activity and is established through a representative pre-activity survey of the target population.[6] The survey identifies key parameters including existing cooking technologies and their fuel types and relative use, as well as household size and characteristics.

26. It also may include an assessment of the presence of cooking technologies with efficiency equal to or higher than the project cookstoves, in order to determine whether their penetration does not exceed the threshold of 4.5 per cent that relates to the performance-based approach for additionality, although this also may be evaluated using literature sources. Specifically, activity participants shall evaluate the percentage of households in the target population with a functional cooking technology that is assessed to have the same or a higher efficiency as the project cookstoves to demonstrate compliance with the applicability condition.

27. The survey results, relating to the identification of the pre-activity scenario, are cross-checked against recent, credible external data sources. The survey also informs the design of the monitoring approach and may be used to demonstrate alignment of the selected technologies with local cooking needs. As a hypothetical example, the survey could demonstrate that households prefer cooking outside due to heat concerns and hence a project cookstove without a chimney could be appropriate.

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[5] See https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-003.pdf.

[6] See https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-004.pdf.

28. The baseline scenario is determined following the ambitious benchmark approach, as per paragraph 36(ii) of the RMPs, with the amount of useful energy provided per person per year standardized at the level of the mechanism methodology. For useful energy delivered for cooking, a standardized value of 0.001095 TJ for charcoal as primary fuel and 0.001277 TJ for fuelwood as primary fuel per person per year is assumed. These values are supported by academic literature that cites a reasonable range of 2–4 MJ delivered per person per day (without distinguishing between rural, peri-urban, and urban conditions) and is within the threshold value for useful energy delivered for cooking and heating up to 2.1 GJ per person per year (equivalent to 5.75 MJ per person per day) included in version 01.0 of the “Standard: Addressing suppressed demand in mechanism methodologies” (A6.4-STAN-METH-006).[7]

29. The ambitious benchmark will be defined at the activity level following a step-wise approach included in the mechanism methodology that uses pre-activity survey data as an empirical data input to define the distribution of existing cooking technologies and define the activity-specific benchmark based on the performance of the best-performing cohort (top 20th percentile) of the observed cookstove types by fuel. This method is supported by a cross-check with ambitious benchmark backstop values that rely on conservative assumptions about the penetration of improved cookstoves and are expected to ensure environmental integrity.

3.5. Calculation of unadjusted baseline emissions

30. Baseline emissions prior to downward adjustment are calculated by quantifying the consumption of baseline fuels (fuelwood, charcoal and other secondary fuels, if applicable) required to deliver the standardized level of useful cooking energy in TJ per person per year. Baseline fuel consumption is determined using the ambitious benchmark approach, ensuring that the baseline remains conservative relative to BAU conditions, and is scaled based on average household size and observed participation of households in the Article 6.4 activity through the use of a project cookstove.

31. The extent of usage is determined through the proportion of households using the activity cookstoves and the number of potential usage days during the monitoring period. To establish the usage percentage, as a bridging measure, usage rates may be derived from surveys. If usage is based exclusively on monitoring via surveys, then conservative caps of 90 per cent or 58 per cent are applied, depending on the provision of customer support measures. Alternatively, usage may be measured using Stove Use Monitors (SUMs) on all stoves or a sample of users. When measurement based on SUMs is used, caps do not apply.

32. The MEP recommends that from 2028 onwards, the use of SUMs be mandated for measuring usage rates, since this direct measurement provides a much greater level of accuracy and thus confidence in usage, thereby responding to well-founded criticisms of earlier efficient cooking methodologies. The MEP has included this recommended cut-off date as an option in the mechanism methodology. The bridging period for switching to SUM-determined usage rates will ensure that requirements do not apply retroactively to transitioning projects and that project developers have enough time to adapt their practices.

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[7] Gill-Wiehl, A., Kammen, D.M. & Haya, B.K. Pervasive over-crediting from cookstove offset methodologies. Nat Sustain 7, 191–202 (2024). https://doi.org/10.1038/s41893-023-01259-6.

3.6. Application of the downward adjustment

3.6.1. Calendar year of the start of the first crediting period

33. For baselines determined using the ambitious benchmark approach, no downward adjustment is applied in the calendar year of the start of the first crediting period. Accordingly, under this methodology, no downward adjustment is applied in the first calendar year.

3.6.2. Subsequent years

34. The MEP recommends that the Supervisory Body exempt this mechanism methodology from downward adjustment in subsequent years, in line with paragraphs 65 and 66 of the Baseline Standard. The rationale for this exemption includes primarily that the mechanism methodology applies to emission reduction activities that are implemented exclusively in low-income and impoverished households and, in addition to climate benefits, also result in health and gender-related improvements for the participating households (see further explanation in section 4 of Appendix 7.

35. In the event that the exemption is not approved, the mechanism methodology includes an option requiring the application of downward adjustments on an annual basis throughout the crediting period, using a downward adjustment factor beginning with one per cent per cent in year two and that increases by one per cent per year (see section 7.5.1).

3.7. Identification of conservative BAU baseline and calculation of BAU emissions

36. The mechanism methodology defines a BAU scenario as the continuation of historical cooking practices in rural, low-income contexts where access to clean cooking remains limited and no significant trends toward improved technologies are observed. In these settings, households are expected to continue using traditional fuelwood or charcoal stoves, including replacing end-of-life devices with technologies of similar type and performance, in the absence of targeted interventions, regulatory requirements, or subsidies. The BAU baseline is standardized at the methodology level in relation to the delivery of useful energy demand for cooking. In establishing the BAU, the mechanism methodology includes the requirement to incorporate relevant policies, legal requirements, and sector-specific targets expected to be in force during the crediting period in the benchmark for the conservative BAU baseline, in case it is not already adequately addressed through the BAU benchmark and requirements included in the regulatory analysis.

37. The conservative BAU baseline is derived following an approach consistent with paragraph 77(b) of version 01.0 of the Baseline Standard whereby a conservative BAU baseline is determined through an alternative method that ensures the crediting baseline remains below BAU. The mechanism methodology isolates the primary parameter that varies between baseline and activity scenarios - thermal efficiency of the cookstove - and applies a conservative value based on a review of literature directly relevant to this parameter, rather than applying uncertainty across all baseline components as described in the paragraph 77(a) of the Baseline Standard. Key parameters related to fuels, such as calorific value, emission factors, and fraction of non-renewable biomass, are assumed to remain unchanged between baseline and activity scenarios, with the primary differentiating factor being the thermal efficiency of the cookstove. Conservative BAU thermal efficiencies are determined using observed measurements of efficiencies of

traditional stoves from the literature, and applying the highest central value identified, corresponding to 13 per cent for fuelwood cookstoves and 25 per cent for charcoal cookstoves.

3.8. Comparison of the downward adjusted baseline and the conservative BAU baseline

38. Activity participants are required to compare the downward-adjusted baseline with the conservative BAU baseline. The downward-adjusted baseline shall always be lower than the conservative BAU baseline as follows:

    (a) Where this condition is not met ex-ante, the downward-adjusted baseline shall be further adjusted; and

    (b) Where this condition is not met ex-post (i.e., in the monitoring reports), the conservative BAU baseline is applied.

39. This comparison ensures that credited Article 6.4 emission reductions (A6.4 ERs) are not overstated. If the SBM approves an exemption to downward adjustment for this methodology, then the comparison would be carried out between the baseline and the conservative BAU directly.

40. In either case, considering the conditions of the ambitious benchmark baseline and of the BAU and conservative BAU defined at the level of the mechanism methodology, in many potential cases, it can be concluded that the comparison would show that the baseline is indeed lower than the conservative BAU. In these cases, the A6.4 activity would not be required to undertake the full calculations, as a simplification that does not affect environmental integrity. On the other hand, if relevant policies, legal requirements, and sector-specific targets expected to be in force during the crediting period are incorporated in the BAU, thereby resulting in a lower value than the standardized value provided in the mechanism methodology, then the activity participant shall calculate the full conservative BAU and carry out the comparison during the design document development or during the monitoring period. The mechanism methodology provides the procedures for this.

3.9. Activity emissions

3.9.1. Fuel consumption in the activity scenario

41. The fuel consumption of project cookstoves is measured using a sampling approach at a subset of households. To determine fuel consumption during the activity, activity participants shall conduct an activity kitchen performance test (KPT) campaign in a sample of activity households.

42. Energy consumption in the activity scenario is determined by converting measured fuel quantities into energy units. While fuel use is measured in mass units through KPTs, activity emissions are calculated on an energy basis. Net calorific values are applied to convert fuel consumption from mass to energy.

43. Activity fuel consumption converted to energy units are scaled based on household size and qualification for inclusion in the calculation based on whether the household qualifies as a project cookstove user household. The methodology also includes a consistency check to ensure that the useful energy delivered in the activity scenario meets the minimum required cooking energy level; where this is not achieved, baseline emissions are pro-rated.

3.9.2. Hawthorne effect adjustment

44. To adjust for the potential Hawthorne effect, activities can either (i) upward adjust their activity emissions from what the activity KPT-based estimate would be by 25 per cent of the difference between baseline and activity emissions as a conservative default, or (ii) directly measure any Hawthorne effect using stove use monitors (SUMs), by comparing cookstove use during the KPT to the month before or after and adjusting activity emissions accordingly. The MEP recommends that, from 2028 onwards, this second method which relies on SUM be mandatory, thereby responding to criticisms of earlier efficient cooking methodologies. The MEP has included this recommended cut-off date as an option in the mechanism methodology. The bridging period for switching to SUMs-determined Hawthorne effect estimates will ensure that requirements that cannot be implemented after-the-fact do not apply retroactively to CDM projects that requested transition to Article 6.4 mechanism and that project developers have enough time to adapt their practices.

3.9.3. Defining user households

45. The methodology draws from PMM004.[8] User households are activity households with a functioning project cookstove that is in use at least five times per week (or a higher threshold specified by the Article 6.4 activity) during a given monitoring period, confirmed through both self-reporting (annual usage surveys) and visual inspection, or through SUMs cross-checked by surveys. The emission reductions calculations are structured such that emission reductions are not quantified from activity households that do not meet these criteria.

46. The usage parameter is capped under the first option (annual usage surveys and visual inspection) based on whether the activity provides certain customer support actions described in the methodology. For Article 6.4 activities to be eligible to claim up to 90 per cent usage, the activity participants must carry out the customer support actions described in the methodology and provide evidence of how each condition has been met on the Activity Information Cover Sheet during the crediting period of the activity. Activity participants who do not undertake all these customer support actions may claim up to 58 per cent of maximum usage. This lower threshold is based on data about clean cooking technology adoption from the literature. When usage is estimated using monitoring by SUMs, caps do not apply. Rate of project cookstove use cannot be used as a substitute for direct fuel consumption measurements in the Article 6.4 activity based on KPTs, which are required for calculating all activity emissions and emission reductions.

3.9.4. Fraction of non-renewable biomass (fNRB)

47. The mechanism methodology requires the use of fraction of non-renewable biomass (fNRB) values contained in the “Methodological tool: Fraction of non-renewable biomass” (A6.4-AMT-009) (hereinafter referred to as “fNRB tool” and provides requirements for how to select the $fNRB_y$ default at the multi-national, national, or sub-national level.

[8] A6.4-PNM004-Proposed new methodology: Comprehensive Lowered Emission Assessment and Reporting (CLEAR) Methodology for Cooking Energy Transitions.

3.9.5. Wood to charcoal conversion

48. Based on the latest scientific evidence, the methodology includes emission factors based on a 5:1 conversion factor, where the conditions can be demonstrated that this factor is conservative, i.e., that the charcoal used is artisanal charcoal.

3.10. Leakage

49. The mechanism methodology includes provisions to assess and account for potential sources of leakage associated with the Article 6.4 activity. Leakage is evaluated across multiple dimensions, including continued use of baseline technologies, transfer or reuse of baseline equipment, resource diversion, and upstream emissions from the production and distribution of improved cookstoves. The mechanism methodology recognizes that continued or simultaneous use of baseline stoves by activity households does not constitute leakage emissions but is quantified directly as activity emissions. On the other hand, baseline equipment transfer is not considered a source of leakage due to its limited residual value and its potential to displace more emission-intensive alternatives. The activity reduces consumption of the same biomass resources used in the baseline, thereby avoiding resource diversion. Empirical evidence suggests that reductions in biomass use do not lead to increased consumption by neighbouring households, therefore leakage from this source also is ruled out. Leakage emissions from cookstove production and transport are estimated and included. Broader market effects, such as increased renewability of biomass due to reduced demand and enhanced regrowth of biomass, may contribute to positive leakage. These are acknowledged in the explanation provided in Appendix 7 but not addressed in the calculations, and this is conservative.

3.11. Non-permanence provisions

50. A subset of the A6.4 ERs affects GHG reservoirs that are subject to reversal risks. Specifically, reversal risks apply to the GHG reservoirs that are identified in table 2 of the mechanism methodology and the provisions in section 10.2 (including equation 36) of the mechanism methodology.

51. The mechanism methodology applies an alternative approach to address non-permanence risks in accordance with the paragraph 13 of version 01.0 of the "Standard: Addressing non-permanence and reversals in mechanism methodologies" (A6.4-STAN-METH-007).[9] This approach is justified based on the demonstration that activity participants do not have control over the relevant GHG reservoirs, these reservoirs are geographically distinct from the locations of the cookstove deployment by the mitigation activity, and observed changes in the reservoirs cannot be directly attributed to the activity. On this basis, the mechanism methodology exempts activity participants from requirements related to monitoring, reporting, and managing reversals, including during the crediting period and any post-crediting monitoring period.

52. Potential reversal risks are conservatively quantified based on a 100-year risk assessment using the applicable draft "Methodological tool: Reversal risk assessment" (A6.4-MEP014-A07)[10] and then addressed through contributions to the reversal risk buffer pool account, where these A6.4 ER are immediately cancelled. This ensures that any potential future

[9] See https://unfccc.int/sites/default/files/resource/A6.4-STAN-METH-007.pdf.

[10] See https://unfccc.int/sites/default/files/resource/A6.4-MEP014-A07.pdf

reversals are fully addressed. Furthermore, the approach avoids moral hazard, as activity participants neither control the relevant carbon reservoirs nor have any incentive to increase reversal risks, with their interests aligned toward reducing biomass consumption and associated emissions. These provisions ensure a practical and risk-based approach to non-permanence.

3.12. Emission reductions

53. The overarching equation for calculation of net GHG emission reductions is provided in section 11 of the methodology. The section also reiterates an equation from the Reversals Standard to allow the user of the methodology to calculate, for their informational purposes and transparency, the eligible A6.4ERs after consideration of buffer deductions and deductions associated with the share of proceeds (SOP)[11] and overall mitigation in global emissions (OMGE) in line with “Procedure: Article 6.4 mechanism registry” (A6.4-PROC-REGS-001).[12]

3.13. Uncertainty

54. The Baseline Standard states that formulas for error propagation are one approach that may be applied to quantify uncertainty of the baseline emissions. Under this mechanism methodology, which focuses on energy efficiency, some parameters that are assumed to remain the same in both baseline and activity scenarios have large uncertainty ranges that do not follow a normal distribution. For example, as per the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (hereinafter referred to as “IPCC Guidelines (2006)”) the methane emission factor for charcoal combustion has a default emission factor of 200 kg/TJ with a lower bound value of 70 and higher bound value of 600.[13] Initial calculations found that general methods for uncertainty propagation produced very high outcomes, and standard calculations of 95 per cent confidence intervals did not appropriately express the uncertainty. Hence, the methodology warranted a different approach for analysing uncertainty aligned with the Baseline Standard, and the MEP selected the Monte Carlo simulation among the approaches provided by the relevant IPCC guidelines.

55. The MEP and the secretariat therefore conducted uncertainty analysis at the level of the mechanism methodology using a Monte Carlo simulation. The Baseline Standard requires that emission reductions be "very unlikely to be overestimated, taking into account the overall uncertainty." In IPCC AR5 calibrated uncertainty language, "very unlikely" means below 10 per cent probability. In analysing the results of the Monte Carlo simulation of emission reduction results, the 10^{th} percentile of the results (P10) implements "very unlikely to be overestimated" was chosen, since there is a 90% probability that the true emission reductions exceed the P10 value. The P10 of the results of the Monte Carlo simulation were found to be in the range of, or higher than, the quantification resulting from the methods and parameter values included in this mechanism methodology. Therefore, the MEP concluded that the emissions reductions calculated using this mechanism

[11] Share of proceeds for adaptation account, which receives A6.4ERs in accordance with paragraph 58 of the RMPs (SoP account).

[12] See https://unfccc.int/sites/default/files/resource/A6.4-PROC-REGS-001.pdf.

[13] See: https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf.

methodology are very unlikely to be overestimated and that it is not required to undertake uncertainty analysis at the level of individual Article 6.4 activities. This approach provides simplification for activity participants applying this mechanism methodology.

56. The P10 values are generally about 30 per cent to 50 per cent of the mean values (P50); for example, for a hypothetical stove where the P50 value is 0.950 tCO_2eq reductions per stove per year, the P10 value is 0.446 tCO_2eq reductions and this value ensures that emission reductions are very unlikely to be overestimated.

3.14. Monitoring, data, and parameters

57. The mechanism methodology establishes monitoring requirements for critical parameters of the Article 6.4 activity. Section 14 describes the schedule of monitoring for elements such as usage surveys, KPTs, and SUMs, while also prescribing additional contextual requirements such as consideration of seasonality.

58. Section 15 of the mechanism methodology establishes data and parameters that are fixed and are not required to be monitored by the Article 6.4 activity during the crediting period. These include key data and parameters such as technical lifetime of participants project cookstove, thermal efficiency of the project cookstove, fNRB, emission factors, and baseline energy consumption benchmarks.

59. Section 16 of the mechanism methodology establishes data and parameters that are monitored, including procedures on monitoring and measurement of the parameters. These parameters include but are not limited to, days in which project cookstoves are present in households, average household size, usage status based on cooking events per week per household, quantity of new project cookstoves added each year, and activity energy use measured using sampling campaigns of KPTs.

60. Appendix 4 and Appendix 5 of the draft mechanism methodology are adapted from PMM004 and have been revised to streamline their content by retaining only activity-specific requirements relating to surveys and sampling, while removing or consolidating generic provisions that are now addressed in the main body of the draft “Methodological tool: Sampling and surveys for Article 6.4 activities and programmes of activities” (A6.4-MEP014-A05)[14] (hereinafter referred to as “sampling and surveys tool”), which is under development. Requirements and guidance related to survey design, sampling approaches, and data quality assurance have been harmonized and aligned with the overarching statistical framework established in the sampling and surveys tool.

3.15. Avoidance of double counting

61. The mechanism methodology includes provisions to ensure the avoidance of double counting of emission reductions from the Article 6.4 activity. Activity participants are required to demonstrate, in each monitoring report, that emission reductions from the Article 6.4 activity are not claimed in other environmental markets or accounting frameworks, except for non-GHG outcomes such as air quality or social benefits. In addition, participants are required to demonstrate that the Article 6.4 activity and its baseline scenario do not overlap with mandatory domestic mitigation schemes, or, where such overlap exists, that the emission reductions are not used to meet obligations under those schemes or are excluded from crediting. Participation in frameworks that formally

[14] See https://unfccc.int/sites/default/files/resource/A6.4-MEP014-A05.pdf

integrate the Article 6.4 mechanism does not constitute double counting. Furthermore, explicit consent is required to be obtained from participating households confirming that emission reductions are solely attributed to the activity and are not claimed under any other carbon crediting programme.

3.16. Alignment with NDCs, LT-LEDS, and long-term goals of the Paris Agreement

62. Activity participants shall provide the designated operational entity (DOE) with a confirmation from the DNA of the host Party that the DNA has undertaken an assessment of the activity's consistency with Decision 3/CMA.3 paragraph 40(c) and paragraph 27(a), as part of the host Party's approval.

4. Consideration of public comments

63. A call for input on this methodology was open from 24 April to 15 May 2026. Twenty submissions containing 285 comments were received in response to this call for public input. This section summarizes how the comments from this call for public input were addressed.

4.1. Conservativeness

64. Several comments expressed the view that the mechanism methodology provides an overall high level of conservativeness and is expected to lead to a strong reduction in A 6,4 ERs issued to activity participants compared to the levels issued under the CDM or under similar methodologies under the voluntary carbon mechanisms. Several stakeholders expressed that the high level of conservativeness is due to a combination of a conservative ambitious benchmark as baseline, multiple conservative assumptions and default values (including for the fraction of non-renewable biomass), conservative adjustments for uncertainty, downward adjustment in subsequent years, and contribution to the buffer pool on the basis of a reversal risk. Furthermore, stakeholders pointed that besides various elements of conservativeness, deduction for OMGE and SOP to the adaptation fund also reduce the amount of A6.4ERs to activity participants:

(a) Based on the stakeholder feedback and the results of the uncertainty analysis using Monte Carlo simulation undertaken by the MEP and the secretariat, the MEP addressed the concerns while maintaining alignment with the requirement of the Baseline Standard to ensure that it is "very unlikely" that emission reductions are overestimated;

(b) The concerns were addressed mainly by changing the methods for determining the conservative BAU, adjusting the upstream charcoal emission factors, and recommending exempting this mechanism methodology from downward adjustment of the baseline.

65. Several comments expressed the view that the wood to charcoal conversion factor of 4:1, which is used to calculate upstream emissions associated with charcoal production, is overly conservative and does not reflect the low conversion efficiency found in artisanal charcoal production. The MEP agreed to switch to a conversion factor of 5:1 as the basis for the upstream emission factors, which is still conservative but closer to observed central values.

66. Several comments requested to exempt activities from the downward adjustment factor in subsequent years as part of this methodology, noting that such an exemption is possible as per section 7.2 of version 01.0 of the Baseline Standard. Furthermore, the comments highlighted how refraining from applying a downward adjustment would more closely reflect the contexts of rural poverty where the rate of autonomous adoption of improved stoves is negligible. The MEP included an option in the mechanism methodology, for consideration by the Supervisory Body, to exempt the methodology from the application of annual downward adjustments. With regard to the rationale for such an exemption, the MEP noted that the mechanism methodology applies to emission reduction activities that are implemented exclusively in low-income and impoverished households and, in addition to climate benefits, also result in health and gender-related improvements for the participating households.

67. Several comments voiced that the default value for useful energy of 0.001095 TJ per person per year (3 MJ/person-day) is overly conservative and is not representative of realities observed on the ground. The MEP considered the comment and agreed to revise this value when fuelwood is the primary fuel to from 0.001095 to 0.001277 TJ per person per year.

4.2. Definitions

68. Several comments proposed further elaborating the definition of “Artisanal cookstoves”. The MEP revised the definition accordingly (see paragraph 7(a) of the draft methodology).

69. Several comments received pertained to the definition of “User household” which currently requires to use the activity cookstove at least once per week. Some comments expressed the concern that this threshold was too low and highlighted the risk of stove stacking. The MEP considered these comments and decided to increase the threshold to a minimum of 5 cooking events per week, while leaving the possibility for activity participants to set even higher thresholds (see paragraph 7(p) of the draft methodology).

4.3. Applicability

70. Several comments raised concerns on the fact that the proposed mechanism methodology provisions cannot accommodate biochar-making stoves. The MEP decided however to maintain its current approach, noting that the scope of this mechanism methodology is limited to energy efficiency improvements in contexts defined by rural poverty. The MEP further notes that biochar-making stoves could be enabled under the Article 6.4 mechanism, either by proposing revising an approved methodology, or by submitting a proposed new mechanism methodology.

71. Several comments questioned the use of the 4.5 per cent ceiling on the penetration rate of improved cookstoves in applicability conditions. The MEP agreed to maintain its current approach while clarifying that improved cookstoves implemented under other carbon crediting mechanisms are not included (see paragraph 13(j) of the draft methodology).

72. Several comments raised pertained to the applicability conditions for demonstrating a situation of low income or poverty levels. Some of these comments proposed providing more flexibility in demonstrating such situations. The MEP partly incorporated these proposals and amended the wording of the applicability conditions accordingly, incorporating in particular a simplified, adequate global cap when determining poverty (see paragraph 13(d) of the draft methodology).

73. Several comments raised concerns at the scope and other provisions of the proposed mechanism methodology, finding it too restrictive for the wide variety of potential improved cookstove activities. The MEP considered the input received and clarified that one or more other methodologies in preparation are intended to cover a broader scope of emission reductions from cookstove activities. In particular, it should be noted that the MEP is currently working towards further elaborating the proposed mechanism methodology PMM004 “Comprehensive Lowered Emission Assessment and Reporting (CLEAR) Methodology for Cooking Energy Transitions” for recommendation to the SBM.

74. Some comments expressed that the applicability requirement that a minimum of 75 per cent of cooking events are fired with fuelwood or artisanal charcoal is too vague or conservative. The comments requested in particular clarifying that these 75 per cent be interpreted as the minimum average at the project level. The MEP considered the comments and further clarified the applicability condition (see paragraph 13(a) of the draft methodology) of the mechanism methodology.

4.4. Additionality

75. Several comments raised concerns on the regulatory analysis as part of the additionality demonstration highlighting that there could be cases where support for improvement cookstove may exist but still be insufficient for their adoption. The MEP revised the wording of the regulatory analysis section accordingly to accommodate such cases (see paragraph 30(b)(ii) of the draft methodology).

4.5. Baseline

76. Several comments expressed views on the two option: methodology-based ambitious benchmark and ambitious benchmark derived by the activity participant. In particular, several comments voiced that the mechanism methodology based benchmark is overly simplistic compared to realities on the ground and too conservative, while the activity specific option was highlighted as impractical or complex with high expected transaction costs. Stakeholders raised concerns about both options for not reflecting more closely realities on the ground and argued for using approaches based on historical emissions. While noting these concerns, the MEP retained the approach of setting the baseline using an “ambitious benchmark” approach (see paragraph 52) following a procedure to derive an activity specific benchmark, while using a backstop benchmark set in the mechanism methodology to ensure environmental integrity and compliance with the uncertainty related requirements of the Baseline Standard. Finally, the MEP also clarified that data collection for the purpose of determining the pre-activity scenario is also used for setting the ambitious benchmark.

77. Several comments related to the monitoring of usage rate, and in particular the application of a cap on usage rate of either 90 per cent or 75 per cent when surveys are used, opposed to the use of SUMs which does not entail such a cap. Most inputs voiced that this adjustment adds another layer of conservative adjustment, while a minority of inputs also expressed that these caps may still be too high given the uncertainties involved when usage is determined based on surveys. In general, strong support was expressed for the use of SUMs. The MEP, after careful consideration of the issue, noted that SUM-based monitoring should be the preferred approach and recommended that it shall become mandatory. The MEP however noted that a grace period against such a requirement would be needed in order not to set a retroactive requirement to CDM projects which requested transition to Article 6.4 mechanism. The MEP thus recommends to mandate the use of

SUMs, from 1 January 2028 onwards (see paragraph 13(k)). The MEP further changed the lower cap on usage rate to 58 per cent in the absence of evidence for customer support actions, reflecting average rates of adoption of clean cooking technologies from the literature.

78. Several comments pointed to the fact that the assumed cookstove efficiency value used in the "conservative BAU" exceeds and thus always overruns the average efficiency from the ambitious benchmark (when uncertainty is taken into account, using the higher bound of uncertainty), highlighting that the value to be applied is overly conservative. The MEP considered these comments and agreed to revise the values applied in the conservative BAU to reflect expected conditions on the ground while still upholding conservativeness as reflected in Table 4).

79. Some comments requested more clarity on the cross-check between the pre-activity survey and reputable surveys or sources of literature. The inputs received highlighted in particular that in the absence of clear guidance, Designated Operational Entities would require the selection of the most conservative of either rather than the most adequate and reliable source of information. The MEP considered the comments and agreed to provide a corresponding procedure to better balance accuracy, relevance and conservativeness (see paragraph 35 of the draft methodology).

80. Some comments voiced that the "Assessment of the presence of cooking technologies equivalent to the activity cookstoves" should exclude technologies installed under another activity registered under another carbon crediting scheme. The MEP considered the comment and agreed to proceed with this exclusion (see paragraph 46(a) of the draft methodology).

4.6. Activity scenario

81. Several comments expressed concerns on the treatment of suppressed demand in the proposed mechanism methodology, arguing that the current approach would penalize households in such situations, with some comments pointing precisely to issues with paragraphs 91 and 92 in the draft methodology that was published for public input.[15] Having considered the issue, the MEP considered that those paragraphs were unrelated to suppressed demand, but rather ensure the attribution of emission reductions to the Article 6.4 activity and retained the paragraphs.

4.7. Appendices:

82. Several comments suggested modifying and further elaborating the procedure and text for the waiver certificate in Appendix 2. The MEP considered these comments and amended Appendix 2 accordingly.

4.8. Non-permanence provisions:

83. Several comments raised the issue of contributions to the reversal risk buffer pool account for reversal risks and provided their justification for exempting improved cookstove activities from a contribution to the buffer pool. The MEP, after having considered carefully the rationales provided, reconfirmed that activities under this methodology ultimately reduce the depletion of non-renewable biomass which stems from a carbon reservoir at

[15] See: https://unfccc.int/sites/default/files/resource/A6.4-MEP013-A02.pdf

risk of reversal. The MEP further noted that, pursuant to paragraph 6(a) of version 01.0 of the Reversals Standard, contributions to the reversal risk buffer pool account are required for this component of A6.4ER issuance.

4.9. Others:

84. Several comments highlighted that some of equations would need to be amended to avoid a double summation and to correct some editorial inconsistencies. The MEP addressed these issues (see Equations 1, 8 and 17).

85. Several comments pertained to values used for the fraction of non-renewable biomass (fNRB). While noting that these comments are out of scope and were addressed during the development of the fNRB tool, the MEP notes the following:

    (a) In particular, several comments wondered why the values from the MoFuSS study published by the CDM in June 2024 were not used directly in the "Tool: Fraction of non-renewable biomass"[16] (herein after referred to as "fNRB tool"). The MEP would like to clarify that fNRB values were in some case further refined based on discussions held between the CDM Methodologies Panel and the authors of the study, including in response to further mandates from the CDM Executive Board;

    (b) Several comments also expressed concerns about the conservativeness of these values. The MEP would like to point out that the values adopted in this tool represent the best available science for estimating fNRB values;

    (c) Finally, some comments suggested to adopt a dynamic fNRB approach (also known as "marginal approach") considering that in the activity, the fNRB ratio would de-facto become lower. The MEP notes that while this option was discussed when elaborating the fNRB tool, the mechanism methodology will rely on the approved version of this tool as approved by the SBM at its 21st meeting and further notes that the Supervisory Body provided to the MEP a mandate to conduct further analysis of alternate versions of MoFuSS.

86. Several comments expressed concern at the fact that the proposed mechanism methodology validity would expire after 31 December 2030. The MEP agreed to clarify that the expectation is that this mechanism methodology would then be replaced with an updated version.

87. One comment suggested setting the upstream leakage at zero for artisanal improved cookstoves, noting the emissions from the production of such cookstoves is negligible compared to industrially produced improved cookstoves. The comment was partially addressed by incorporating a higher estimate for upstream leakage from industrially produced cookstoves and a lower estimate for artisanal, locally produced stoves, while still complying with the requirements of the Leakage Standard, in section 9.

88. Several comments raised the issue that the required ISO standard for testing the stove efficiency may soon be replaced by a newer version. But the comments also raised the fact that testing according to this standard may not be an option in many developing countries. The MEP considered the comment and revised its approach to allow the use of

[16] See https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/a64-amt-009

any subsequent revision of the ISO 19867-1:2018 or as an alternative use equivalent national standards in circumstances where testing facilities are not available in the host country (see paragraph 13(i) of the draft methodology).

5. Impacts

89. The approval of this mechanism methodology will allow the development of Article 6.4 activities that aim to reduce emissions from reducing biomass combustion through improved cookstoves in rural areas.

6. Subsequent work and timelines

90. If the Supervisory Body approves the draft mechanism methodology, the MEP will reflect the approach of a relative downward adjustment applied in this mechanism methodology in a future revision of the Baseline Standard once the standard is revised.

91. It may be noted that the MEP will continue working on the bottom-up submission PMM004 and top-down revision of CDM Methodology: "AMS-I.E.: Switch from non-renewable biomass for thermal applications by the user" to develop a mechanism methodology with broader applicability conditions to cover a wider variety of clean and efficient cooking activities than the current proposed methodology. [17]

7. Recommendations to the Supervisory Body

92. The MEP agreed to recommend that the Supervisory Body provides an exemption for the application of the downward adjustment in second and subsequent calendar years in the proposed mechanism methodology, pursuant to paragraphs 65 and 66 of version 1.0 of the Baseline Standard.

93. The MEP further agreed to recommend that the Supervisory Body adopt the draft mechanism methodology, contingent on the Supervisory Body approving the following methodological standards and methodological tools:

    (a) The "Methodological tool: Sampling and surveys" that will undergo a call for public input before being finalized and recommended for the Supervisory Body's consideration;

    (b) The "Methodological tool: Reversal risk assessment" that will undergo a call for public input before being finalized and recommended for the Supervisory Body's consideration; and

    (c) The relevant revisions to approved standards and methodological tools required for the application of this mechanism methodology, including in relation to PoAs, noting that relevant proposals to effect these changes are addressed in a draft concept note (A6.4-MEP014-A02)[18] that will undergo a call for public input before being finalized and recommended for the Supervisory Body's consideration.

[17] Comprehensive Lowered Emission Assessment and Reporting (CLEAR) Methodology for Cooking Energy Transitions hereinafter referred to as A6.4-PMM004.

[18] See https://unfccc.int/sites/default/files/resource/A6.4-MEP014-A02.pdf

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1. Introduction

1.1. Scope

1. This version mechanism methodology is applicable for Article 6.4 projects and Article 6.4 programme of activities (PoAs), jointly referred to as “Article 6.4 activities”, that comprise efficiency improvements in thermal applications in household cooking in rural areas where the population is demonstrated to experience low income or poverty levels. Examples of applicable technologies and measures include the introduction of high efficiency fuelwood-fired or artisanal charcoal-fired cookstoves to replace existing devices.

2. Article 6.4 Emission Reductions (A6.4ERs) issued based on this mechanism methodology represent emission reductions. A subset of these emission reductions is subject to reversal risks.[1]

1.2. Applicability of sectoral scopes

3. Designated operational entities validating and verifying Article 6.4 activities that use this mechanism methodology shall apply sectoral scope 3.

1.3. Entry into force and validity

4. This mechanism methodology enters into force on the DD Month YYYY.

5. This mechanism methodology remains valid until DD Month YYYY, unless an earlier date applies if the mechanism methodology is revised or withdrawn in accordance with the “Procedure: Development, revision and clarification of methodologies and methodological tools” (A6.4-PROC-METH-001).[2]

2. Definitions

2.1. General terms

6. The following general terms are applied in this mechanism methodology:

   (a) "Shall" is used to indicate requirements that must be followed;

   (b) "Should" is used to indicate that, among several options, one course of action is recommended as particularly suitable; and

   (c) "May" is used to indicate what is permitted.

2.2. Methodological terms and definitions

7. The following general terms and definitions apply in this mechanism methodology:

[1] The mechanism methodology proposes alternative approaches to certain elements of the “Standard: Requirements for activities involving removals under the Article 6.4 mechanism” (A6.4-STAN-METH-002) (hereinafter the “Removals Standard”) since the affected greenhouse gas (GHG) reservoir complies with all three conditions of paragraph 13 of version 01.0 of the “Standard: Addressing non-permanence in mechanism methodologies” (A6.4-STAN-METH-007) (hereinafter the “Reversals Standard”).

[2] See https://unfccc.int/sites/default/files/resource/A6.4-PROC-METH-001.pdf.

(a) **Artisanal cookstoves:** cookstoves produced by small-scale manufacturing processes with no insulation or thermal envelope that can result in large variations in dimensions and performance across units. They are generally made by hand by skilled workers, rather than mass-produced in factories, and use solid biomass as the primary fuel;

(b) **Artisanal charcoal:** a biomass fuel that is a black substance made up mostly of carbon and has higher energy density than wood. Artisanal charcoal is produced using traditional, small-scale methods, which typically involve stacking wood and covering it with earth. A fraction of the wood is burned, which initiates pyrolysis, a thermo-chemical process that drives off moisture and volatile compounds at high temperatures in the absence of oxygen, leaving behind charcoal. This technique has been used since the Bronze Age and contrasts with more modern techniques;

(c) **Best practice**: evidence-based approaches recommended throughout this mechanism methodology based on expert judgment and literature sources;

(d) **Cooking event:** occurrence in which energy is delivered from a cookstove to perform a discrete task or set of tasks, such as cooking a meal, preparing beverages or heating water;

(e) **Displacement:** discontinuation of use of baseline cooking technologies and fuels due to use of the project cookstove;

(f) **Fraction of Non-Renewable Biomass (fNRB):** the proportion of harvested biomass that exceeds the natural rate of regeneration of the landscape during a given period;

(g) **Harvested biomass**: above-ground woody biomass collected or cut from living trees for use as fuelwood or for conversion to charcoal for use as fuel;

(h) **Hawthorne effect**: impact on user behaviour (such as altered use of cooking technologies or fuels) resulting from awareness of being observed during monitoring or measurement activities, leading to a deviation from typical usage patterns;

(i) **Household:** individual residential unit and all the individuals living together and sharing cooking facilities and energy resources within that dwelling as their usual place of residence;

(j) **Kitchen Performance Test (KPT):** field-based procedure to quantify fuel consumption under typical household and cookstove usage conditions that involves daily measurements of the amount of fuel used across several days in the user household's kitchen;

(k) **Project cookstoves:** all cookstoves introduced by the Article 6.4 activity and used by user households to replace or reduce the use of existing cookstoves;

(l) **Stove stacking**: use of multiple cooking technologies and/or fuels within a user household;

(m) **Stove Use Monitor (SUM):** device that quantifies cookstove usage through direct measurements of physical or chemical parameters (e.g., temperature) of cookstoves that relate to the number of cooking events. SUMs do not measure fuel or energy consumption;[3]

[3] Information, requirements and best-practice guidance related to SUMs are available in Appendix 6.

(n) **Third-party entity:** entity that has no affiliation with the activity participants and no financial stake in the Article 6.4 activity that applies this mechanism methodology;

(o) **Useful energy:** Useful energy is the thermal energy effectively delivered by a cookstove to perform cooking events, excluding all conversion and transfer losses;

(p) **User household:** Article 6.4 activity household with a functioning project cookstove that is used, on average, for at least five cooking events per week during a given monitoring period. The Article 6.4 activity may choose a higher threshold to define a user household, and the threshold for user household shall be specified in the monitoring plan and applied consistently to the entire crediting period;

(q) **Usage:** frequency of cooking events with the project cookstove; and

(r) **Wood-to-charcoal conversion factor:** the amount of wood needed to produce a certain quantity of charcoal, expressed as a ratio of the mass of air-dry wood input per mass of charcoal output.

8. Furthermore, the terms in the “Glossary: Article 6.4 mechanism terms” (A6.4-GLOS-GOV-001) and the definitions and terms in the methodological tools referred to in section 3 shall apply.

3. Normative and informative references

9. This mechanism methodology is based on elements from version 14.0 of the Clean Development Mechanism (CDM) Methodology “AMS-II.G.: Energy efficiency measures in thermal applications of non-renewable biomass”[4] and bottom up submission, ”A6.4- Proposed new methodology: Comprehensive Lowered Emission Assessment and Reporting (CLEAR) Methodology for Cooking Energy Transitions” (A6.4-PNM004).[5]

10. The following normative documents are indispensable for the application of this mechanism methodology:

(a) “Methodological tool: Sampling and surveys” (A6.4-AMT-XXX) (hereinafter referred to as “sampling and surveys tool”);[6]

(b) “Methodological tool: Reversal risk assessment” (A6.4-AMT-XXX) (hereinafter referred to as “reversal risk assessment tool”);[7]

(c) “Methodological tool: Fraction of non-renewable biomass” (A6.4-AMT-009) (hereinafter referred to as “fNRB tool”);[8]

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[4] See https://cdm.unfccc.int/methodologies/DB/5V2D9RXNOWLQII5N26KJK0J3A0JJV8.

[5] See https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/A6.4-PMM004.

[6] This draft methodological tool is still under development and is yet to be approved by the Supervisory Body. The draft methodology will be revised accordingly if changes to the draft version of the methodological tools are made by the time of their adoption.

[7] This draft methodological tool is still under development and is yet to be approved by the Supervisory Body. The draft methodology will be revised accordingly if changes to the draft version of the methodological tool are made by the time of their adoption.

[8] See https://unfccc.int/sites/default/files/resource/A6.4-AMT-009-v01.0.pdf.

(d) "Methodological tool: Investment Analysis" (A6.4-AMT-002) (hereinafter referred to as "investment analysis tool");[9]

(e) Intergovernmental Panel on Climate Change (2019). 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 1: General Guidance and Reporting. IPCC, Geneva, Switzerland;[10]

(f) Intergovernmental Panel on Climate Change (2006). 2006 IPCC Guidelines for National Greenhouse Gas Inventories;[11]

(g) UNDP (United Nations Development Programme). 2025. 2025 Global Multidimensional Poverty Index (MPI): Overlapping Hardships: Poverty and Climate Hazards. New York.[12]

4. Applicability

11. The mechanism methodology is applicable to Article 6.4 activities that:

(a) Distribute activity cookstoves that reduce greenhouse gas emissions through increased thermal efficiency relative to the baseline scenario;

(b) Are implemented in households[13]; and

(c) Are implemented in rural areas, according to the relevant national or sub-national government classification.[14]

12. The mechanism methodology is not applicable to activities that involve fuel switch between the pre-activity and activity scenario. [15]

13. Furthermore, this mechanism methodology is only applicable if all the following conditions apply:

(a) In the pre-activity scenario, the energy source for cooking in the target population is primarily fuelwood or artisanal charcoal (i.e., on average more than 75 per cent of cooking events are fired with fuelwood or artisanal charcoal), as determined via the pre-activity surveys;

[9] See: https://unfccc.int/sites/default/files/resource/A6.4-AMT-002-v01.0.pdf.

[10] See https://www.ipcc.ch/report/2019-refinement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/.

[11] See https://www.ipcc-nggip.iges.or.jp/public/2006gl/.

[12] https://hdr.undp.org/content/2025-global-multidimensional-poverty-index-mpi#/indicies/MPI.

[13] For activities implemented in other scopes than just households (e.g. in an institutional setting), stakeholders may submit a request for revision to this methodology or propose a new mechanism methodology.

[14] For example, where the government provides criteria for classifying rural areas, the Article 6.4 activity shall be implemented inside these areas; whereas, where the government provides criteria for classifying urban and peri-urban areas, the Article 6.4 activity shall be implemented outside these areas.

[15] This condition is introduced as the emission reductions calculations are based only due to gain in thermal efficiency of cookstoves between the pre-activity and activity scenario. Fuel switch activities will be included in a separate mechanism methodology.

(b) In the user households, the primary energy source for cooking (i.e., fuelwood or artisanal charcoal) shall remain unchanged between the pre-activity and activity scenarios, thereby excluding fuel switching. The comparison between the pre-activity and activity scenarios shall ensure consistency in the proportion of cooking events fired with the primary fuel, such that any reduction in use does not exceed 20 per cent below the pre-activity level during activity implementation[16]. This variation shall be interpreted solely as reflecting normal variability in household energy use and not as representing changes in primary energy source or the introduction of other fuels. This determination shall be made for the first monitoring report and be based on a comparison between the results of the first usage survey and the pre-activity survey;

(c) Where artisanal charcoal is used in the pre-activity scenario, it shall be demonstrated that the main charcoal production methods in the geographical area of the activity boundary related to the fuel "charcoal"[17] are consistent with the definition of artisanal charcoal, in other words that at least 90 per cent per cent of charcoal production in that geographical area is produced using traditional, small-scale methods, which typically involve stacking wood and covering it with earth, based on literature sources. When the multi-national activity boundary related to this fuel is applied, this demonstration shall include the host Party where the activity is located as well as all neighbouring countries that are a significant source of imported charcoal;

(d) The Article 6.4 activity shall be implemented in locations where the population is demonstrated to experience low income or poverty levels based on a recognized poverty index as follows:

(i) Where available, the poverty levels shall be demonstrated using national or sub-national poverty indices and their thresholds;

(ii) In the absence of the previous indices, the internationally recognized Multidimensional Poverty Index (MPI) shall be applied.[18] A population shall be considered to meet the poverty level criterion, if the average MPI score is equal to or greater than 0.2; or

(iii) Where neither of the indices above is available, the applicability shall be demonstrated based on the average income level. In such cases, the Article 6.4 activity shall demonstrate that the income level of the target population is at or below the income threshold for poverty level established by the national or sub-national government, based on literature sources.

(e) Irrespective of the location of the activity, indices and thresholds used, the income level shall not be above the latest poverty level threshold determined by the World Bank for lower middle-income countries (e.g. US $4.2/day per person PPP 2021);

(f) Activity participants demonstrate that the Article 6.4 activity has selected project cookstove technologies that meet the cooking needs of the target population, either

[16] For example, if fuelwood was used for 90 per cent of cooking events in the pre-activity situation, then in the activity implementation its proportional use for cooking events shall not fall below 72 per cent. Any relative increase in the proportion of the primary energy source for cooking is acceptable.

[17] See section 16 of the mechanism methodology.

[18] See https://ophi.org.uk/global-mpi/2025.

by citing robust research or conducting an investigation of cooking practices and attitudes during the activity design phase;

(g) Project cookstoves are linked to a specific household through a permanent unique identifier affixed to the cookstove. Each identifier shall correspond to one and only one cookstove and one and only one household. The identifier shall be implemented through one of the following equally acceptable means: (i) a tag or plate affixed or fired into the body of the cookstove in such a way that its removal would damage or destroy the stove; or (ii) a stove use monitor (SUM) with a recorded serial number permanently installed on the cookstove. Household-only identification cards detached from the cookstove shall not be accepted as the sole means of identification. Activity participants shall maintain an identifier management system that ensures the traceability of each cookstove and its linkage to the corresponding household;[19]

(h) The Article 6.4 activity identifies and either replaces or retrofits malfunctioning project cookstoves with a technology of comparable or better quality and thermal efficiency or does not claim emission reductions for households when such failures occur. Article 6.4 activities provide a documented plan for this process at the design phase;

(i) All project cookstove models shall be tested for thermal efficiency using the standard ISO 19867-1:2018 – Clean cookstoves and clean cooking solutions — Harmonized laboratory test protocols (or any subsequent revision thereof), or equivalent national standards where an accredited laboratory with this capacity is not available in the host country, according to which:

   (i) Wood-burning project cookstoves that use a griddle surface (e.g., plancha cookstoves for making tortillas) achieve a minimum efficiency of 20 per cent;

   (ii) All other wood-burning project cookstoves achieve a minimum efficiency 25 per cent; and

   (iii) Project cookstoves burning charcoal achieve a minimum efficiency of 30 per cent.

(j) Prior to the implementation of the Article 6.4 activity, the percentage of households in the target population with a functional cooking technology that is assessed to have the same or a higher efficiency as the project cookstoves is 4.5 per cent or less, as determined by following the methods in section 7.1.1; and

(k) From 01 January 2028 onwards, emission reductions shall be calculated using stove usage monitored as per section 7.4.1 (using SUMs), noting that a robust sample of stoves equipped with SUMs can be used for deriving this parameter. For any monitoring after that date, emission reductions can only be claimed for stoves for which the usage rate was determined using SUMs.[20]

[19] The purpose of the permanent unique identifier ensures linkage of a particular cookstove to the household (i.e. one cookstove is mapped to only one household and vice versa); that one cookstove is accounted only once, i.e., only associated with one carbon credit activity claiming GHG emission re-ductions; and traceability for repair and replacement of the project cookstove in the event of damage or malfunctioning or when the cookstove is at the end of its technical lifetime.

[20] Cookstoves not covered by SUMs monitoring after this date may claim zero emission reductions until monitoring based on SUMs is implemented.

14. This mechanism methodology is applicable to Article 6.4 activities implemented at the project level or as a programme of activities (PoA). The mechanism methodology is not applicable to activities implemented at other scales (e.g., policies, sectoral approaches, etc.).

15. This mechanism methodology is only applicable on a standalone basis and shall not be applied in combination with other mechanism methodologies, unless one or more of the other mechanism methodologies specify how the interaction with this mechanism methodology is taken into account.

16. The above provisions shall be demonstrated as follows:

(a) The provisions in paragraphs 11, 12, 13(a), (c), (d), (e), (f), (h), (i), 13(k) and 15 shall be demonstrated in the project design document (PDD) and be assessed at the initial validation, as well as in the case of a change in project cookstove design over the activity lifetime;

(b) The provisions in paragraph 13(b) above shall be demonstrated in the PDD and demonstrated in the first monitoring report and assessed at the first verification; and

(c) The provisions in paragraphs, 13 (g) and (h) shall be demonstrated in each monitoring report and be assessed at each verification, as well as at each (KPT) cycle in line with paragraph 126.

17. The applicability conditions included in the methodological tools referred to in paragraph 10 also apply.

5. Activity Boundary

18. The activity boundary includes two components:

(a) The physical, geographical sites where the project cookstoves operate; and

(b) The location(s) in which the fuels used by the households are produced or the location(s) from where they are collected in the baseline and activity scenarios.

19. The emission sources included in or excluded from the activity boundary are specified in Table 1 below. The greenhouse gas (GHG) reservoirs included in or excluded from the activity boundary are specified in Table 2 below.

Table 1. Emission sources included in or excluded from the activity boundary

	Source	Gas	Included?	Controlled / Related to / Affected by?	Justification / Explanation
BASELINE SCENARIO	Thermal energy generation by burning of fuel	CO_2	Included	Controlled	Major source of emissions
		CH_4			Can be significant for some fuels
		N_2O			Can be significant for some fuels
	Fuel production (charcoal)	CO_2	Included	Affected by	Major source of emissions for some fuels
		CH_4			

	Source	Gas	Included?	Controlled / Related to / Affected by?	Justification / Explanation
		N_2O			Can be significant for some fuels
	Fuel transport	CO_2	No	Related to	Excluded for simplification
		CH_4			
		N_2O			
ARTICLE 6.4 ACTIVITY SCENARIO	Thermal energy generation by burning of fuel	CO_2	Included	Controlled	Major source of emissions
		CH_4			Can be significant for some fuels
		N_2O			
	Fuel production (charcoal)	CO_2	Included	Affected by	Major source of emissions for some fuels
		CH_4			Can be significant for some fuels
		N_2O			Can be significant for some fuels
	Fuel transport	CO_2	No	Related to	Excluded for simplification
		CH_4			
		N_2O			

20. Baseline and activity emissions from fuel transport are excluded for simplicity since the Article 6.4 activity reduces fuel consumption, but does not change the fuel types utilized. This is conservative since the emissions from fuel transport in the activity scenario therefore will be lower than in the baseline scenario.

Table 2. GHG reservoirs included in or excluded from the activity boundary

	Reservoir	Included?	Controlled / Related to / Affected by?	Justification / Explanation
BASELINE SCENARIO	Above-ground woody biomass in landscape	Included	Affected by	Primary source of harvested biomass
ARTICLE 6.4 ACTIVITY SCENARIO	Above-ground woody biomass in landscape	Included	Affected by	Primary source of harvested biomass
	Biochar	No	Controlled	Potential removals related to any biochar that is produced from gasifier stoves is not quantified. This is conservative

21. The physical, geographical sites where the project cookstoves operate are different from the location(s) in which the fuels used by the user households are produced or from where

they are collected in the baseline and activity scenario.[21] Activity participants shall confirm this by complying with the requirements in paragraphs 22 to 24 below.

22. Activity participants shall include in the PDD the location of the implementation of the Article 6.4 activity in the form of Keyhole Markup Language (KML) files or similar formats as one or more polygon(s), by specifying the coordinates of the geographic boundary where project cookstoves are distributed and operated (paragraph (a)) using a known coordinate system or any other established method.

23. The geographic limits of the activity boundary related to fuels (paragraph (b) shall be defined as sub-national, national or multi-national for each fuel type as follows:

(a) For charcoal, the geographical limits of the activity boundary:

(i) Shall be multi-national if both of the following conditions are true:

a. The host Party imports at least 50 per cent of its charcoal from outside its national boundaries (including, where applicable, undocumented or illegal trade); and

b. The applicable multi-national parameter from the fNRB tool is lower than the national parameter for the host Party from the methodological tool.

(ii) Shall be sub-national if all of the following conditions are true:

a. The specific source of the charcoal and the harvested biomass used to make the charcoal is known;

b. The specific source is reported in a KML file or similar; and

c. The specific source of the harvested biomass used to make the charcoal is entirely within one subnational jurisdiction.

(iii) Shall be national in all other circumstances where a national parameter is available for the host Party from the fNRB tool; and

(iv) Shall be multi-national in all other circumstances.

(b) For fuelwood, the geographic limits of the activity boundary shall be:

(i) Subnational where a subnational parameter is available for the applicable subnational jurisdiction from the fNRB tool;

(ii) National in all other circumstances where a national parameter is available for the host Party from the fNRB tool; and

(iii) Multi-national in all other circumstances, i.e. where a national parameter is not available.

24. When the geographic limits of the activity boundary related to fuels are determined pursuant to paragraph 22(a)(ii) only, activity participants shall further include in the design document:

[21] For example, the location from which fuels are produced or collected is a subnational administrative boundary, while the Article 6.4 activity involves the operation of project cookstoves in any number of communities or households, but not the entire subnational administrative boundary as a whole.

(a) The exact (if known) or approximate location(s) from which activity fuels are produced or collected in the form of Keyhole Markup Language (KML) files or similar formats as one or more polygon(s), by specifying the coordinates of the geographic boundary of the production or collection areas using a known coordinate system or any other established method; and

(b) A description of how the location is determined or estimated.

25. For Article 6.4 activities implemented as a PoA, the geographic limits of the activity boundary related to fuels shall be defined at the level of each component project (CP).

6. Demonstration of additionality

26. To demonstrate additionality, activity participants shall apply a regulatory analysis (section 6.1 below). The proposed Article 6.4 activity shall only be considered additional if the regulatory analysis is concluded positively.

27. An analysis of lock-in risk and an analysis using a performance-based approach are conducted at the level of the mechanism methodology for all applicable Article 6.4 activities under this mechanism methodology (see Appendix 7).

28. For Article 6.4 activities implemented as a PoA, the regulatory analysis may be demonstrated in a standardized way at the PoA level by demonstrating compliance at the level of the jurisdiction and defining eligibility criteria based on location within the jurisdiction that enable each CP to demonstrate that the regulatory analysis is concluded positively.

29. Additionality shall be reassessed at the renewal of the crediting period.

6.1. Regulatory analysis

30. Activity participants shall review relevant legal requirements applicable to the host Party and to the use of cooking devices and justify, for each relevant legal requirement, that either:

(a) The law or regulation refers to or formally integrates the Article 6.4 mechanism as an instrument for implementation;[22] or

(b) The emission reductions resulting from the Article 6.4 activity would not occur as a result of the legal requirement, by confirming that all of the following conditions are true:

(i) The legal requirements do not directly or indirectly require the installation of efficient cookstoves in the geographical boundary of the Article 6.4 activity where the project cookstoves are distributed; and

(ii) Public sector finance is not providing a subsidy for the adoption of efficient cookstoves or cooking fuels or energy sources cleaner (i.e., less GHG intensive or lower in pollutant intensity including CO and PM2.5) than fuelwood or artisanal charcoal in the geographic boundary of the Article 6.4 activity where activity cookstoves are distributed. If public sector finance

[22] For example, where the regulations explicitly state that Article 6.4ERs and their generated revenues are to be used as incentives to achieve the emission reductions in a specific sector.

exists, then the activity participant shall apply an investment analysis as described in paragraphs 34 and 35.

31. The analysis shall be based on credible and current evidence and be justified.

32. Activity participants shall further update the regulatory analysis for each monitoring period.

33. If a relevant legal requirement comes into effect during the crediting period, the Article 6.4 activity may only continue generating A6.4ERs for emission reductions occurring up to the date on which a new relevant legal requirement becomes applicable.

34. If relevant public sector finance comes into effect during the crediting period, the Article 6.4 activity may only continue generating A6.4ERs for emission reductions occurring up to the date that it becomes effective, unless activity participants apply an investment analysis in accordance with the valid version of the Investment Analysis tool[23] that demonstrates that:

(a) The public support is insufficient to render the activity financially viable; and

(b) The activity would not be implemented in the absence of additional carbon finance.

35. Public sector finance may include fiscal incentives (e.g. tax or import duty exemptions) or blended finance for the installation or operation of cookstoves.

36. In applying the Investment Analysis tool, activity participants shall:

(a) Identify realistic and credible alternative scenarios to the proposed Article 6.4 activity, which shall include, but not be limited to, the following:

(i) Continued use of existing baseline cooking practices;

(ii) The Article 6.4 activity is implemented without being registered under the Article 6.4 mechanism.

(b) Apply the simple cost analysis if the A6.4 activity does not generate any sources of revenue other than the sale of the A6.4ERs;

(c) Otherwise, apply the investment comparison analysis or, if the only alternative to the proposed Article 6.4 activity is the continuation of the current situation prior to the implementation of the Article 6.4 activity, use the benchmark analysis;

(d) Use the net present value (NPV) as financial indicator where the investment comparison analysis is applied and choose an appropriate indicator where the benchmark analysis is applied, such as internal rate of return (IRR) or NPV;

(e) Assume that the Article 6.4 activity could be implemented by either the activity participants or other entities, unless activity participants demonstrate that in the specific context of the proposed Article 6.4 activity, it can only be implemented by the activity participants and not by any other entities;

(f) Incorporate the public sector finance, including fiscal incentives (e.g. tax or import duty exemptions) or blended finance for the installation or operation of cooking devices, in the calculation of the financial indicator;

[23] See https://unfccc.int/process-and-meetings/the-paris-agreement/article-6/article-64-pacm/mechanism-process/methodologies/a64-amt-002.

(g) Accurately reflect the timing of project cookstove distribution under the Article 6.4 activity and the costs, revenues and potential to apply the public sector finance to the project cookstove units.

37. In conducting the sensitivity analysis, apply a variation of at least +/- 10 per cent to the input values which constitute more than 20 per cent of the total costs or total revenues.

7. Baseline scenario

7.1. Description of the pre-activity scenario in the PDD

38. The pre-activity scenario corresponds to the circumstances immediately prior to the implementation of the Article 6.4 activity.

39. The pre-activity scenario shall be identified and described through the application of a pre-activity survey to the target population that complies with the Sampling and Surveys tool [24]and the modes of data collection set out in the parameter tables of this mechanism methodology, complemented by the requirements set out in Appendix 2, Appendix 3 and Appendix 4. The pre-activity survey shall be undertaken within the year prior to the start date of the first crediting period of the Article 6.4 activity.

40. The following parameters shall be determined through the pre-activity survey:

(a) The existing cooking technology-fuel type combinations in use and the frequency of their use (cooking events per day); and

(b) The household size (in number of persons per household).

41. The pre-activity survey may also be used to assess the applicability condition of demonstrating that the activity has selected technologies and fuels that meet the cooking needs of the target population.[25]

42. The proportion of each cooking technology-fuel type combination in the target population, determined using the pre-activity survey, shall comply with the 95/10 reliability requirement.

43. The findings from the pre-activity survey shall be cross-checked with recent, appropriate (geographically and demographically comparable) information from nationally- or regionally-representative surveys or reputable literature.[26]

(a) For parameters listed in paragraph 40(a) and (b) for which a discrepancy of no more than 10 per cent is identified, the findings of the pre-activity survey shall be used;

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[24] This draft methodological tool is still under development and is yet to be approved by the Supervisory Body. The draft methodology will be revised accordingly if changes to the draft version of the methodological tools are made by the time of their adoption.

[25] For example, whether griddle-based cooking, slow stewing, or deep-frying is the predominant cooking task and that the project cookstove suits the predominant cooking task. Many other characteristics of the cooking needs of the target population could be considered, such as preferred cooking location, fuel size (sticks, logs, etc.), safety issues, etc.

[26] Examples of reputable literature include sources that are peer-reviewed or published by a national agency or multi-lateral organization.

(b) For parameters listed in paragraph 40(a) and (b) for which a discrepancy of more than 10 per cent is identified, both values shall be reported and the following shall be applied:

(i) The value supported by the stronger evidence base and with highest relevance for the target population shall be selected and justified;[27] or

(ii) If the value supported by the stronger evidence base and with highest relevance for the target population cannot clearly be decided, the most conservative value between the pre-activity survey and the values used for cross-check shall apply.

44. The findings from the pre-activity survey also shall be compared to the data sources utilized for the assessment of the presence of cooking technologies equivalent to the project cookstoves (see section 7.1.1) when these are different than the pre-activity survey itself (see paragraph 47). If the pre-activity survey results in a lower percentage of households with a functional cooking technology that has the same or a higher efficiency as the project cookstoves, compared to the percentage used for demonstrating compliance with the applicability condition, then the higher percentage shall be applied.

7.1.1. Assessment of the presence of cooking technologies equivalent to the project cookstoves

45. Activity participants shall evaluate the percentage of households in the target population with a functional cooking technology that is assessed to have the same or a higher efficiency as the project cookstoves (i.e., equivalent to the project cookstoves). As set out in paragraph 13(j) in section 4, this mechanism methodology is not applicable if this proportion is greater than 4.5 per cent.

46. This assessment in paragraph 45 above shall:

(a) Exclude technologies installed under as part of an activity registered under another carbon crediting scheme;

(b) Be based on recent (no more than three years old) and credible data sources; and

(c) Include a documentation of data sources, reference years, and all calculations.

47. Acceptable data sources may include national household energy surveys, census data, or other representative market studies. Where no such sources are available, the pre-activity survey may be used.

48. Where the available data sources report only fuel type and not cookstove technology, and the fuel type alone does not clearly indicate whether the related cookstove is equivalent to the project cookstoves, the activity participants shall use credible supplementary data sources to determine the proportion of users of that fuel who own and regularly use a cookstove equivalent to the project cookstove. Where no such supplementary data are available, the proportion may be obtained from the pre-activity survey.

49. Where functional status or thermal efficiency data are not available from the data sources, activity participants shall apply conservative assumptions to identify equivalent technologies, with justification provided. Where only the primary cooking fuel or

[27] In some cases, this may not be the pre-activity survey.

technology is reported, this shall be interpreted as representing the main technology in regular use.

7.2. Selection of the baseline approaches from paragraph 36 of the rules, modalities and procedures

50. The following approach from the Rules, Modalities and Procedures (RMPs), as per decision 3/CMA.3, is used to determine the baseline in this mechanism methodology:[28]

☐ Best available technologies that represent an economically feasible and environmentally sound course of action, where appropriate.

☒ An ambitious benchmark approach where the baseline is set at least at the average emission level of the best performing comparable activities providing similar outputs and services in a defined scope in similar social, economic, environmental and technological circumstances.

☐ An approach based on existing actual or historical emissions, adjusted downwards to ensure alignment with paragraph 33 of the RMP.

7.3. Application of the selected approach, prior to implementation of a downward adjustment

7.3.1. Procedure for the identification of the baseline scenario

51. For the amount of useful energy delivered for cooking, standardized values of 0.001095 TJ per person per year for charcoal as the primary fuel and 0.001277 TJ per person per year for fuelwood as the primary fuel are assumed. These values reflect the level of energy service required for household cooking in rural settings.[29]

52. Activity participants shall identify the baseline scenario using an ambitious benchmark set at the activity level by applying the following steps.

53. **Step 1. Identify the baseline geographical reference area.** The baseline geographical reference area shall be the same as that of the location of the target population.

54. **Step 2: Identify comparable technologies.** Use the results of the pre-activity survey, after applying any adjustments to the data in response to the cross-check set out in paragraphs 43 and 44, to provide the empirical data on comparable technologies providing similar output as the Article 6.4 activity in the appropriate time period defined as within the one year prior to the start date of the first crediting period of the Article 6.4 activity. Organize the collected data by classifying each cooking technology-fuel type combination identified in the pre-activity survey as a "comparable technology".[30] Analyse the comparable technologies in the following steps.

[28] The approach is selected based on the context of household cooking activities in rural areas with low economic development, where the baseline emissions are subject to the restrictions of limited purchasing power that correlate with the use of low-efficiency cooking technologies and unpriced or low-priced fuels including woody biomass or artisanal charcoal.

[29] See Appendix 7 for more information.

[30] All fuel types or energy sources reported in the pre-activity survey shall be included.

55. **Step 3. Identify the thermal efficiency of each comparable technology**. This shall be determined as follows:

(a) Traditional cookstoves using fuelwood or charcoal fuel shall use the BAU value of the corresponding efficiency in Table 4;

(b) Improved fuelwood and charcoal cookstoves without external energy sources (e.g., for fans for forced draft) or without a gasifier-type combustion chamber shall use:

(i) The assumed values for Improved Cookstoves (ICS) in Appendix 7.2.2; or

(ii) The thermal efficiency values based on the manufacturer's specifications and operation manuals; or

(iii) Test results for the thermal efficiency using the ISO Standard 19867-1:2018 (or any subsequent revision thereof) or equivalent national standards where an accredited laboratory with this capacity is not available in the host country.

(c) Any other improved fuelwood or charcoal cookstoves (e.g. gasifier, forced-draft) or fossil-fuel fired cookstoves (e.g. LPG) shall apply:

(i) A thermal efficiency values based on the manufacturer's specifications; or

(ii) A default value of 50 per cent.

56. **Step 4. Prepare a performance distribution curve.** Plot, separately for each fuel (as applicable), the quantity of units of each comparable technology versus the thermal efficiency from lowest to highest efficiency. Identify the best performing comparable technologies as those units within the top 20^{th} percentile.

57. **Step 5. Calculate the ambitious benchmark.** Apply the following sub-steps:

(a) **Calculate the performance of the best comparable activities.** Calculate, separately for each fuel, the weighted average (by quantity of units) thermal efficiency performance of all the best performing comparable technologies within the top 20^{th} percentile;

(b) **Express the ambitious benchmark as the energy consumption** from fuel use for cooking per person and year (TJ / (person x year)). To derive this value, the standardized value for useful energy delivered for cooking (i.e., 0.001095 TJ per person per year for charcoal as the primary fuel and 0.001277 TJ per person per year for fuelwood as the primary fuel are assumed) shall be divided by the resulting thermal efficiency;

(c) **Comparison with backstop values.** For fuelwood and artisanal charcoal, compare the values resulting from sub-paragraph (a) with the backstop values provided in in Table 3 and use, as a conservative approach, for each fuel type the lower value as the resulting ambitious benchmark ($BM_{BL,l,y}$).

58. When fuels other than the primary fuel are used in the pre-activity scenario, their energy use must be accounted for within the total default useful energy level associated with the

primary fuel, i.e. 0.001095 TJ (for charcoal) or 0.001277 TJ (for fuelwood) useful energy delivered / (person x year), respectively.[31]

59. The identified ambitious benchmark thermal efficiency values resulting from Step 5(a) shall be fixed for five years. The identification of the baseline scenario shall be updated at crediting period renewal or five years after the start date of the crediting period, whichever occurs first. This identification shall re-evaluate the amount of useful energy provided per person per year, the efficiency of baseline cookstoves, and the proportion of cooking technologies and fuel type combinations in the target population.

Table 3. Backstop values for the ambitious benchmark for fuel types eligible under the mechanism methodology[32]

Fuel types	Backstop value for the ambitious benchmark
Fuelwood is the primary fuel	0.0077 TJ / (person x year), equivalent to 0.49 tonnes of fuelwood / (person x year). This value has been calculated based on a thermal efficiency of 16.6 percent and the standardized value for the amount of useful energy delivered for cooking of 0.001277 TJ per person per year for fuelwood. See aAppendix 7 for more details
Artisanal charcoal is the primary fuel	0.0040 TJ / (person x year), equivalent to 0.14 tonnes of charcoal / (person x year). This value has been calculated based on a thermal efficiency of 27.46 percent and the standardized value for the amount of useful energy delivered for cooking of 0.001095 TJ per person per year for charcoal. See aAppendix 7 for more details

7.4. Calculation of unadjusted baseline emissions

60. The unadjusted baseline emissions are calculated separately for the CO_2 emissions subject to reversal risk from the combustion of fuelwood or artisanal charcoal ($BE_{CO2,rr,i,y}$), any CO_2 emissions not subject to reversal risk from the combustion of secondary fuels (i.e., any fuels other than fuelwood or artisanal charcoal), and non-CO_2 (CH_4 and N_2O) emissions that are not subject to reversal risk from direct combustion of fuelwood and artisanal charcoal, from upstream production of artisanal charcoal and also from the combustion of secondary fuels.

[31] For example, if surveys indicate in the baseline that 80 per cent of cooking events are done on wood cookstoves, 15 per cent on cookstoves using artisanal charcoal, and 5 per cent using LPG cookstoves, then the baseline energy consumption would be as follows: wood consumption: 0.80 x 0.001277 TJ / (person x year) / ambitious benchmark efficiency fuelwood = TJ wood fuel. Charcoal consumption: 0.15 x 0.001277 TJ / (person x year) / ambitious benchmark efficiency charcoal = TJ artisanal charcoal fuel. LPG consumption: 0.05 x 0.001277 TJ / (person x year) / ambitious benchmark efficiency LPG = TJ LPG fuel.

[32] Appendix 7 describes how these parameters were derived.

61. The calculations rely on the energy use from fuels in the baseline, fNRB values for fuelwood and charcoal fuels, and emission factors for direct use of fuels in residential settings as well as related to artisanal charcoal production.

7.4.1. Baseline emissions

62. Baseline emissions are calculated using equation (1).

$$BE_y = BE_{CO2,rr,i,y} + BE_{nonCO2,i,y} + BE_{CO2,j,y} + BE_{nonCO2,j,y} \qquad \text{Equation (1)}$$

Where:

BE_y	=	Unadjusted baseline emissions during year *y* (t CO2eq)
$BE_{CO2,rr,i,y}$	=	Unadjusted baseline emissions of CO_2 from GHG reservoirs that are subject to reversal risk for fuel type *i* in year *y* (t CO_2eq)
$BE_{nonCO2,i,y}$	=	Unadjusted non-CO_2 baseline emissions not subject to reversal risk for fuel type *i* in year *y* (t CO_2eq)
$BE_{CO2,j,y}$	=	Unadjusted baseline emissions of CO_2 that are not subject to reversal risk from the combustion of secondary fuel type *j* in year *y* (t CO_2eq)
$BE_{nonCO2,j,y}$	=	Unadjusted non-CO_2 baseline emissions not subject to reversal risk for fuel type *j* in year *y* (t CO_2eq)
i	=	Primary fuel types (fuelwood or charcoal)
j	=	Secondary fuel types (e.g. fossil fuels or dung)
y	=	Calendar year of the crediting period

63. Unadjusted baseline emissions of CO_2 from GHG reservoirs that are subject to reversal risk are calculated using equation (2). Primary fuel types *i* including fuelwood and charcoal shall apply this equation.

$$BE_{CO2,rr,i,y} = \sum_{i} \left(EC_{BL,i,y} \times fNRB_{i,y} \times \left(EF_{i,CO2} + EF_{i,CO2,upstream}\right)\right) \qquad \text{Equation (2)}$$

Where:

$BE_{CO2,rr,i,y}$	=	Unadjusted baseline emissions of CO_2 from GHG reservoirs that are subject to reversal risk for primary fuel types *i* in year *y* (t CO_2eq)
$EC_{BL,i,y}$	=	Energy Consumption of primary fuel types *i* in baseline scenario in year *y* (TJ)
$fNRB_{i,y}$	=	Fraction of non-renewable biomass of primary fuel types i consumed in year *y* (per cent)
$EF_{i,CO2}$	=	CO_2 emission factor for fuel types *i* (t CO_2 / TJ)
$EF_{i,CO2,upstream}$	=	CO_2 emission factor for upstream emissions for primary fuel types *i* (t CO_2 / TJ)
i	=	Primary fuel types (fuelwood or charcoal)
y	=	Calendar year of the crediting period

64. Unadjusted baseline emissions of CO_2 from the combustion of secondary fuel types *j* are not subject to reversal risk and are calculated using equation (3). This equation shall only

be applied when secondary fuel types are identified in the pre-activity survey and incorporated proportionally in the baseline benchmark.

$$BE_{CO2j,y} = \sum_{j} (EC_{BL,j,y} \times EF_{j,CO2})$$ Equation (3)

Where:

$BE_{CO2,j,y}$	=	Unadjusted baseline emissions not subject to reversal risk for secondary fuel types *j* in year *y* (t CO_2eq)
$EC_{BL,j,y}$	=	Consumption of secondary fuel types *j* in baseline scenario in year *y* (TJ)
$EF_{j,CO2}$	=	CO_2 emission factor for secondary fuel types *j* (t CO_2 / TJ)
j	=	Secondary fuel types (e.g. fossil fuels or dung)
y	=	Calendar year of the crediting period (number)

65. Unadjusted non-CO_2 baseline emissions are calculated using equations (4) and (5). Upstream emissions shall not be calculated for secondary fossil fuel types *j*, which is conservative.

$$BE_{nonCO2,i,y} = \sum_{i} \left(EC_{BL,i,y} \times \left(EF_{i,nonCO2} + EF_{i,nonCO2,upstream}\right)\right)$$ Equation (4)

$$BE_{nonCO2,j,y} = \sum_{j} \left(EC_{BL,j,y} \times EF_{j,nonCO2}\right)$$ Equation (5)

Where:

$BE_{nonCO2,i,y}$	=	Unadjusted non-CO_2 baseline emissions for primary fuel types *i* in year *y* (t CO_2eq)
$EC_{BL,i,y}$	=	Consumption of primary fuel types *i* in baseline scenario in year *y* (TJ)
$EF_{i,nonCO2}$	=	Non-CO_2 emission factor for primary fuel types *i* (t CO_2eq /TJ)
$EF_{i,nonCO2,upstream}$	=	Non-CO_2 emission factor for upstream emissions for primary fuel types *i* (t CO_2eq / TJ) (only applicable to charcoal)
$BE_{nonCO2,j,y}$	=	Unadjusted non-CO_2 baseline emissions for secondary fuel types *j* in year *y* (t CO_2eq)
$EC_{BL,j,y}$	=	Consumption of secondary fuel types *j* in baseline scenario in year *y* (TJ)
$EF_{j,nonCO2}$	=	Non-CO_2 emission factor for secondary fuel types *j* (t CO_2eq / TJ)
i	=	Primary fuel types (fuelwood and charcoal)
j	=	Secondary fuel types (fossil fuels or dung)
y	=	Calendar year of the crediting period (number)

66. Activity participants shall determine the total energy consumption in the baseline scenario for primary and secondary fuel types *i* and *j* for the sum all households as indicated in

equations (6) and (7) on the basis of each calendar year (or partial calendar year) of the crediting period:

$$EC_{BL,i,y} = H_y \times BM_{BL,i,y} \times \frac{\Psi_y \times \sum_h Days_{y,h}}{CD_y}$$ Equation (6)

$$EC_{BL,j,y} = H_y \times BM_{BL,j,y} \times \frac{\Psi_y \times \sum_h Days_{y,h}}{CD_y}$$ Equation (7)

Where:

$EC_{BL,i,y}$	=	Consumption of primary fuel types *i* in baseline scenario in year *y* (TJ)
$EC_{BL,j,y}$	=	Consumption of secondary fuel types *j* in baseline scenario in year *y* (TJ)
H_y	=	Average household size in year *y* (number of persons per household)
$BM_{BL,i,y}$	=	Ambitious benchmark-based energy consumption of baseline primary fuel types *i* (TJ / (person x year))
$BM_{BL,j,y}$	=	Ambitious benchmark -based energy consumption of baseline secondary fuel types j (TJ / (person x year))
Ψ_y	=	Percent of activity households that qualify as user households in year *y* (per cent)
$Days_{y,h}$	=	Number of total possible project cookstove days during the year *y* in household *h* (day)
CD	=	Days in a calendar year *y* (day)
h	=	A6.4 activity household
i	=	Primary fuel types (fuelwood or charcoal)
j	=	Secondary fuel types (fossil fuels or dung)
y	=	Calendar year of the crediting period (number)

7.4.1.1. Option 1 (Valid until 31 December 2027)

67. The parameter representing the percentage of activity households with cookstoves present that qualify as user households (Ψ_y), shall be determined based exclusively on usage surveys. In this case, the parameter shall be applied as the lower bound of the confidence interval at the 95/10 reliability level of the survey result. A cap of 90 per cent or 58 per cent shall be applied to the results, even if survey results indicate a higher usage rate.

68. The applicable cap depends on the **customer support actions** taken by the activity as described below.

69. **Customer support actions:** To be eligible to claim up to 90 per cent of the number of total days ($Days_{y,h}$), activity participants not estimating Ψ_y with SUMs shall take the following customer support actions in each monitoring period and provide details of how each condition has been met in the Activity Information Cover Sheet (in Appendix 1) in the monitoring report for each monitoring period of the activity:

    (a) Provide evidence of household participant support activities that shall include providing materials (print, in-person, and video) on how to operate the cookstove to prepare common local foods, how to troubleshoot common operational issues, and how to make minor repairs (including how to access any necessary parts). All household participant communications and materials shall be provided in local language(s) commonly used in the location of the implementation of the Article 6.4 activity; and

(b) Household participants shall be able to contact the activity participant or its representative to access continuous, ongoing support (e.g., maintenance and repair services) through a commonly used, toll-free communications channel that is known to household participants, and contact by household participants shall have occurred during the monitoring period.

70. Activity participants who do not provide evidence for each of these customer support actions may claim up to a cap of 58 per cent as Ψ_y for the corresponding monitoring period. These caps do not apply where Ψ_y is estimated with SUMs.

7.4.1.2. Option 2 (Mandatory from 01 January 2028)

71. The parameter representing the percentage of activity households with cookstoves present that qualify as user households (Ψ_y), shall be estimated through measurements using SUMs, which may be on a sampling basis.

72. In this case, the parameter representing the percent of activity households with cookstoves present that qualify as user households (Ψ_y), shall be applied as the lower bound of the confidence interval at the 95/10 reliability level.

7.5. Application of the downward adjustment

73. No downward adjustment is determined in the calendar year of the start date of the first crediting period since the ambitious benchmark approach (paragraph 36(ii) of the RMPs) is applied.

7.5.1. Downward adjusted baseline emissions in subsequent years

[*Option 1:*

74. No downward adjustment applies to subsequent years as this methodology is exempted from the application of subsequent downward adjustments (see Appendix 7).]

[*Option 2:*

75. A value of 0.01 shall be applied for the annual increase in the downward adjustment (*INDA)*. The first increase shall be applied in the calendar year following the calendar year of the start date of the first crediting period, as determined in section 7.4.

76. The 0.01 annual rate is intended to ensure that baselines remain ambitious over time, while acknowledging the economic realities of clean cooking activities, which often face significant affordability barriers. This downward adjustment for subsequent years applies to all project activities and component projects.

77. The annual increase in the downward adjustment shall be applied starting on 1 January of a calendar year. A pro-rata approach may be used to apply this minimum value to periods other than a full calendar year as per equations (15) and (16) below.

78. The downward adjusted baseline emissions in subsequent years shall be determined as indicated in equations (8), (9), (10), and (11). The downward adjusted baseline emissions are determined based on downward adjusted fuel consumption. This downward

adjustment on the energy consumption is equivalent to determining the downward adjustment directly on the baseline emissions, since the fuel consumption *i* in baseline scenario is the parameter that may vary from year to year, whereas the other components of the baseline emissions calculation ($fNRB_{i,y}$ and emission factors) remain constant (see equations (13) and (14)):

$$BE_{adj,y} = BE_{adj,CO2,rr,i,y} + BE_{adj,nonCO2,i,y} + BE_{adj,CO2,j,y} + BE_{adj,nonCO2,j,y}$$ Equation (8)

$$BE_{adj,CO2,rr,i,y} = \sum_{i} EC_{BL,adj,i,y} \times fNRB_{i,y} \times \left(EF_{i,CO2} + EF_{i,CO2,upstream}\right)$$ Equation (9)

$$BE_{adj,nonCO2,i,y} = \sum_{i} \left(EC_{BL,adj,i,y} \times \left(EF_{i,nonCO2} + EF_{i,nonCO2,upstream}\right)\right)$$ Equation (10)

$$BE_{adj,CO2,j,y} = \sum_{j} \left(EC_{BL,adj,j,y} \times EF_{j,CO2}\right)$$ Equation (11)

$$BE_{adj,nonCO2,j,y} = \sum_{j} \left(EC_{BL,adj,j,y} \times EF_{j,nonCO2}\right)$$ Equation (12)

$$EC_{BL,i,adj,y} = EC_{BL,i,y} \times \left(1 - DA_y\right)$$ Equation (13)

$$EC_{BL,j,adj,y} = EC_{BL,j,y} \times \left(1 - DA_y\right)$$ Equation (14)

Where:

$BE_{adj,y}$	=	Downward adjusted baseline emissions in year *y* (t CO_2eq)
$BE_{adj,CO2,rr,i,y}$	=	Downward-adjusted baseline emissions of CO_2 from GHG reservoirs that are subject to reversal risk for primary fuel types *i* in year *y* (t CO_2eq)
$BE_{adj,nonCO2,i,y}$	=	Downward-adjusted non-CO_2 baseline emissions not subject to reversal risk for secondary fuel types *j* in year *y* (t CO_2eq)
$BE_{adj,CO2,j,y}$	=	Downward-adjusted baseline emissions of CO_2 that are not subject to reversal risk from the combustion of secondary fuel types *j* in year *y* (t CO_2eq)
$BE_{adj,nonCO2,j,y}$	=	Downward-adjusted Non-CO_2 baseline emissions not subject to reversal risk for secondary fuel types *j* in year *y* (t CO_2eq)
$EC_{BL,i,adj,y}$	=	Downward-adjusted consumption of primary fuel types *i* in baseline scenario in year *y* (TJ)
$fNRB_{i,}$	=	Fraction of non-renewable biomass of primary fuel types *i* consumed in year *y* (per cent)
$EF_{i,CO2}$	=	CO_2 emission factor for primary fuel types *i* (t CO_2 / TJ)
$EF_{i,CO2,upstream}$	=	CO_2 emission factor for upstream emissions for primary fuel types *i* (t CO_2 / TJ)

$EF_{i,nonCO2}$	=	Non-CO_2 emission factor for primary fuel types *i* (t CO_2eq / TJ)
$EF_{i,nonCO2,upstream}$	=	Non-CO_2 emission factor for upstream emissions for primary fuel types *i* (t CO_2eq / TJ)
$EC_{BL,i,adj,y}$	=	Downward-adjusted consumption of primary fuel types i in baseline scenario in year *y* (TJ)
$EC_{BL,j,adj,y}$	=	Downward-adjusted consumption of secondary fuel types *j* in baseline scenario in year *y* (TJ)
$EC_{BL,i,y}$	=	Unadjusted consumption of primary fuel types *i* in baseline scenario in year *y* (TJ)
$EC_{BL,j,y}$	=	Unadjusted consumption of secondary fuel types *j* in baseline scenario in year *y* (TJ)
DA_y	=	Downward adjustment applicable to calendar year *y* (dimensionless)
i	=	Primary fuel types (fuelwood or charcoal)
j	=	Secondary fuel types (e.g. fossil fuels or dung)
y	=	Calendar year of the crediting period (number)
$y1$	=	Calendar year of the start date of the crediting period (number)]

79. The downward adjustment applicable to calendar year *y* (DA_y) referred in equations (13) and (14) above shall be determined as follows:

(a) For the first calendar year of the crediting period (y_1), $DA_1 = 0$;

(b) For the second and subsequent calendar years of the crediting period, DA_y shall be calculated as follows:

$$DA_y = INDA \times \left[\frac{CD_y}{nd_y} + (y - y1) - 1\right]$$ Equation (15)

Where:

DA_y	=	Downward adjustment applicable to calendar year *y* (dimensionless)
$INDA$	=	Annual increase in the downward adjustment (dimensionless)
CD_y	=	Number of crediting days in the calendar year *y* that belong to the subsequent year of the crediting period[33]
nd_y	=	Number of days in the calendar year *y*
y	=	Calendar year of the crediting period
$y1$	=	Calendar year of the start date of the first crediting period

(c) For the last calendar year *y* of the last crediting period, DA_y shall be calculated as follows:

$$DA_y = INDA \times [(y - y1) - 1]$$ Equation (16)

[33] For example, if the start date of the first crediting period is 1 October 2025, then in the year 2028, this parameter includes the days from 1 October 2028 to 31 December 2028 (i.e. 92 days).

Where:

DA_y	=	Downward adjustment applicable to calendar year *y* (dimensionless)
$INDA$	=	Annual increase in the downward adjustment (dimensionless)
y	=	Calendar year of the crediting period
$y1$	=	Calendar year of the start date of the first crediting period

7.6. Identification of the conservative Business-as-usual scenario

80. The conservative business-as-usual (BAU) scenario is determined at the level of the mechanism methodology, including with regard to the amount of useful energy provided per person per year and the efficiency of baseline cookstoves. Appendix 7 describes how these parameters were derived.

81. The BAU scenarios for the different Article 6.4 activities eligible under this mechanism methodology are described in Table 4 below:

Table 4. BAU for fuel types eligible under the mechanism methodology

Fuel types	**Conservative BAU**
Fuelwood is the primary fuel	For fuelwood, the value is 0.0098 TJ / (person x year). This is calculated as 0.001277 TJ useful energy delivered / (person x year) provided at the conservative BAU efficiency of 13 per cent. The BAU efficiency is considered to be 11.8 per cent
Charcoal is the primary fuel	For charcoal, the value is 0.0044 TJ / (person x year). This is calculated as 0.001095 TJ useful energy delivered / (person x year) at the conservative BAU efficiency of 25 per cent. The BAU efficiency is considered to be 22.1 per cent

82. In determining the BAU scenario and quantifying the BAU emissions, activity participants shall furthermore identify and incorporate in the BAU, for example by increasing the BAU efficiency or reducing the useful energy delivery default values, as appropriate:

   (a) Any policies that are active or scheduled to take effect within the crediting period, unless they refer to or formally integrate the mechanism as an instrument for implementation.[34] All legal requirements shall be deemed to be enforced while recognizing that regulatory environments vary; and

   (b) Any specific national or sub-national targets for the sector or the type of activity, as long as these are supported by policy frameworks for implementation, but not

[34] The extent to which the policy frameworks in place are sufficient to enable the achievement of the policies/targets may be considered in determining their relevance for the BAU scenario.

general goals that are not specific to the sector or type of activity (e.g. national emissions target). [35]

83. When paragraph 82 does not result in any change to the BAU value defined in Table 4, then the conservative BAU fuel consumption will always be higher than the baseline fuel consumption calculated on the basis of the ambitious benchmark, and it is not required to calculate the conservative BAU emissions ex-ante, since these will always be higher than the unadjusted baseline emissions.

84. Similarly, in this case it is not required to calculate the conservative BAU emissions ex post for each calendar year within the crediting period, since the conservative BAU fuel consumption will always be higher than the baseline fuel consumption calculated on the basis of the ambitious benchmark.

85. When paragraph 82 results in any change to the BAU value defined in Table 4 that make the minimum conservative BAU value[36] lower than both the conservative BAU defined in Table 4 and the ambitious benchmark value defined following section 7.3, then conservative BAU emissions are calculated using equations (17) to (21):

$$BAU_{cons,y} = BAU_{cons,CO2,rr,i,y} + BAU_{cons,nonCO2,i,y} + BAU_{cons,CO2,j,y} + BAU_{cons,nonCO2,j,y}$$ Equation (17)

$$BAU_{cons,CO2,rr,i,y} = \sum_{i} \left(EC_{BL,i,UNC,y} \times fNRB_{i,y} \times \left(EF_{i,CO2} + EF_{i,CO2,upstream}\right)\right)$$ Equation (18)

$$BAU_{cons,nonCO2,i,y} = \sum_{i} \left(EC_{BL,i,UNC,y} \times \left(EF_{i,nonCO2} + EF_{i,nonCO2,upstream}\right)\right)$$ Equation (19)

$$BAU_{cons,CO2,j,y} = \sum_{j} \left(EC_{BL,j,UNC,y} \times EF_{j,CO2}\right)$$ Equation (20)

$$BAU_{cons,nonCO2,j,y} = \sum_{j} \left(EC_{BL,j,UNC,y} \times EF_{j,nonCO2}\right)$$ Equation (21)

Where:

$BAU_{cons,y}$	=	Conservative BAU baseline emissions during year *y*
$BAU_{cons,CO2,rr,i,y}$	=	Conservative BAU baseline emissions that are subject to reversal risk of primary fuel types *i* in year *y* (tCO_2)
$BAU_{cons,nonCO2,i,y}$	=	Conservative BAU non-CO_2 baseline emissions for primary fuel types *i* in year *y* (t CO_2eq)
$BAU_{cons,CO2,j,y}$	=	Conservative BAU baseline emissions of secondary fuel types *i* in year *y* (tCO_2eq)

[35] The extent to which the policy frameworks in place are sufficient to enable the achievement of the policies/targets may be considered in determining their relevance for the BAU scenario.

[36] Defined in line with the procedure of paragraph 77(a)(iii) of the Baseline Standard.

$BAU_{cons,nonCO2,j,y}$	=	Conservative BAU non-CO_2 baseline emissions of secondary fuel types *i* in year *y* (t CO_2eq)
$EC_{BL,i,UNC,y}$	=	Consumption of primary fuel types *i* in the conservative BAU scenario based on uncertainty in year *y* (TJ)
$EC_{BL,j,UNC,y}$	=	Consumption of secondary fuel types *j* in the conservative BAU scenario based on uncertainty in year *y* (TJ)
$fNRB_{i,y}$	=	Fraction of non-renewable biomass of primary fuel types *i* consumed in year *y* (per cent)
$EF_{i,CO2}$	=	CO_2 emission factor for primary fuel types *i* (t CO_2eq/TJ)
$EF_{i,CO2,upstream}$	=	CO_2 emission factor for upstream emissions for primary fuel types *i* (t CO_2 / TJ)
$EF_{i,\ nonCO2}$	=	Non-CO_2 emission factor for primary fuel types *i* (t CO_2eq / TJ)
$EF_{i,\ nonCO2,\ upstream}$	=	Non-CO_2 emission factor for upstream emissions for primary fuel types *i* (t CO_2eq / TJ)
$EF_{j,CO2}$	=	CO_2 emission factor for secondary fuel types *i* (t CO_2 / TJ)
$EF_{j,nonCO2}$	=	Non-CO_2 emission factor for secondary fuel types *i* (t CO_2eq / TJ)
i	=	Primary fuel types (fuelwood or charcoal)
j	=	Secondary fuel types (e.g. fossil fuels or dung)
y	=	Calendar year of the crediting period (number)

86. Activity participants shall determine energy consumption for the sum all households in the baseline scenario using the benchmark derived from the conservative BAU efficiency based on uncertainty for fuelwood or charcoal consumption as indicated in equations (22) and (23):

$$EC_{BL,i,UNC,y} = H_y \times BM_{BL,i,UNC,y} \times \frac{\Psi_y \times \sum_h Days_{y,h}}{CD_y}$$ Equation (22)

$$EC_{BL,j,UNC,y} = H_y \times BM_{BL,j,UNC,y} \times \frac{\Psi_y \times \sum_h Days_{y,h}}{CD_y}$$ Equation (23)

Where:

$EC_{BL,i,UNC,y}$	=	Consumption of primary fuel types *i* in the conservative BAU scenario based on uncertainty in year *y* (TJ)
$EC_{BL,j,UNC,y}$	=	Consumption of secondary fuel types *j* in the conservative BAU scenario based on uncertainty in year *y* (TJ)
H_y	=	Average household size in year *y* (number of persons per household)
$BM_{BL,i,UNC,y}$	=	Conservative BAU scenario based on uncertainty energy consumption of primary fuel types *i* (TJ / (person x year))
$BM_{BL,j,UNC,y}$	=	Conservative BAU scenario based on uncertainty energy consumption of secondary fuel types *j* (TJ / (person x year))
Ψ_y	=	Percent of activity households with cookstoves present, that qualify as user households in year *y* (per cent)

$Days_{y,h}$	=	Number of total possible project cookstove days during the year *y* in household *h* (days)
CD_y	=	Days in a calendar year *y* (days)
i	=	Primary fuel types (fuelwood or charcoal)
j	=	Secondary fuel types (fossil fuels or dung)
y	=	Calendar year of the crediting period
h	=	A6.4 activity household

87. This calculation shall not include any caps on Ψ_y when applying Option 1 in section 7.4.1, or shall use the mean value of Ψ_y when applying Option 2 in section 7.4.1.

88. The BAU scenario shall be determined ex ante and described in the PDD at the start of the first crediting period for the same duration as the crediting period of the proposed Article 6.4 activity, and shall be redetermined at each crediting period renewal.

89. As required in line with paragraph 85, the quantification of the BAU emissions shall be determined:

(a) Ex ante and in the PDD at the start of the first crediting period for the same duration as the crediting period of the proposed Article 6.4 activity and specified for each calendar year within the crediting period; and

(b) Ex post for each calendar year within the crediting period.

7.7. Comparison of crediting baselines

90. Activity participants shall compare, in the PDD, the downward adjusted baseline ($BE_{adj,y}$) determined in section 7.5 with the conservative BAU baseline ($BAU_{cons,y}$) determined in paragraph 79 above, as required.

7.7.1. Comparison ex-ante

91. If, as a result of the comparison, the ex-ante $BAU_{cons,y}$ is lower than the ex-ante $BE_{adj,y}$ for any calendar year or cumulatively over the crediting period, then activity participants shall follow the methods in section 7.6 and apply either the applicable cap on Ψ_y or the lower bound of the confidence interval of Ψ_y, to ensure that the credited baseline is lower than the conservative BAU baseline for each calendar year and cumulatively for the crediting period, thereby using a discounted value of conservative BAU for this purpose.

7.7.2. Comparison ex-post

92. If required due to the ex-ante conditions, or when paragraph 82 results in any change to the BAU value defined in Table 4 during the crediting period that make the minimum conservative BAU value lower than both the conservative BAU defined in Table 4 and the ambitious benchmark value defined following section 7.3, then activity participants shall also compare in monitoring reports, for each individual calendar year during the crediting period, the ex-post calculated [downward adjusted] baseline for the year and the ex-post calculated conservative BAU baseline for the same year to confirm that the [downward adjusted] baseline is lower than the conservative BAU baseline. If it is not, then the conservative BAU baseline shall be used in monitoring reports for that specific calendar year.

93. In turn, baseline emissions shall be determined as follows:

$$BE_{final,y} = \text{MIN}(BE_{adj,y}, BAU_{cons,y})$$ Equation (24)

Where:

$BE_{final,y}$	=	Final [downward adjusted] baseline emissions during year *y* (t CO_2eq)
$BE_{adj,y}$	=	Downward adjusted baseline emissions in year *y* (t CO_2eq)
$BAU_{cons,y}$	=	Conservative BAU baseline emissions during year *y*
y	=	Calendar year of the crediting period (number)

8. Activity scenario

8.1. Application of multiple activity scenarios

94. If an Article 6.4 activity is promoting multiple project cookstove technologies, project cookstoves with similar design and performance characteristics (defined as having the same combustion technology and within 5 per cent thermal efficiency per ISO 19867-1 or equivalent national standards where an accredited laboratory with this capacity is not available in the host country may be included under a single activity scenario. If not, they must be treated as independent activity scenarios and included as different CPs in a PoA.

8.2. Activity emissions

8.2.1. Fuel consumption in the activity scenario

95. Activity emissions are calculated on an energy basis, while the amount of fuel consumed by the Article 6.4 activity is measured on a mass basis in the KPTs. Generally, the necessary conversions from mass to energy are conducted using equation (25):

$$EC_i = FC_i \times NCV_i$$ Equation (25)

Where:

EC_i	=	Energy consumption for the fuel *i* (TJ)
FC_i	=	Quantity of primary fuel type *i* consumed (tonnes)
NCV_i	=	Net calorific value for primary fuel type *i* (TJ / tonnes)
i	=	Primary fuel types (fuelwood or charcoal)

8.2.2. Activity emissions prior to Hawthorne effect adjustment

96. Activity emissions before any Hawthorne effect adjustment are calculated using equation (26):

$$AE_{unadj,y} = AE_{CO2,rr,i,y} + AE_{nonCO2,i,y} + AE_{CO2,j,y} + AE_{nonCO2,j,y}$$ Equation (26)

Where:

$AE_{unadj,y}$	=	Activity emissions during year y, before applying any Hawthorne effect adjustment (t CO_2eq)

$AE_{CO2,rr,i,y}$	=	Activity emissions of CO_2 from GHG reservoirs that are subject to reversal risk for fuel *i* in year *y* (t CO_2)
$AE_{nonCO2,i,y}$	=	Non-CO_2 activity emissions from GHG reservoirs that are not subject to reversal risk for fuel *i* in year *y* (t CO_2eq)
$AE_{CO2,j,y}$	=	Activity emissions of CO_2 that are not subject to reversal risk from the combustion of secondary fuel types *j* in year *y* (t CO_2)
$AE_{nonCO2,j,y}$	=	Non-CO_2 activity emissions not subject to reversal risk for secondary fuel types *j* in year *y* (t CO_2eq)
i	=	Primary fuel types (fuelwood or charcoal)
j	=	Secondary fuel types (fuelwood or charcoal)
y	=	Calendar year of the crediting period (number)

97. Activity emissions of CO_2 from GHG reservoirs that are subject to reversal risk are calculated using equation (27). Primary fuels *i*, including fuelwood and charcoal, shall apply this equation:

$$AE_{CO2,rr,i,y} = \sum_{i} \left(EC_{proj,i,y} \times fNRB_{i,y} \times \left(EF_{i,CO2} + EF_{i,CO2,upstream}\right)\right)$$ Equation (27)

Where:

$AE_{CO2,rr,i,y}$	=	Activity emissions of CO_2 from GHG reservoirs that are subject to reversal risk (t CO_2)
$EC_{proj,i,y}$	=	Consumption of primary fuel types *i* in year *y* (TJ)
$fNRB_{i,y}$	=	Fraction of non-renewable biomass of primary fuel types *i* consumed in year *y* (per cent)
$EF_{i,CO2}$	=	CO_2 emission factor for primary fuel types *i* (t CO_2 / TJ)
$EF_{i,CO2,upstream}$	=	CO_2 emission factor for upstream emissions for primary fuel types *i* (t CO_2 / TJ)
i	=	Primary fuel types (fuelwood or charcoal)
y	=	Calendar year of the crediting period

98. Other activity emissions of CO_2 are calculated using equation (28). This equation shall only be applied when secondary use of fuels *j* is identified in the pre-activity survey and incorporated proportionally in the baseline benchmark or in case the use of new secondary fuels that were not present during the pre-activity survey are detected during the KPT.

$$AE_{CO2,j,y} = \sum_{j} EC_{proj,j,y} \times EF_{j,CO2}$$ Equation (28)

Where:

$AE_{CO2,j,y}$	=	Other activity emissions of CO_2 (t CO_2)
$EC_{proj,j,y}$	=	Consumption of secondary fuel types *j* in year *y* (TJ)
$EF_{i,CO2}$	=	CO_2 emission factor for secondary fuel types *j* (t CO_2 /TJ)
j	=	Secondary fuel types (e.g. fossil fuels or dung)

y	=	Calendar year of the crediting period

99. Non- CO_2 activity emissions from all type of fuels are calculated using equations (29) and (30). Upstream emissions shall not be calculated for secondary fuel types *j*.

$$AE_{nonCO2,i,y} = \sum_{i} \left(EC_{proj,i,y} \times \left(EF_{i,nonCO2} + EF_{i,nonCO2,upstream}\right)\right) \quad \text{Equation (29)}$$

$$AE_{nonCO2,j,y} = \sum_{j} \left(EC_{proj,j,y} \times EF_{j,nonCO2}\right) \quad \text{Equation (30)}$$

Where:

$AE_{nonCO2,i,y}$	=	Non- CO_2 activity emissions from primary fuel types *i* (t CO_2eq)
$EC_{proj,i,y}$	=	Consumption of primary fuel types *i* in activity scenario in year *y* (TJ)
$EF_{i,nonCO2}$	=	Non-CO_2 emission factor for primary fuel types *i* (t CO_2eq/TJ)
$EF_{i,nonCO2,upstream}$	=	Non-CO_2 emission factor for upstream emissions for primary fuel types *i* (t CO_2eq / TJ)
$AE_{nonCO2,j,y}$	=	Non- CO_2 activity emissions from secondary fuel types *j* (t CO_2eq)
$EC_{proj,j,y}$	=	Consumption of secondary fuel types j in activity scenario in year *y* (TJ)
$EF_{j,nonCO2}$	=	Non-CO_2 emission factor for secondary fuel types *j* (t CO_2eq / TJ)
i	=	Primary fuel types (fuelwood or charcoal)
j	=	Secondary fuel types (e.g. fossil fuels or dung)
y	=	Calendar year of the crediting period

100. Activities shall determine energy consumption in the activity scenario. Adjustments to account for the Hawthorne effect are included below differentiated by application (or non-application) of SUMs.

101. Fuel consumption in the activity scenario is determined through a representative sample with direct measurements of fuel using KPTs in compliance with the sampling and surveys tool. The KPTs shall measure use of all fuel types by all cooking devices (activity cookstoves and otherwise) in the activity household. The results from the KPTs shall be converted to energy terms following equation (25) prior to their aggregation and use in equations (31) and (32) on the basis of each calendar year (or partial calendar year) of the crediting period.

$$EC_{proj,i,y} = H_y \times FEC_{proj,i,y} \times \frac{\Psi_y \times \sum_h Days_{y,h}}{CD_y} \quad \text{Equation (31)}$$

$$EC_{proj,j,y} = H_y \times FEC_{proj,j,y} \times \frac{\Psi_y \times \sum_h Days_{y,h}}{CD_y} \quad \text{Equation (32)}$$

Where:

$EC_{proj,i,y}$	=	Consumption of fuel *i* in activity scenario in year *y* (TJ)
$EC_{proj,j,y}$	=	Consumption of secondary fuel *j* in activity scenario in year *y* (TJ)
H_y	=	Average household size in year *y* (number of persons in household)
$FEC_{proj,i,y}$	=	Energy consumption of primary fuel *i* for activity households as measured by the activity KPT during year *y* (TJ / (person x year))
$FEC_{proj,j,y}$	=	Energy consumption of secondary fuel *j* for activity households as measured by the activity KPT during year *y* (TJ / (person x year))
Ψ_y	=	Percent of activity households with cookstoves present, that qualify as user households in year *y* (per cent)
$Days_{y,h}$	=	Number of total possible project cookstove days during the year *y* in household *h*
CD_y	=	Days in a calendar year *y* (days)
h	=	A6.4 activity household
i	=	Primary fuel types (fuelwood or charcoal)
j		Secondary fuel types (e.g. fossil fuel or dung)
y	=	Calendar year of the crediting period

102. Activity participants shall estimate the amount of useful energy delivered in the activity scenario, by summing for all cookstove technology and fuel type combinations the energy consumption of the respective fuel types *i* ($FEC_{proj,i,y}$) multiplied by the efficiency of the type of cookstove in which the fuel is used in the activity scenario. For project cookstoves, the efficiency shall be the same as that reported in Data / Parameter table 2 under section 15. For conventional fuelwood or charcoal cookstoves, the efficiency shall be the BAU value reported in Table 4. Any other improved fuelwood or charcoal cookstoves (e.g. gasifier, forced-draft) or fossil-fuel fired cookstoves (e.g., LPG) shall apply thermal efficiency values based on manufacturer's specifications.

103. If the amount of useful energy delivered in the activity scenario is at least as much as the standardized value applied in the determination of the ambitious benchmark (i.e. 0.001095 TJ / (person x year) for charcoal as the primary fuel or 0.001277 TJ / (person x year for fuelwood as the primary fuel), then no further action is required. If, on the other hand, it is lower than this value, then the baseline emissions calculation shall be pro-rated by substituting the standardized values by the real amount of useful energy delivered in the activity scenario in the determination of the ambitious benchmark in section 7.3, including for re-determining the backstop values provided in Table 3, and the subsequent application of the benchmark values as the input to determine the baseline fuel energy for use in equations (6) and (7).[37]

[37] For example, if this analysis determines that the activity scenario provides 0.001100 TJ / (person x year) useful energy delivered for fuelwood as the primary fuel, where 80 per cent of cooking energy is from wood, 15 per cent from artisanal charcoal, and 5 per cent from LPG, then the baseline fuel energy consumption would be re-determined as follows: wood consumption: 0.80 x 0.001100 TJ / (person x year) / ambitious benchmark efficiency fuelwood = TJ wood fuel. Charcoal consumption: 0.15 x 0.001100 TJ / (person x year) / ambitious benchmark efficiency charcoal = TJ artisanal charcoal fuel. LPG consumption: 0.05 x 0.001100 TJ / (person x year) / ambitious benchmark efficiency LPG = TJ LPG fuel.

8.2.3. Adjustment for the potential impact of the Hawthorne effect

104. To account for the potential impacts of the Hawthorne Effect on activity KPTs, the methodology applies a Hawthorne effect adjustment factor (HE_{ind}). This factor adjusts the calculated emissions reductions. For methodological consistency, the adjustment is incorporated directly in the activity emissions calculation.

105. The final activity emissions (AE_y) are calculated using equation (33).

$$AE_y = AE_{unadj,y} + \left(BE_{final,y} - AE_{unadj,y}\right) \times (1 - HE_{ind})$$ Equation (33)

Where:

AE_y	=	Final activity emissions during year *y* (t CO_2eq)
$AE_{unadj,y}$	=	Activity emissions during year *y*, before applying any Hawthorne effect adjustment (t CO_2eq)
$BE_{final,y}$	=	Final downward adjusted baseline emissions during year *y* (t CO_2eq)
HE_{ind}	=	Hawthorne Effect adjustment factor (per cent)
y	=	Calendar year of the crediting period (number)

106. Activities shall complement KPTs and surveys with SUMs measurements to determine the activity specific Hawthorne effect adjustment factor (HE_{ind}), apply the ratio of project cookstove usage (cooking events/day) measured during the KPT to that measured during the month prior to or following the KPT to adjust the activity emissions estimate, such that in equation (33), HE_{ind} equals the result of this ratio (see equation (34)). This requires that SUMs be applied to all activity cookstoves in households where the KPT is performed. See section 14 for SUMs monitoring requirements and Appendix 6 for SUMs requirements and best practice guidance. The use of SUMs shall be applied for this purpose from 01 January 2028.

107. Otherwise, activity emissions shall be adjusted to account for the Hawthorne effect, such that in equation (33), HE_{ind} equals to 75 per cent.[38] The use of the default Hawthorne effect adjustment factor is valid through 31 December 2027.

$$HE_{ind} = \mathrm{MIN}(1, \frac{PCE_m}{PCE_{KPT}})$$ Equation (34)

Where:

HE_{ind}	=	Adjustment to calculated emission reductions for the Hawthorne effect (per cent)
PCE_m	=	Average activity cookstove cooking events per day over 1 month from SUMs measurements (number of events)
PCE_{KPT}	=	Average activity cookstove cooking events per day over the activity KPT from SUMs measurements (number of events)

[38] See Appendix 7 for further details on the Hawthorne effect, the activity emissions adjustment, and how the default percentage was derived.

9. Leakage

108. The leakage assessment is determined at the level of the mechanism methodology. Appendix 7 describes how the estimated leakage emissions parameter was derived.

109. The leakage assessment concludes that no negative leakage emissions are likely attributable to the Article 6.4 activity, apart from emissions associated with materials, manufacture and transport of the project cookstoves and are estimated as follows:

$$LE_y = AC_{New,y} \times E_{LE}$$ Equation (35)

Where:

	=	Leakage emission in year y (t CO_2eq)
	=	Quantity of new project cookstoves added to the activity in year *y*
	=	Estimated leakage emissions per project cookstove (t CO_2eq / cookstove)
y	=	Calendar year of the crediting period

110. For industrially manufactured cookstoves, imported appliances, or stoves constructed predominantly of refined metals (e.g., steel, aluminum), leakage is estimated using the default value of 0.0128 t CO_2eq per cookstove or established based on a verified Life Cycle Analysis (LCA) study.

111. For artisanal, built-in-place, or domestically constructed cookstoves manufactured predominantly (>75 per cent by mass) from locally sourced, non-industrial earthen materials (e.g., unbaked clay, mud, brick) where transport distances are minimal, leakage is estimated using the default value of 0.0064 t CO_2eq per cookstove or established based on a verified LCA study.

10. Non-permanence provisions

10.1. Monitoring and reporting requirements

112. For the reasons described in Appendix 7, activity participants shall not be required to:

(a) Monitor the GHG reservoirs included in Table 2, either in the crediting period or post-crediting monitoring period;

(b) Submit reversal-related notifications or reports about potential or actual reversals in relation to the GHG reservoirs included in Table 2; or

(c) Perform post-reversal actions (i.e., to mitigate any reversals that may occur).

10.2. Buffer pool contributions

113. Activity participants shall apply the “Methodological tool: Reversal risk assessment” (A6.4-AMT-0XX) to determine the parameter $F_{buffer,i,t}$ in equation (36), which determines the

number of A6.4ERs to be contributed to the reversal risk buffer pool account for each applicable primary fuel type *i*.[39]

114. All A6.4ERs contributed to the reversal risk buffer pool account under this mechanism methodology shall immediately be cancelled by the Mechanism Registry Administrator for the purpose of remediating future reversals and appropriately labelled as such.

115. In applying equation (36), when $BAU_{cons,y}$ is lower than $BE_{adj,y}$ for the calendar year *y,* such that activity participants apply the methods in section 7.6 to set the baseline, then activity participants shall use the parameter $EC_{BL,i,UNC,y}$ in place of $EC_{BL,i,adj,y}$.

$$6.4ER_{buffer,y} = \sum_{i} \left(\left(EC_{BL,i,adj,y} - EC_{proj,i,y} \right) \times \left(fNRB_{i,y} \times \left(EF_{i,CO2} + EF_{i,CO2,upstream} \right) \right) \right) \times F_{buffer,i,t}$$ Equation (36)

Where:

$A6.4ER_{buffer,y}$	=	The number of A6.4ERs to be forwarded to the reversal risk buffer pool account for year *y* (t CO_2)
$EC_{BL,i,adj,y}$	=	Downward adjusted consumption of fuel *i* in baseline scenario in year *y* (TJ)
$EC_{proj,i,y}$	=	Consumption of fuel *i* in year *y* (TJ)
$fNRB_{i,y}$	=	Fraction of non-renewable biomass of biomass fuel type *i* consumed in year *y* (per cent)
$EF_{i,CO2}$	=	CO_2 emission factor for fuel *i* (t CO_2 / TJ)
$EF_{i,CO2,upstream}$	=	Upstream CO_2 emission factor for fuel *i* (t CO_2 / TJ)
$F_{buffer,i,t}$	=	The fraction of the A6.4ERs with respect to the GHG reservoir above-ground woody biomass in landscape and for the period of time covered by a monitoring report t that is to be contributed to the reversal risk buffer bool account for fuel *i* (per cent)
i	=	Primary fuel types (fuelwood or charcoal)
y	=	Calendar year of the crediting period
t	=	Period of time covered by a monitoring report

11. Emission reductions

116. Total emission reductions for activities are calculated using equation (37), which is equivalent to the total number of A6.4ERs to be issued with respect to the Article 6.4 activity over the period *y*.

$$ER_y = BE_{final,y} - AE_y - LE_y$$ Equation (37)

[39] This draft methodological tool is still under development and is yet to be approved by the Supervisory Body. The draft methodology will be revised accordingly if changes to this draft version of this methodological tool is made by the time of their adoption.

Where:

ER_y	=	Emission reductions for the activity during year y (t CO_2eq)
$BE_{final,y}$	=	Final baseline emissions during year y (t CO_2eq)
AE_y	=	Activity emissions during year *y* (t CO_2eq)
LE_y	=	Leakage emissions during year *y* (t CO_2eq)
y	=	Calendar year of the crediting period (number)

117. For informational purposes, the following equation reflects the number of A6.4ERs to be issued to the accounts of activity participants.[40]

$$A6.4ER_{activity,y} = ER_y - A6.4ER_{SOP,y} - A6.4ER_{OMGE,y} - A6.4ER_{buffer,y} \quad \text{Equation (38)}$$

Where:

$A6.4ER_{activity,y}$	=	The number of Article 6.4ERs to be forwarded to the accounts of the activity participants for year y (t CO_2eq)
ER_y	=	Emission reductions for the activity during year *y* (t CO_2eq)
$A6.4ER_{SOP,y}$	=	The number of A6.4ERs to be forwarded or first-transferred, where applicable, to an account of the Adaptation Fund for year *y* (t CO_2eq)
$A6.4ER_{OMGE,y}$	=	The number of A6.4ERs to be forwarded to the account for cancellation towards delivering overall mitigation in global emissions for year *y* (t CO_2eq)
$A6.4ER_{buffer,y}$	=	The number of A6.4ERs to be forwarded to the reversal risk buffer pool account for year y (t CO_2eq)
y	=	Calendar year of the crediting period

118. This mechanism methodology addresses uncertainty in the determination of individual parameters and through conservative assumptions. It is therefore not necessary to determine the overall uncertainty of the aggregated emission reductions.[41]

12. Avoidance of double counting

119. All activity participants shall demonstrate that the Article 6.4 activity will not result in double counting by:

(a) Providing evidence, in each monitoring report, that the outcomes from the Article 6.4 activity (e.g., reduced emissions from household cooking) for which they intend

[40] Following the requirements of the "Procedure: Article 6.4 mechanism registry" (A6.4-PROC-REGS-001). See https://unfccc.int/sites/default/files/resource/A6.4-PROC-REGS-001.pdf.

[41] Paragraph 13 in the Annex to the "Standard: Setting the baseline in mechanism methodologies" requires that emission reductions are very unlikely to be overestimated. To ensure that this requirement is met, the MEP conducted a Monte Carlo analysis to assess the distribution of the likely emission reductions, noted the emission reductions at the P10 percentile of this distribution, and determined that the emission reductions resulting from the methodology generally are around the P10 quantity, i.e. the mechanism methodology is unlikely to overestimate emission reductions with 90% confidence. Based on the analysis, the MEP concluded that the use of conservative values, as specified under this mechanism methodology, ensures that the requirement in paragraph 13 in the Annex to the "Standard: Setting the baseline in mechanism methodologies" is met.

to request issuance of A6.4ERs are not also claimed in other environmental markets, accounting frameworks or carbon crediting programmes (e.g., jurisdictional REDD), except for outcomes not related to reducing GHG emissions (e.g., air contaminant reductions or social impacts); and

(b) Demonstrating that the reported GHG emission reductions for which they intend to request issuance of A6.4ERs do not overlap with mandatory domestic mitigation schemes (e.g., emissions trading systems), or that measures are in place to ensure that any relevant impacts of the activity (e.g., the GHG emission reductions achieved) are not counted towards the achievement of targets or obligations under the mandatory domestic mitigation scheme (e.g., by cancelling allowances from the emissions trading system before issuing carbon credits) if the overlap exists,[42] by:

(i) Declaring and providing evidence in each monitoring report that the Article 6.4 activity and its baseline scenario (e.g., heat energy for household cooking using harvested biomass) do not fall within the scope of any mandatory domestic mitigation scheme; or

(ii) Where the Article 6.4 activity or its baseline scenario fall within the scope of a mandatory domestic mitigation scheme, activity participants may:

a. Provide evidence in each monitoring report that the mitigation outcomes of the Article 6.4 activity are not counted in the mandatory mitigation scheme to reduce the obligations by the entities covered by the scheme; or

b. Demonstrate that activity participants are not requesting the issuance of A6.4ERs for any emission reductions resulting from a component of the Article 6.4 activity that falls within the scope of the mandatory domestic scheme.

120. Evidence to demonstrate avoidance of double counting may include, as applicable: official confirmation from the host Party DNA or relevant national authority, declarations from activity participants and implementation partners, among others.

121. Despite paragraph 119 above, where the policy for establishing the framework or environmental market or for establishing the mandatory domestic mitigation scheme refers to or formally integrates the mechanism as an instrument for implementation, participation in such a framework or environmental market or domestic mitigation scheme does not result in double counting.

122. All Article 6.4 activities under this mechanism methodology shall also employ explicit evidence of consent, for example signed A6.4ER waiver certificates (see Appendix 2), with all participating households under the Article 6.4 activity, indicating that A6.4ERs can only be claimed by the activity participants and that the households shall not claim A6.4ERs or carbon credits from any other carbon crediting programme.

[42] When full or partial impact of the activity is covered under mandatory domestic mitigation scheme and counted towards the achievement of targets and obligations under mandatory domestic mitigation scheme, the relevant share of the impact shall be deducted by the activity participants from the amount requested for issuance.

13. Demonstration of alignment with the policies, options and implementation plans of the host Party with regard to its nationally determined contribution and long-term low greenhouse gas emission development strategies and the long-term temperature goal of the Paris Agreement and long-term goals of the Paris Agreement

123. The activity participants applying this mechanism methodology shall ensure that the activity complies with paragraph 10 in Appendix of the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004).

14. Monitoring Requirements

14.1. Monitoring activity schedule for activities

124. Table 5 below presents the monitoring activities schedule for activities.

Table 5. Monitoring activities schedule for activities

Monitoring Activity	Prior to validation	Prior to first verification	Annual	Every monitoring period
Pre-activity studies				
Pre-activity survey	X			
Activity studies				
Usage surveys			X	
Usage SUMs measurements			Continuous	
Activity KPTs (energy consumption measurement) & Activity KPT survey				X (must be performed no less frequently than every two years even if the monitoring period is longer)
SUMs Hawthorne effect measurements		X (during the first monitoring period of the crediting period)		
Ongoing monitoring tasks				
Maintenance of total sales and service records, and activity databases	Continuous	Maintenance of total sales and service records, and activity databases	Continuous	Maintenance of total sales and service records, and activity databases

14.2. Other monitoring requirements

125. When the activity participants apply for crediting period renewal, all methodological parameters shall be reassessed as per a valid version of a mechanism methodology used at the time of renewal.

14.2.1. Kitchen performance tests

126. KPTs shall be undertaken every two years, within the last four months of the monitoring period for which emission reductions are quantified (if the monitoring period itself is longer than four months), rather than at the beginning of a monitoring period. For a five-year crediting period, activity participants should conduct activity KPTs at the end of year 2 and year 4. They may either conduct an additional KPT in year 5 or if the crediting period is renewed, apply the results from KPTs conducted in year 6.

14.2.2. Seasonality

127. Activities are required to account for the impact of seasonal variation on fuel-use measurements in the activity scenarios. Prior to validation, activities shall collect data during the pre-activity survey on the relative fuel use at different times of the year. Where space heating has been identified in the pre-activity scenarios, project cookstoves may also be used in an ancillary way to meet space heating requirements e.g. under seasonal variation. In any case, the primary use of the project cookstove shall not be to meet space heating requirements. Activity participants shall incorporate the resulting information into their monitoring plan design and justify on the Activity information cover sheet how the approach they are taking will result in activity fuel use measurements focused on cooking events. For example, if ancillary space heating is common in the activity area in a certain season, activity participants shall schedule activity KPT measurements outside this season.

128. If an accurate approach cannot be taken, then activity participants shall instead select and justify a conservative approach.

14.2.3. Stove use monitoring (SUMs)

129. The algorithm for estimating cooking events shall be able to reliably distinguish cooking events from other potential factors that could be interpreted as cooking events that are caused by external reasons (e.g., temperature fluctuations from typical diurnal patterns).

130. The algorithms shall be clearly presented publicly in the PDD with associated equations or logic rules.

131. The same algorithm and SUM device type should be used for the duration of the Article 6.4 activity. If a different SUM device type or algorithm is used, then the activity shall demonstrate that the stove use estimates between the two approaches are unbiased. This can be demonstrated by conducting a side-by-side comparison in a representative subsample of households, where both devices/algorithms are applied simultaneously, and the resulting cooking event estimates are compared. Statistical tests such as paired t-tests, regression analyses, or Bland–Altman plots may be used to assess whether systematic bias exists. The results of these tests, along with all supporting data and documentation, shall be provided to the DOE.

132. Sampling shall meet the 95/10 confidence / reliability guidelines.

133. SUMs sampling protocols (installation, placement, downloading) and algorithms used to convert raw data into cooking events shall not change between sampling during KPTs and sampling following KPTs, nor from year to year.

134. Activity households in the SUMs sample shall not receive any support different or additional to those not included in the sample.

135. Activity participants shall ensure that photographs of the SUMs placement in each sampled household are taken and retained as part of the monitoring record.

136. For activities using the KPT and SUMs approach described in section 8.2.3, the average of the cookstove use events per day during the full 30 days of stove use monitoring shall be used to adjust for potential Hawthorne effects. If SUMs data is incomplete or missing, it shall be omitted from the analysis.

15. Data and parameters not monitored

Data / Parameter table 1.

Data/parameter:	**Technical lifetime of the project cookstove**
Description	The total period during which the cookstove can be expected to remain functional and deliver its intended level of service
Data unit	Years or hours
Equations referred	N/A
Purpose of data	☒ Baseline Scenario ☐ Activity Scenario ☐ Leakage
Value(s) applied	
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	Technical lifetime of the project cookstoves shall be determined based on the manufacturer's specifications and operation manuals, or in the absence of these, e.g., in the case of artisanal cookstoves, based on a third-party assessment by a certified or suitably qualified expert
Treatment of uncertainty	N/A
Additional comments	Used for informational purposes and not used in any equation

Data / Parameter table 2.

Data/parameter:	**Thermal efficiency of the project cookstove**
Description	Thermal efficiency using the ISO Standard 19867-1:2018 (or any subsequent revision thereof), or equivalent national standards where an accredited laboratory with this capacity is not available in the host country
Data unit	per cent
Equations referred	N/A
Purpose of data	☒ Baseline Scenario ☐ Activity Scenario ☐ Leakage
Value(s) applied	

Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	Determined using the ISO Standard 19867-1:2018 Clean cookstoves and clean cooking solutions — Harmonized laboratory test protocols (or any subsequent revision thereof), or equivalent national standards where an accredited laboratory with this capacity is not available in the host country For artisanal cookstoves, at least three randomly selected samples of each cookstove model must be used when testing for ISO thermal efficiency. The mean value from the three samples shall be applied
Treatment of uncertainty	Results of measurements shall be reported with their uncertainty range, for informational purposes
Additional comments	Used for demonstrating compliance with the applicability conditions and for estimating useful energy delivered in the project

Data / Parameter table 3.

Data/parameter	CD_y
Description	Days in a calendar year *y*
Data unit	Number
Equations referred	Equation (6), (7), (15), (22), (23), (31), (32)
Purpose of data	☒ Baseline Scenario ☐ Activity Scenario ☐ Leakage
Value(s) applied	365 (non-leap year) or 366 (leap year)
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	N/A
Treatment of uncertainty	N/A
Additional comments	-

Data / Parameter table 4.

Data/parameter	$EF_{i,CO2}$
Description	CO_2 emission factor for fuel *i*
Data unit	t CO_2 / TJ
Equations referred	Equation (2), (9), (18), (27), (36)
Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied	Fuelwood: 112 Artisanal charcoal: 89
Source of data	☐ Measured ☒ Other sources

Choice of data or measurement methods and procedures	The wood value is derived from the 2006 IPCC Guidelines for National GHG Inventories, Chapter 2, Table 2.5 default emission factor values for CO_2 The charcoal value is derived from research results for artisanal charcoal combustion in traditional cookstoves summarized in Appendix 7
Treatment of uncertainty	The values represent average (fuelwood) and conservative (charcoal) estimates. The use of the fuelwood value is justified in relation to the conservativeness provisions in the definition of the benchmark baseline efficiency of fuelwood stoves
Additional comments	N/A

Data / Parameter table 5.

Data/parameter	$EF_{j,CO2}$
Description	CO_2 emission factor for fuel *j*
Data unit	t CO_2 / TJ
Equations referred	Equation (3), (11), (20), (28)
Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied	Any other fuels: Default values from the latest version of the IPCC Guidelines for National GHG Inventories. For fuels such as dung and agricultural residues, the values shall be 0
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	-
Treatment of uncertainty	See paragraph 118
Additional comments	N/A

Data / Parameter table 6.

Data/parameter:	$EF_{i,nonCO2}$
Description:	Non-CO_2 emission factor for fuel *i*
Data unit:	t CO_2eq / TJ
Equations referred:	Equation (4), (10), (19), (29)
Purpose of data:	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied:	Fuelwood: 8.635 Artisanal charcoal: 5.845
Source of data:	☐ Measured ☒ Other sources
Choice of data or measurement	The wood value is derived from the 2006 IPCC Guidelines for National GHG Inventories, Chapter 2, Table 2.5 default emission factor values for

methods and procedures:	CH_4 of 300 kg / TJ and for N_2O of 4 kg / TJ and IPCC Fifth Assessment Report (AR5) GWPs for biogenic CH_4 of 25.25 and for N_2O of 265. The charcoal value is derived from the 2006 IPCC Guidelines for National GHG Inventories, Chapter 2, Table 2.5 default emission factor values for CH4 of 200 kg / TJ and the higher bound for N_2O of 3 kg / TJ and the same AR5 GWPs as compared to research results for artisanal charcoal combustion in traditional cookstoves summarized in Appendix 7. The GWPs shall be updated according to any future CMA decisions
Treatment of uncertainty:	Wood value: The central value is average to conservative in the context of household cooking in the activity setting since the combustion setting tends toward higher emissions and the uncertainty of the average value -33 per cent to +300 per cent. Charcoal value: The values are average to conservative in the context of household cooking in the activity setting since the combustion setting tends toward higher emissions. In particular, the N_2O emissions level derived from research results for artisanal charcoal combustion in traditional cookstoves and summarized in Appendix 7 is 250 per cent of the default IPCC upper bound value applied here
Additional comments:	N/A

Data / Parameter table 7.

Data/parameter:	$EF_{j,nonCO2}$
Description:	Non-CO_2 emission factor for fuel *j*
Data unit:	t CO_2eq / TJ
Equations referred:	Equation (5), (12), (21), (30)
Purpose of data:	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied:	Default values from the latest version of the IPCC Guidelines for National GHG Inventories
Source of data:	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures:	IPCC Fifth Assessment Report (AR5) GWPs for biogenic CH_4 of 25.25 and for N_2O of 265. The GWPs shall be updated according to any future CMA decisions
Treatment of uncertainty:	Central values shall be used
Additional comments:	N/A

Data / Parameter table 8.

Data/parameter	$EF_{i,CO2,upstream}$
Description	CO_2 upstream emission factor for fuel *i*
Data unit	t CO_2 / TJ
Equations referred	Equation (2), (9), (18), (27), (36)

Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied	Fuelwood: 0 Charcoal: 98
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	The charcoal value is derived from research results for artisanal charcoal production in earth mound kilns summarized in Appendix 7
Treatment of uncertainty	The value for charcoal is conservative since it reflects a wood-to-charcoal ratio of 5:1 whereas measured ratios in field operations are consistently higher than this as described further in Appendix 7
Additional comments	Upstream emissions for fuelwood are considered to be zero

Data / Parameter table 9.

Data/parameter	$EF_{i,nonCO2,upstream}$
Description	Non-CO_2 upstream emission factor for fuel *i*
Data unit	t CO_2eq / TJ
Equations referred	Equation (4), (10), (19), (29)
Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied	Fuelwood: 0 Charcoal: 59.312
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	The charcoal value is derived from research results for artisanal charcoal production in earth mound kilns summarized in Appendix 7
Treatment of uncertainty	The value for charcoal is conservative since it reflects a wood-to-charcoal ratio of 5:1 whereas measured ratios in field operations are consistently higher than this as described further in Appendix 7
Additional comments	Upstream emissions for fuelwood are considered as zero

Data / Parameter table 10.

Data/parameter	$fNRB_{i,y}$
Description	Fraction of non-renewable woody biomass fuel *i* during year *y*
Data unit	per cent
Equations referred	Equation (2), (9), (18), (27), (36)
Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied	As per the fNRB tool

Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	Select a multi-national, national, or sub-national parameter from the fNRB tool for each biomass fuel *i*, based on the requirements of paragraph 23
Treatment of uncertainty	Note that it is ±30 per cent of the fNRB value at the 95 per cent confidence interval, for informational purposes
Additional comments	Updated at crediting period renewal

Data / Parameter table 11.

Data/parameter	NCV_i
Description	Net calorific value of fuel *i*
Data unit	TJ / tonnes
Equations referred	Equation (25)
Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value(s) applied	Fuelwood: 0.0156. Artisanal charcoal: 0.0295. Any other fuels: Default values from the latest version of the IPCC Guidelines for National GHG Inventories, unless otherwise specified
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement methods and procedures	The wood and charcoal values are derived from the 2006 IPCC Guidelines for National GHG Inventories, Chapter 1, Table 1.2 NCV values
Treatment of uncertainty:	The central value for wood represents average to conservative estimates. The central value for charcoal likely represents average estimates and its use is justified in relation to the conservativeness provisions in the definition of the baseline efficiency. See Appendix 7
Additional comments:	N/A

Data / Parameter table 12.

Data/parameter	$BM_{BL,i,y}$		
Description	Energy consumption of baseline fuel *i* for Article 6.4 activities in year *y*		
Data unit	TJ / (person x year)		
Equations referred	Equation (6)		
Purpose of data	☒ Baseline Scenario ☐ Activity Scenario ☐ Leakage		
Value(s) applied	**Benchmark**	**Fuel type**	
		Fuelwood	**Charcoal**

<table>
<tr><td></td><td><table><tr><td>Ambitious benchmark (activity specific)</td><td>(activity specific)</td><td>(activity specific)</td></tr></table></td></tr>
<tr><td>Source of data</td><td>☐ Measured ☒ Other sources</td></tr>
<tr><td>Choice of data or measurement methods and procedures</td><td>This parameter shall be updated at the beginning of each crediting period, or after five years from the start date of the crediting period, whichever comes first</td></tr>
<tr><td>Treatment of uncertainty</td><td>Uncertainty is managed by providing backstop values for benchmark efficiency of:
• 16.6 per cent, for a total energy consumption of fuelwood of 0.0076 TJ / (person x year), equivalent to 0.49 tonnes / (person x year) for fuelwood; and
• 27.4 per cent, at a total energy consumption of charcoal of 0.0040 TJ / (person x year), equivalent to 0.135 tonnes / (person x year) for charcoal</td></tr>
<tr><td>Additional comments</td><td>N/A</td></tr>
</table>

Data / Parameter table 13.

<table>
<tr><td>Data/parameter</td><td>$BM_{BL,j,UNC,y}$</td></tr>
<tr><td>Description</td><td>Energy consumption of baseline fuel j for Article 6.4 activities taken from conservative BAU based on uncertainty in year y</td></tr>
<tr><td>Data unit</td><td>TJ / (person x year)</td></tr>
<tr><td>Equations referred</td><td>Equation (22)</td></tr>
<tr><td>Purpose of data</td><td>☒ Baseline Scenario ☐ Activity Scenario ☐ Leakage</td></tr>
<tr><td>Value(s) applied</td><td><table><tr><td rowspan="2">Benchmark</td><td colspan="2">Fuel type</td></tr><tr><td>Fuelwood</td><td>Charcoal</td></tr><tr><td>Conservative BAU (methodology default)</td><td>0.0098</td><td>0.0044</td></tr></table></td></tr>
<tr><td>Source of data</td><td>☐ Measured ☒ Other sources</td></tr>
<tr><td>Choice of data or measurement methods and procedures</td><td>A default value from this mechanism methodology.
This parameter shall be updated at the beginning of each crediting period, or after five years from the start date of the crediting period, whichever comes first</td></tr>
<tr><td>Treatment of uncertainty</td><td>The values represent conservative estimates of average performance in the context of this mechanism methodology’s eligibility, based on conservative BAU efficiency of:
• 13.0 per cent, for a total energy consumption of fuelwood of 0.0098 TJ / (person x year), equivalent to 0.63 tonnes / (person x year) for fuelwood; and
• 25.0 per cent, at a total energy consumption of charcoal of 0.0044 TJ / (person x year), equivalent to 0.15 tonnes/ (person x year) for charcoal</td></tr>
<tr><td>Additional comments</td><td>N/A</td></tr>
</table>

16. Data and parameters monitored

Data / Parameter table 14.

Data/parameter	$Days_{y,h}$	
Description	Number of total possible project cookstove days during the year *y* in household *h*	
Data unit	Number	
Equations referred	Equation (7), (22), (23)	
Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Value applied		
Measurement methods and procedures	For each Article 6.4 activity household *h*, this shall be maintained in a database based on all days covered by the monitoring period since the date on which the project cookstove was obtained by the household. For example, if the monitoring period starts on 1 January 2026 and ends on 31 December 2026 and the household received the cookstove on 1 April, then this parameter corresponds to 275 days. If the household already received the project cookstove in the previous monitoring period, this parameter corresponds to 365 days for that monitoring period	
Measurement and updating frequency	Annually	
Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
Measurement intervals	Annual	
QA/QC procedures	Ongoing maintenance of total sales and service records and activity databases shall be undertaken	
Treatment of uncertainty	Not applicable	
Additional comment	-	

Data / Parameter table 15.

Data/parameter	H_y
Description	Average household size in year *y*

Data unit	Number of persons per household, regardless of age or gender	
Equations referred	Equation (22), (23), (31), (32)	
Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Value applied		
Measurement methods and procedures	Pre-activity survey and annual usage surveys, with the lower value applied where a decrease in household size is observed	
Measurement and updating frequency	Annually (ex-ante via the pre-activity survey and annually via usage surveys)	
Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
Measurement intervals	Annually	
QA/QC procedures	The parameter estimate from the survey shall meet the minimum reliability of 95/10 to use the mean value	
Treatment of uncertainty	If the target reliability is not met, the activity participant shall apply the lower bound of the confidence interval as the parameter value	
Additional comment	-	

Data / Parameter table 16.

Data/parameter	$FEC_{proj,i,y}$
Description	Energy consumption of fuel *i* as measured by the activity KPTs in year *y*
Data unit	TJ / (person x year)
Equations referred	Equation (31)
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value applied	
Measurement methods and procedures	Representative sample using the KPT in compliance with the sampling and surveys tool and the requirements in Appendix 4
Measurement and updating frequency	At least every two years

Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	In compliance with the valid KPT protocol
	Accuracy class	In compliance with the valid KPT protocol
	Calibration requirements	In compliance with the valid KPT protocol
	Location	Article 6.4 activity households
Measurement intervals	N/A	
QA/QC procedures	The study shall meet the minimum reliability of 95/10 for the target parameter of average annual energy consumption per person. The 95/10 rule is applied to the sum of energy consumption across each fuel. Activity participants should apply the guidance in Appendix 6	
Treatment of uncertainty	If the target reliability is not met, the activity participant shall take the upper bound of the confidence interval as the parameter value, proportionately applied across all of the fuels used	
Additional comment	-	

Data / Parameter table 17.

Data/parameter	$FEC_{proj,j,y}$	
Description	Energy consumption of secondary fuel *j* as measured by the activity KPTs in year *y*	
Data unit	TJ / (person x year)	
Equations referred	Equation (32)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Value applied		
Measurement methods and procedures	Representative sample using the KPT in compliance with the sampling and surveys tool and the requirements in Appendix 4	
Measurement and updating frequency	At least every two years	
Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	In compliance with the valid KPT protocol
	Accuracy class	In compliance with the valid KPT protocol
	Calibration requirements	In compliance with the valid KPT protocol
	Location	Article 6.4 activity households

Measurement intervals	N/A
QA/QC procedures	The study shall meet the minimum reliability of 95/10 for the target parameter of average annual energy consumption per person. The 95/10 rule is applied to the sum of energy consumption across each fuel. Activity participants should apply the guidance in Appendix 6
Treatment of uncertainty	If the target reliability is not met, the activity participant shall take the upper bound of the confidence interval as the parameter value, proportionately applied across all of the fuels used
Additional comment	-

Data / Parameter table 18.

Data/parameter	$PC_{b,i}$	
Description	Proportion of pre-activity cooking events conducted using fuel *i*	
Data unit	Percentage	
Equations referred	N/A	
Purpose of data	☐ Baseline Scenario ☐ Activity Scenario ☐ Leakage	
Value applied		
Measurement methods and procedures	Pre-activity surveys. The survey shall identify all the cooking devices present in the household. For each cooking device present in the household, respondents shall be asked "How many times did you cook using (*specify cooking device*) yesterday?" to determine the number of usage events per day per device. Estimate the proportion of cooking events conducted using fuel *i*, and use the result in conjunction with parameter $PC_{p,j}$ to identify any material difference between the baseline scenario and actual Article 6.4 activity households. This parameter does not appear in emissions reduction quantification equations	
Measurement and updating frequency	Once per crediting period	
Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	Article 6.4 activity households
Measurement intervals	Once	

QA/QC procedures	The parameter estimate from the survey shall meet the minimum reliability of 95/10 for the percentage of baseline cooking conducted using fuel *i*,
Treatment of uncertainty	N/A
Additional comment	This parameter is used to verify that fuel switch does not occur during the Article 6.4 activity

Data / Parameter table 19.

Data/parameter	$PC_{p,i}$	
Description	Proportion of cooking events conducted using fuel *i* during the Article 6.4 activity	
Data unit	Percentage	
Equations referred	N/A	
Purpose of data	☐ Baseline Scenario ☐ Activity Scenario ☐ Leakage	
Value applied		
Measurement methods and procedures	Activity usage surveys. The first activity usage survey must ask to identify all the cooking devices present in the household. For the project cookstove and each other cooking device present in the household, ask "How many times did you cook using (cooking device) yesterday?" to determine the number of usage events per day per device. Estimate the proportion of activity cooking events conducted using fuel *i*, and use the result in conjunction with parameter $PC_{b,i}$ to identify any material difference between the baseline scenario and actual Article 6.4 activity households. This parameter does not appear in emissions reduction quantification equations	
Measurement and updating frequency	Once per crediting period	
Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	Article 6.4 activity households
Measurement intervals	Once	
QA/QC procedures	The parameter estimate from the survey shall meet the minimum reliability of 95/10 for the percentage of activity cooking conducted using fuel *i*	

Treatment of uncertainty	N/A
Additional comment	This parameter is used to verify that fuel switch does not occur during the Article 6.4 activity

Data / Parameter table 20.

Data/parameter	PCE_m	
Description	Average project cookstove cooking events per day over one month from SUMs measurements	
Data unit	Number of cooking events/day	
Equations referred	Equation (34)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Value applied		
Measurement methods and procedures	Installation of SUMs on a representative sample of project cookstoves that are the same on which the KPT is performed	
Measurement and updating frequency	SUMs monitoring. Continuously during a contiguous one-month duration during the first monitoring period of the crediting period	
Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	SUMs
	Accuracy class	In compliance with Appendix 6
	Calibration requirements	In compliance with Appendix 6
	Location	Article 6.4 activity households
Measurement intervals	In compliance with Appendix 6	
QA/QC procedures	The study shall meet the minimum reliability of 95/10 for the target parameter of average cooking events per day per project cookstoves. In compliance with Appendix 6	
Treatment of uncertainty	If the target reliability is not met, the activity participant shall take the lower bound of the confidence intervals as the parameter value	
Additional comment	Households in the SUMs sample shall not receive any support different from or additional to those not in the sample	

Data / Parameter table 21.

Data/parameter	PCE_{KPT}
Description	Average project cookstove cooking events per day over the activity KPTs from SUMs measurements
Data unit	Number of cooking events/day

Equations referred	Equation (34)	
Purpose of data	☐ Baseline Scenario ☒ Activity Scenario ☐ Leakage	
Value applied		
Measurement methods and procedures	SUMs monitoring. Installation of SUMs on the project cookstoves during the activity KPT	
Measurement and updating frequency	Continuously for the duration of the first Article 6.4 activity KPTs	
Entity/person responsible for the measurement	Activity participants	
Measuring instrument(s)	*Type of instrument*	SUMs
	Accuracy class	In compliance with Appendix 6
	Calibration requirements	In compliance with Appendix 6
	Location	Article 6.4 activity households
Measurement intervals	In compliance with Appendix 6	
QA/QC procedures	The study shall meet the minimum reliability of 95/10 for the target parameter of average cooking events per day per project cookstoves. In compliance with Appendix 6	
Treatment of uncertainty	If the target reliability is not met, the activity participant shall take the lower bound of the confidence intervals as the parameter value	
Additional comment	Households in the SUMs sample shall not receive any support different from or additional to those not in the sample	

Data / Parameter table 22.

Data/parameter	Ψ_y
Description	Percent of A6.4 activity households that qualify as user households in year *y*
Data unit	Percentage
Equations referred	Equations (6), (7), (22), (23), (31), (32)
Purpose of data	☒ Baseline Scenario ☒ Activity Scenario ☐ Leakage
Value applied	
Measurement methods and procedures	Household surveys of households participating in the Article 6.4 activity with cookstoves present, where respondents are asked whether the cookstove is used more than five times per week. The project cookstove shall also be visually observed to identify and report on the following signs of consistent use. Project cookstove is: 1. Unpacked 2. Present in an easily accessible area

	3. Not being used for a non-cooking purpose 4. In apparent working condition 5. Not showing signs of disuse (e.g., dust accumulation or spider webs) 6. Showing evidence of recent use (e.g., presence of recent ashes). The requirements of the sampling and surveys tool shall be applied along with the complementary requirements in Appendix 4 and Appendix 6. When surveys only are used to estimate Ψ_y, the values shall be capped at 90 per cent for Article 6.4 activities that undertake customer support actions as described below and at 58 per cent for those that do not. When the percentage is measured using SUMs on a sample of Article 6.4 activity households. The requirements of the sampling and survey tool shall be applied along with the complementary requirements in Appendix 4 and Appendix 6. The results shall be processed such that each A6.4 activity household that uses the project cookstove at least once five times per week (or the minimum frequency defined for the A6.4 activity) is assigned a score of "1" and each A6.4 activity household that does not is assigned a score of "0". The percentage is calculated at the sum of the scores "1" and "0" divided by the total number of A6.4 activity households sampled	
Measurement and updating frequency	Annual	
Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	N/A or SUMs
	Accuracy class	When SUMs, in compliance with Appendix 6
	Calibration requirements	When SUMS, in compliance with Appendix 6
	Location	Article 6.4 activity households
Measurement intervals	When SUMS, in compliance with Appendix 6	
QA/QC procedures	Option 1*:* Sampling shall be conducted to meet the 95/10 reliability guideline on the target parameter of the percentage of Article 6.4 activity households with cookstoves present in which project cookstove is used at least once per week (or the minimum frequency defined for the A6.4 activity). Option 2: Sampling for the measurements using SUMs shall be conducted to meet the 95/10 reliability guideline on the target parameter of the percentage of Article 6.4 activity households with cookstoves present in which project cookstove is used at least once per week (or the minimum frequency defined for the A6.4 activity). The results based on the SUMs measurements shall be cross-checked against the survey results to confirm the presence of the project cookstove and SUM and support interpretation of usage data	
Treatment of uncertainty	The lower bound of the confidence interval is applied as the parameter value	
Additional comment	N/A	

Data / Parameter table 23.

Data / Parameter	$AC_{New,y}$	
Description	Quantity of new project cookstoves added to the activity in year *y*	
Data unit	Number	
Equations referred	Equation (35)	
Purpose of data	☐ Baseline Scenario ☐ Activity Scenario ☒ Leakage	
Value applied		
Measurement methods and procedures	It is the count of new project cookstoves that are included in the Article 6.4 activity database during a year	
Measurement and updating frequency	Annual	
Entity/person responsible for the measurement	Activity participant	
Measuring instrument(s)	*Type of instrument*	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
Measurement intervals	Annual	
QA/QC procedures	Cross check against household number and waiver certificates or similar	
Treatment of uncertainty	Not applicable	
Additional comment	-	

Appendix 1. Activity information cover sheet

1. To be completed at the activity design stage (validation) and updated at time of each verification (highlighting changes from the most recent version).

2. Essential activity information:

   (a) Start date of the crediting period;

   (b) Crediting period end date;

   (c) Article 6.4 activity fuel type(s);

   (d) Project cookstove(s) type(s), model(s) used in the Article 6.4 activity;

   (e) ISO thermal efficiency(ies) of cookstoves used in the Article 6.4 activity;[1]

   (f) ISO tier(s) for PM2.5 emissions (optional);[1]

   (g) ISO tier(s) for CO emissions (optional);[1]

   (h) Number of households;

   (i) Average household size (persons per household, regardless of age or gender);

   (j) Number of project cookstoves of each type distributed during the crediting period;

   (k) Geographical boundary (stoves);

   (l) Geographical boundary (fuel);

   (m) Expected (ex-ante) or achieved (ex-post) gross CO_2e emission reductions (per household);

   (n) Calculation sheet publicly available? (Y/N).

3. Emissions reduction information:

   (a) Primary fuel type(s) identified in the pre-activity scenario;

   (b) Secondary fuel type(s) identified in the pre-activity scenario;

   (c) Baseline fuel consumption approach (e.g., default);

   (d) Baseline fuel consumption value;

   (e) Article 6.4 activity stove usage monitoring approach (Survey or SUMs+Survey);

   (f) Third party used for Usage survey? (Y/N);

   (g) Number of households sampled for SUMs (for usage);

   (h) Article 6.4 activity monitoring approach (KPT or KPT+SUMs);

[1] Where ISO 19867 (or equivalent national standards) is used to determine thermal efficiency, CO, or PM tiers, the corresponding carbon balance shall be reported.

(i) Third party used for KPTs? (Y/N);

(j) Number of households sampled for KPT;

(k) Number of households sampled for SUMs (for Hawthorne effect);

(l) fNRB value;

(m) Geographical boundary used to determine the fNRB value;

(n) Details on customer support activities provided:

(i) Demonstration that the Article 6.4 activity has selected technologies and fuels that meet the cooking needs of the target population;

(ii) Activity participant operations and maintenance support activities;

(iii) Availability and use of support communication channels to households participating in the Article 6.4 activity.

4. How seasonality is addressed in the Article 6.4 activity monitoring plan:

(a) Justification for how this approach will result in accurate Article 6.4 activity emission reduction calculations;

(b) If space heating is common in the Article 6.4 activity area, how space heating has been addressed in the Article 6.4 activity design.

5. Description of any missing and outlier or excluded data for KPTs, SUMs, surveys.

6. Description of how sampling randomization was conducted and what proof is available to auditors.

7. SUMs validation checks performed (as described in Appendix 6, for Article 6.4 activities using SUMs).

8. Compliance with the Principles[2] for Responsible Carbon Finance in Clean Cooking (optional).

[2] See https://cleancooking.org/wp-content/uploads/2024/05/The-Principles-for-Responsible-Carbon-Finance-in-Clean-Cooking.pdf.

Appendix 2. Sample template for the A6.4ERs waiver certificate

1. Scope and Application

1. This appendix provides a template, requirements and guidance for the application of A6.4ERs waiver certificates.

2. The activity participant may obtain a A6.4ERs waiver certificate from each household in which a project cookstove is distributed as part of the activity.

3. When utilized, the contents of the A6.4ERs waiver certificate and the implication of the A6.4ERs waiver certificate shall be clearly communicated to the user and shall denote that the A6.4ERs Waiver Certificate is obtained with consent of the household.

4. When utilized, the A6.4ERs waiver certificate shall be signed by the head of the household, or a named delegated adult (typically spouse/partner) with documented authority (defined as per the national regulations).

5. The contents of the certificate, the meaning of A6.4ERs, and the implications of its execution shall be verbally explained to the signatory in their language prior to attestation. This verbal explanation shall be audio-recorded and archived as part of the documentation.

6. This appendix provides an example A6.4ERs waiver certificate to be used by the activity participant. The A6.4ERs waiver certificate shall be available in each language commonly spoken in the activity boundary. Where the head of household or adult resident is unable to read or write, attestation may be provided by (i) a thumbprint witnessed by both the enumerator and a community witness independent of the activity; (ii) an audio-recorded oral consent in the relevant local language; or (iii) a digital signature captured via biometric device. The contents of the certificate and the implications of its execution shall be verbally explained to the signatory in their language prior to attestation, and this verbal explanation shall itself be audio-recorded and archived as part of the documentation.

7. Personal data about the household and the user such as contact information and national identification number shall not be made public but shall be made available to the DOE during validation and verification, as relevant.

2. A6.4ERs waiver certificate

2.1. Household Data

8. Full Name of the Household representative.

9. Contact Number, if any.

10. Email address, if any.

11. Address:

    (a) Country;

(b) State;

(c) District;

(d) Village;

(e) Street;

(f) Local Landmark;

(g) House number;

12. National Identification Number or any Government issued ID (and evidence of number).

2.2. Details of the Project Cookstoves

13. Type of Stove.

14. Fuel Type.

15. Manufacturer.

16. Vendor or Distributor.

17. Certified Efficiency.

18. Unique Identification Number.

19. Manufacturing series.

20. Installation Date.

3. A6.4ERs waiver certificate statement

21. I, the undersigned, confirm my participation in the Article 6.4 activity (Name of the activity, Reference ID) by receiving the above-mentioned stove for the primary purposes of cooking meals, preparing beverages or heating water. I received the cookstove (free of charge) OR (at the cost of ______).

22. By signing this waiver, I voluntarily and with full knowledge and consent pass on my rights to A6.4ERs (carbon credits) to the activity participant [name of the proponent].

23. By signing this waiver, I voluntarily and with full knowledge and consent agree not to claim A6.4ERs (carbon credits) from any other carbon crediting programme related to the use of the above-mentioned stove.

24. By signing this waiver, I confirm my intention to adhere to any and all relevant rules, requirements and procedures established for the Article 6.4 activity and its methodologies, tools, and standards.

25. I confirm that I have read and understood the contents of this waiver and its contents have been explained adequately and appropriately by the activity participant.

26. Signature Date (DD/MM/YYYY)

Appendix 3. Activity-specific survey requirements for energy efficiency measures in household cooking

1. Scope and Application

1. This appendix specifies activity-specific survey requirements for the design and implementation of surveys for efficient cooking activities under this mechanism methodology.

2. General requirements for surveys, including data collection and quality assurance/quality control (QA/QC), as well as requirements for sampling design, sample size determination, and reliability, shall be applied in accordance with the “Methodological tool: Sampling and surveys” (A6.4-AMT-0XX) [1].

3. The provisions in this appendix supplement the “Methodological tool: Sampling and surveys” by providing:

    (a) Survey types and their objectives;

    (b) Key parameters to be assessed; and

    (c) Activity-specific data collection and verification procedures.

4. Requirements and guidance for selecting samples of appropriate size and representativeness can be found in Appendix 4.

2. General survey requirements

2.1. Survey Administration

5. Surveys shall be conducted by trained enumerators in accordance with the sampling plan and QA/QC procedures. Enumerators shall be independent of the activity participant’s organization. Where applicable, the independence of the entity shall be demonstrated through a signed conflict of interest form in which all conflicts are disclosed (including relational, financial, competitive, and others). At a minimum, enumerators shall not be engaged in a customer-facing role for the activity participant or its implementation partners, such as selling, marketing, distributing, or providing customer service for project cookstoves.

6. Data collection shall be carried out using methods that ensure accuracy, consistency and traceability. Where feasible, surveys shall be conducted using electronic data collection systems with built-in validation checks.

[1] This draft methodological tool is still under development and is yet to be approved by the supervisory Body. The draft methodology will be revised accordingly if changes to this draft version of this methodological tool are made by the time of their adoption.

2.2. Respondent selection and consent

7. Surveys should be conducted with the main household cook, who must give her informed consent prior to the start of the interview. Consent shall be documented as part of the survey record.

8. Where the main cook is unavailable, the interview may be conducted with another knowledgeable household member, provided that reasonable efforts are made to validate responses. Where the main cook is a dependent child, both the child and their guardian shall provide consent and be present.

2.3. Language and cultural considerations

9. Surveys shall be conducted in a language understood by the respondent. Where the enumerators do not speak the local language fluently, a qualified interpreter shall be used in the exercise.

10. Surveys should be as concise as possible. Enumerators shall provide a realistic estimate of the time needed to complete the survey.

11. The survey implementation shall respect applicable national regulations, as well as local customs and practices. Hence, before conducting surveys, the activity participants shall ensure that relevant local authorities and community leaders have been consulted.

12. Survey instruments shall be designed to minimize respondent burden and reduce bias. Where retrospective information is required, questions should refer to recent and specific time periods (e.g. "yesterday") to improve recall accuracy. This approach has been shown to be more accurate than asking interviewees to aggregate or approximate their activities over a longer period of time, such as "last week."

2.4. Definition of cooking events

13. For the purposes of this methodology, a *cooking event* refers to any instance in which useful energy is delivered from a cookstove to perform a discrete task or set of tasks (e.g. cooking a meal, preparing beverages, or heating water).

14. Survey instruments shall ensure that all relevant cooking events are captured consistently across respondents.

2.5. Additional guidance on survey design and implementation:

15. Additional general guidance on conducting high-quality surveys in the low- and middle-income country (LMIC) context can be found in the following documents:

    (a) Household Sample Surveys in Developing and Transition Countries;

    (b) Designing Household Survey Samples: Practical Guidelines;

    (c) Siwatu,Gbemisola Oseni; Palacios-Lopez,Amparo; Mugera,Harriet Kasidi; Durazo,Josefine. *Capturing What Matters: Essential Guidelines for Designing Household Surveys (English).* LSMS Guidebook Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/381751639456530686.

16. Specific survey guidance and tested questions relating to various aspects of household energy patterns and transitions, including cooking carbon projects, can be found in the following resources:

    (a) Guidance on survey design from the authors of Gill-Wiehl, A., Kammen, D.M. & Haya, B.K. Pervasive over-crediting from cookstove offset methodologies. Nat Sustain 7, 191–202 (2024). https://doi.org/10.1038/s41893-023-01259-6;

    (b) Clean Cooking Alliance's Fuel Stacking Toolkit.

3. Pre-activity survey

3.1. Purpose:

17. The pre-activity survey shall be conducted to:

    (a) Establish the household size (number of persons per household);

    (b) Identify cooking fuels and technologies used;

    (c) Quantify the proportion of cooking events associated with each fuel-technology combination; and

    (d) Assess whether space heating affects fuel consumption, where relevant.

3.2. Application of results

18. The results of the pre-activity survey shall be used to inform the design of the monitoring approach, including the treatment of seasonal variation and any additional uses of fuel (e.g. space heating).

19. Where significant variation is identified, activity participants shall demonstrate how such variation is accounted for in the monitoring plan or apply conservative assumptions, as appropriate.

20. Activity participants shall justify, in the activity information cover Sheet, how the selected approach ensures accurate estimation of activity fuel use.

21. If space heating is common in the activity area, the justification must include an explanation of how space heating has been addressed in the activity design to focus the activity quantification on cooking. Where an accurate approach cannot be taken, then the activity participants must instead select and justify a conservative approach.

3.3. Examples of common cookstove types

22. To support consistent identification and classification of baseline technologies during surveys, the following non-exhaustive list of commonly observed cookstove types is provided.

3.3.1. Wood-based cookstoves

23. Three-stone fire:

    (a) A setup using three stones or bricks arranged in a triangular shape to support a cooking pot, with an open fire in the centre; and

(b) Materials: natural stones, bricks, or compacted earth.

24. Sunken pit cookstove:

(a) A shallow pit dug into the ground where wood is burned; and

(b) Materials: bare earth or reinforced with clay.

25. U-shaped mud cookstove:

(a) A simple mud or clay structure in a U-shape, designed to hold a pot over an open fire; and

(b) Materials: locally sourced mud or clay, sometimes reinforced with straw.

26. Traditional chulha/chulho:

(a) A raised, built-in clay or brick cookstove with one or more burner holes for pots;

(b) Materials: clay, bricks, or mud, sometimes with cow dung.

27. Plancha cookstove (traditional):

(a) A raised clay or metal cookstove with a flat griddle (plancha) for cooking tortillas or flatbreads;

(b) Materials: clay, bricks, metal griddle.

3.3.2. Charcoal-based cookstoves

28. Metal bucket cookstove:

(a) A metal bucket or shallow metal bowl with ventilation holes at the bottom and a top grate for placing charcoal;

(b) Materials: sheet metal, iron, steel.

29. Ceramic-lined charcoal cookstove:

(a) A metal bucket cookstove with a ceramic liner inside for heat retention and insulation;

(b) Materials: sheet metal exterior with a ceramic inner lining.

30. Clay pot Cookstove:

(a) A clay vessel with an opening for airflow and a flat surface for a cooking pot;

(b) Materials: fired clay or terracotta.

4. Activity kitchen performance test (KPT) surveys (simultaneous to KPTs)

4.1. Purpose:

31. Surveys conducted in conjunction with kitchen performance tests (KPTs) shall be used to

(a) Determine, per cooking event, the number of people for whom cooking was performed; and

(b) document any unusual cooking practices that may influence energy consumption.

5. Usage survey

5.1. Purpose

32. Usage surveys shall be conducted to:

(a) Determine whether the activity cookstove is present and in use within the household;

(b) Assess the frequency of use of the activity cookstove to determine if the household may be counted as a user household;

(c) identify any seasonal or other variations that may affect the project cookstove usage patterns and hence affect the project's emission reductions.

33. Where stove use monitors (SUMs) are applied, surveys shall still be conducted to confirm the presence of the technology and support interpretation of usage data.

5.2. Visual verification requirements

34. Results from the usage survey shall be corroborated through visual inspection using a standardized checklist to assess if the activity technology is present in the kitchen and shows evidence of recent use.

35. Enumerators shall capture digital images of all cookstoves present in the household, as well as the associated cooking area(s), using data collection devices capable of automatically recording the geolocation (e.g. GNSS/GPS), timestamp, and device metadata. The photographs must include both close-ups of each technology and its fuel (if present) and wider-angle images showing the position of the cookstoves within or in proximity to the household.

36. All images shall be geotagged and time-stamped at the point of capture. Where connectivity is limited, metadata shall be stored locally and synchronized upon data upload. The data collection system shall include validation checks (e.g. mandatory fields, metadata completeness, and duplicate detection) to ensure data integrity.

5.3. Supplemental purpose of first usage survey administered in any given household

37. This supplemental usage survey activity is used to check how well the activity household characteristics match the ex-ante baseline scenario. Retrospective questions are added to the first usage survey conducted in any given household. To the extent possible, these retrospective questions should be identical to the questions in the pre-activity survey, just asked retrospectively. Activity participants shall identify any mismatch between the primary fuel type and household size documented during the pre-activity survey and those reported by actual activity households during the activity roll-out.

38. Therefore, the first usage survey administered in any given household shall additionally serve to:

(a) Establish household size;

(b) Identify cooking fuels and technologies used prior to acquisition of project cookstove (retrospective baseline);

(c) Document the proportion of cooking events carried out on each fuel-technology combination used prior to acquisition of project cookstove (retrospective cross-check of baseline).

Appendix 4. Activity-specific sampling provisions for energy efficiency measures in household cooking

1. Scope and application

1. This appendix specifies activity-specific provisions for the application of sampling in activities under this mechanism methodology.

2. General requirements for sampling design, sample size determination, reliability, data collection, and quality assurance/quality control (QA/QC) shall be applied in accordance with the "Methodological tool: Sampling and surveys" (A6.4-AMT-0XX).[1]

3. The appendix supplements the tool by defining: the parameters requiring sampling under this methodology; activity-specific stratification requirements; and provisions for the use and integration of data sources, including surveys, kitchen performance tests (KPTs), and stove use monitors (SUMs).

2. Parameters requiring sampling

4. Sampling shall be applied to parameters identified in this methodology where direct measurement of the full population is not feasible. Parameters expected to be sampled are listed in Table 1.

5. Activity participants shall ensure that:

   (a) each parameter is clearly defined and linked to an appropriate data source (e.g. surveys, KPTs, SUMs);

   (b) sampling approaches are applied consistently across parameters where feasible;

   (c) cluster sampling shall not be applied; and

   (d) the required reliability levels are achieved for each parameter, in accordance with the sampling and surveys tool.[1]

6. Where multiple parameters are estimated using a single sampling effort, activity participants shall demonstrate that the sampling design is appropriate for all parameters and meets the required reliability for each.

[1] This draft methodological tool is still under development and is yet to be approved by the supervisory Body. The draft methodology will be revised accordingly if changes to this draft version of this methodological tool is made by the time of their adoption.

Table 1. Parameters requiring sampling and applicable data sources

Parameter	Description	Unit	Data source	Rule and guidance	Reference section for guidance
H_y	Average household size	Number of persons per household (Number)	Pre-activity survey and Usage surveys	95/10	Continuous distribution
$FEC_{proj,i,y}$ and $FEC_{proj,j,y}$	Total energy consumption of activity fuels (*i* and *j*) in activity	TJ / (person x year)	Activity KPTs	95/10	Continuous distribution
$PC_{b,i}$	Proportion of pre-activity cooking events conducted using fuel *i*	Percent	Pre-activity survey	95/10	Proportional distribution
$PC_{p,i}$	Proportion of cooking events conducted using fuel *i* during the Article 6.4 activity	Percent	Usage survey	95/10	Proportional distribution
PCE_m	Average project cookstove cooking events per day over 1 month from SUMs measurements	Cooking events/day	SUMs	95/10	Continuous distribution
PCE_{KPT}	Average project cookstove cooking events per day over the project KPT from SUMs measurements	Cooking events/day	SUMs	95/10	Continuous distribution
Ψ_y	Percent of activity households that qualify as user households in year y	Percentage	Usage survey or SUMs	95/10	Proportional distribution

3. Selection of the sampling approach

7. Activity participants may apply appropriate probability-based approaches, in accordance with the sampling and surveys tool.[2]

8. The activity participants shall document the sampling design, including the procedure used to ensure randomization in a manner that enables independent verification. Acceptable

[2] This draft methodological tool is still under development and is yet to be approved by the supervisory Body. The draft methodology will be revised accordingly if changes to this draft version of this methodological tool is made by the time of their adoption.

documentation may include a record of the random number generator or software used, screenshots of the randomization process, or signed attestations from third parties who witnessed the selection. These materials shall be maintained as part of the activity record and made available to the validation and verification body upon request.

4. Stratification requirements

9. Where stratified random sampling is applied, the sampling design shall reflect key characteristics of the population that may influence parameter values.

10. Such sampling shall be stratified by cookstove age categories, when applicable, recognizing its influence on performance, usage and operational status. The following strata shall be applied: less than 1 year, 1–2 years, 2–3 years, 3–4 years, and more than 4 years.

11. Additional stratification may be applied where relevant (e.g. geographic location, socio-economic characteristics, or technology types), in accordance with the sampling and surveys tool. [3]

5. Determination of sample size:

12. Sample size determination, including for both continuous and proportional variables, shall be conducted in accordance with the sampling and surveys tool[2]. This includes the selection of appropriate statistical parameters, treatment of variability, and application of reliability requirements.

13. Where SUMs are used, oversampling by 20 per cent of the calculated sample size shall be applied to meet the required reliability. Where field conditions are particularly challenging (remote areas, long monitoring periods, or prior SUM failure rates above 15 per cent), an oversampling of 25 per cent is recommended. This is to account for SUMs that may be defective or whose readings may be considered outliers.

14. Notwithstanding paragraphs 12 and 13, where SUMs are used for measuring usage on a sample basis, the size of the sample of cookstoves equipped with SUMs shall be set, at minimum, in accordance with Table 2 or the sample size calculated following the “Methodological tool: Sampling and surveys” (A6.4-AMT-0XX), if higher. Furthermore, the surveys that shall be conducted in parallel shall be located half at households equipped with effective/operating SUMs and half at households without SUMs, also in accordance with Table 2.

Table 2. Minimum sample size requirement for SUM-based approach

Project size	Effective SUMs	SUMs to deploy	Surveys	Number of surveys to be co-located with SUMs	Number of surveys not co-located with SUMs
Up to 2,000	340	425	120	60 co-located	60
2,000 – 20,000	390	490	150	75 co-located	75
20,000 – 100,000	405	510	180	90 co-located	90
Over 100,000	410	515	200	100 co-located	100

Appendix 5. Requirements and Best Practices for Kitchen Performance Tests (KPTs)

1. Overview

1. The KPT is a field-based methodology used to estimate household fuel consumption under real-world conditions. The KPT serves as the primary tool for assessing fuel savings needed to calculate emissions reductions.

2. This document provides requirements for how the KPT protocol shall be applied in the mechanism methodology, as well as best practice guidance for undertaking KPTs. It refers to the latest version of the KPT protocol available on the Clean Cooking Alliance (CCA) website at https://cleancooking.org/protocols. Where guidance provided here conflicts with the directives of the KPT protocol, guidance in the mechanism methodology should be followed, including the energy consumption estimates on a per capita fuel consumption basis rather than per standard adult basis.

2. Sampling requirements

3. Activities shall meet the 95/10 reliability for the total energy consumption (TJ / (person x year)) for each fuel from the activity KPTs or use the conservative 95 per cent confidence bound that results in the lower emission reductions estimate.

4. For activity KPTs, households shall be selected from the group of households included in the pre-activity survey and activity usage surveys, respectively, and only from those qualifying as user households. Households are anticipated to be statistically similar to those of the larger surveys and must be within 10 per cent of the household size and proportion of cooking done with the primary fuel for the respective pre-activity and activity scenarios. If either of these conditions are not met, the activity participant shall conduct additional sampling until these conditions are met. This requirement is separate and additional to checking that the pre-activity scenario is representative of the activity scenario.

3. Measurements and sample integrity

3.1. Checks on scales for measurement of weight of fuel

5. Scales shall be checked with a certified calibration weight (5–20 kg) at least weekly during field campaigns and results of calibration checks clearly recorded to facilitate verification by designated operational entities (DOEs).

6. The scale shall be accurate within 1 per cent of the calibration mass.

7. If a scale fails a check, any data collected since the last successful check must be excluded from the analysis.

3.2. Accounting for Wood Moisture

8. Default energy conversions assume air-dried wood (~20 per cent moisture, wet basis) with a net calorific value (NCV) of 0.0156 TJ / tonne.

9. This NCV should be applied to wood quantities before making any moisture adjustments;

10. While NCV assumptions provide a standardized approach, it is best practice to measure actual moisture content, particularly to:

 (a) Identify potential outliers;

 (b) Assess seasonal variations in fuel characteristics.

4. Fuel provision

11. Because providing fuel to households can introduce substantial bias, fuel should not be provided to households for use during the KPT in most cases.

12. In situations where households normally collect their fuel (e.g., fuelwood) daily and are not able to collect and store a full day's fuel in advance, activity participants may provide fuel for the KPT under the following conditions:

 (a) The number of households that are unable to collect and store a full day's fuel in advance shall comprise more than 40 per cent of the KPT sample; otherwise, those households should simply be excluded from the sample;

 (b) Where fuel is provided, the household shall be identified as having been provided fuel;

 (c) The amount of fuel provided shall not exceed 30 MJ/(person x day) (approximately two kg/(person x day)).

13. For households that purchase the primary fuel in discrete quantities, and it is impractical to store three times the amount typically used in a day, activities shall follow the KPT protocol guidance for fuel purchases and estimate weights accordingly.

14. Alternatively, rather than providing fuel, activity participants may use fuel-weighing sensors that measure fuel consumption in real-time. This approach may be used for any KPT, regardless of household fuel constraints.

5. Data quality and outlier handling

5.1. Outliers Identification and Exclusion Criteria

15. Outliers shall be defined as data points that fall beyond 1.5 times the interquartile range[1] (IQR) from its endpoints. Outliers may only be excluded if there is a clear, documented reason for their removal. Any excluded data shall be retained along with an explanation. Acceptable reasons for exclusion are:

 (a) Data entry errors;

[1] The IQR is the range of the middle 50% of the data. The 1.5 × IQR rule is a standard approximation for outlier identification (Tukey, 1977). It flags values falling below Q1 − 1.5 × IQR or above Q3 + 1.5 × IQR, where Q1 and Q3 are the 25th and 75th percentiles respectively. This threshold is robust to the right-skewed distributions typical of household fuel consumption data, where mean-based rules would over-flag legitimate high-consumption observations. Tukey, J.W. (1977). Exploratory Data Analysis. Addison-Wesley.

(b) Documented unusual events (e.g., party, non-household members using the cookstove); or

(c) A per capita fuel consumption >175 MJ / (person x day) for any single day (equivalent to ~10kg of wood / (person x day)).

5.2. Minimum Data Requirements

16. Only households with at least three complete days of data may be included in the analysis.

17. These three days do not need to be consecutive if:

(a) Some data are missing due to measurement failures and additional visits were conducted to compensate and

(b) All data collection must occur within a two-week period.

Appendix 6. Requirements and Best Practices for use of Stove Use Monitors (SUM)

1. General

1. In the context of the methodology, activity participants may choose from two approaches to adjust energy consumption in the activity scenario for the Hawthorne effect, differentiated by application (or non-application) of stove use monitoring (SUM). When activities complement KPTs with SUMs measurements, the ratio of project cookstove usage that is "cooking events per day" measured during the KPT to project cookstove usage that is measured during the month prior to or following the KPT is used as a multiplier in the emission reduction estimate calculation (only when that value is less than one).

2. Activity participants using the SUMs method shall place SUMs on the project cookstoves for the duration of the KPT, as well as for the continuous 30 days (before, after, or any combination of before and after[1]) to serve as a reference point.

3. SUMs are used to estimate Ψ, the per cent of activity households with the project cookstove present that qualify as user households. Projects shall use the same measurement period (at a minimum) as that used for determining a potential Hawthorne effect, and the same sampling requirements for Ψ as those outlined in Appendix 4. If sampling includes activity households where KPTs are being conducted, the frequency of use estimates shall not include data from days when KPTs are occurring. For households where SUMs installation is not possible because the project cookstove is not present, these households shall be included as non-users in the estimate Ψ.

4. This appendix provides requirements and best practice guidance for using SUMs in the context of the mechanism methodology.

2. Best practice guidance for using SUMs

2.1. Installation

5. Activity participants should follow manufacturer installation requirements (if provided) for the SUMs instrumentation being used. Unless specifically indicated otherwise, placement of the device should generally follow these key guidelines:

   (a) The project cookstoves' temperature profiles during cooking events should be analysed before the field campaign to determine optimal placement;

   (b) Temperature sensors and loggers should not be placed in a location where temperatures exceed their maximum operating/sensing temperature specifications;

[1] In the case of a combination of before and after, for example, the SUM would be placed 10 days before the start of the KPT, remain during the KPT, and then remain for a further 20 days after completing the KPT.

(c) Sensor placements should provide a maximum temperature differential between ambient and cookstove temperature (without exceeding maximum operating temperature for the sensor);

(d) When possible, cookstoves and sensing units (e.g., thermocouple leads) should be kept out of direct sunlight to reduce sensors logging the radiant heat of the sun, which can be confounded with cooking;

(e) Sensor placement should be standardized as much as possible across the sample;

(f) Sensor placement should not get in the way of the pot, or obstruct or interrupt the cooking, or be located where liquids are likely to collect or boil over;

(g) Sensor placement should not interfere with participants' normal activities. Placement should also minimize risk of the sensor being accessed, moved, and/or damaged by participants, other people, or common household features, such as water, insects, or animals;

(h) Activity participants should explain to household members that the SUMs are for measuring temperature and should not be tampered with. Household members should not press buttons, move parts, or disconnect or connect the sensors to computers or power.

2.2. Cookstove temperature analysis

6. Activity participants should follow manufacturer guidelines for data analysis[2] where available. Unless specifically indicated otherwise, analysis should generally follow these key guidelines:

(a) Subtracting ambient temperature generally improves the ability to resolve a temperature response during cookstove events from normal diurnal and seasonal temperature variation;

(b) Perform validation or sense checks on the algorithms used to determine cookstove use. These can include:

(i) Having a person with expertise manually inspect at least a subset of analysed files to check that the algorithm is determining apparent cooking events as intended;

(ii) Cross-referencing observational data on cooking events with the analysed data; or

(iii) Using common sense checks with what is generally known about cooking behaviours in the region. For example, if only one cooking event per week is being estimated when it's known that people are using several kg of fuel every day, the placement or algorithm are not working properly.

[2] Of note, data analysis can be challenging for cookstoves that are frequently moved indoors and outdoors for cooking, due to solar radiation affecting heating and cooling rates, so piloting placement of temperature monitors or probes is critical for such applications.

2.3. Public presentation of stove use algorithms

7. To support transparency and reproducibility in stove use monitoring, all algorithms that are used to convert raw SUM data into cooking events shall be publicly available throughout the crediting period and until renewal of the crediting period, following the requirements below.

2.3.1. Algorithm logic description

8. Provide a clear explanation of how the algorithm detects cooking events, including:

(a) Physical parameter(s) monitored (e.g., temperature, power);

(b) Logic for identifying events (e.g., threshold crossings, sustained changes);

(c) Preprocessing steps (e.g., filtering, smoothing);

(d) Contextual adjustments (e.g., ambient corrections, diurnal patterns).

2.3.2. Formal equation or code

9. Present the algorithm as:

(a) Equations and logic rules; or

(b) Annotated code outlining the decision steps.

2.3.3. Parameter definitions and units

10. All thresholds and time-related values shall be:

(a) Listed with units (e.g., °C, seconds) ;and

(b) Applied consistently across devices and time.

2.3.4. SUM device specifications

11. These include:

(a) Manufacturer, model, and firmware version;

(b) Sampling rate and sensor types;

(c) Any known limitations affecting performance;

(d) Replacement plan.

2.3.5. Data sample publication

12. Share at least three anonymized raw data files (two weeks or more of data) for three different project cookstoves with their processed output to demonstrate algorithm performance. Data shall:

(a) Be in a usable format (e.g., CSV, JSON) ;and

(b) Include clear headers, units, and time zone information.

2.3.6. Hosting and access

13. Activity participants shall publish the algorithm and sample dataset on a stable public platform (e.g., activity website, registry, GitHub). Include the link in the Activity information cover sheet.

Figure. Example photos of SUM placement

Appendix 7. Demonstration of requirements at the level of the mechanism methodology

1. Applicability

1. The Multidimensional Poverty Index (MPI), developed by the United Nations Development Programme (UNDP)[3] and the Oxford Poverty and Human Development Initiative (OPHI)[4], measures poverty by capturing multiple deprivations across three dimensions: health, education, and living standards. In this approach, each household is assigned a deprivation score between 0 and 1 based on weighted indicators (including, inter alia, nutrition, schooling, cooking fuel, electricity, water, and sanitation). A household is classified as multidimensionally poor if its deprivation score is greater than or equal to 0.33, meaning it is deprived in at least one-third of the weighted indicators. At the population level, MPI = H × A, where H is the proportion of people who are poor (who live in a household with deprivation score of ≥ 0.33) and A is the average intensity of their deprivations (average deprivation score of only the population living in households scoring ≥ 0.33). Although the global MPI does not define a formal population-level threshold, values of 0.20 or higher are widely associated with substantial multidimensional poverty in empirical applications and is therefore used as a reasonable benchmark for identifying areas with significant deprivation. For example, H = 0.4 (40 per cent of people considered poor) and A= 0.5 (average deprivation score of those 40 per cent people) results in the MPI of 0.2.

2. To ensure consistency, comparability, and a conservative identification of low-income populations across diverse geographic contexts, the methodology applies the World Bank poverty line expressed in purchasing power parity (PPP) terms for lower-middle income countries, e.g. US $4.20 per person per day (2021 PPP). This value is derived from the distribution of national poverty lines across countries within the same income category and represents a level of income below which households are typically unable to meet basic consumption needs. Its application provides a standardized and empirically grounded benchmark that reflects equivalent purchasing power across countries, thereby avoiding distortions arising from exchange rate differences or varying price levels. The use of this internationally recognized value ensures that activity locations are conservatively identified as low-income and supports a transparent and robust assessment of eligibility also in contexts where national or sub-national poverty metrics may not be available, comparable, or sufficiently robust. These conditions are important for ensuring the adequacy of the performance-based approach for additionality at the mechanism methodology-level.

3. The applicability conditions require that prior to the implementation of the Article 6.4 activity, the percentage of households in the target population with a functional cooking technology that is assessed to have the same or a higher efficiency as the project cookstoves is 4.5 per cent or less. While establishing this percentage, the mechanism methodology permits the activity participant to not consider the high efficiency cookstoves

[3] https://hdr.undp.org/content/2025-global-multidimensional-poverty-index-mpi#/indicies/MPI.

[4] https://ophi.org.uk/global-mpi/2025.

that are part of registered mitigation activities under other greenhouse gas (GHG) crediting programmes in the applicable geographical area. This is due to the following:

(a) There is high confidence in additionality of such activities, due to the reasoning described later in this appendix, and

(b) the quantification approaches under the other GHG crediting programmes are not relevant to fulfilling the applicability condition under this mechanism methodology.

2. Additionality

2.1. Demonstration of lock-in risks

4. The types of activity cookstoves that are expected to be distributed when applying this mechanism methodology generally have a technical lifetime of 10 years or less[5]. Therefore, activities under this mechanism methodology are not deemed to cause a lock-in risk, applying the provisions in paragraph 32 of version 01.2 of the "Standard: Demonstration of additionality in mechanism methodologies" (A6.4-STAN-METH-003) (hereinafter referred to as "additionality standard"). For informational purposes, the Article 6.4 activities are required to report the technical lifetime of the activity cookstoves, as determined based on the manufacturer's specifications and operation manuals or, in the absence of these (e.g., in the case of artisanal cookstoves), based on a third-party assessment by a certified or suitably qualified expert. These data may inform future adjustments to the analysis of lock-in risks under this mechanism methodology.

2.2. Performance-based approach

5. The related conditions of section 6.6.1 of the version 01.2 of the additionality standard are addressed as follows:

(a) In fulfilment of paragraph 61(a), this methodology uses the baseline approach referred to in paragraph 36(ii) of the rules, modalities and procedures of the Article 6.4 mechanism.

(b) In fulfilment of paragraph 61(b), the type of activity, i.e. more efficient household cooking using fuelwood or charcoal fuel in rural, low-income households, provides the service of thermal energy for cooking events for residents of the household;

(c) In fulfilment of paragraph 61(c), the performance of this type of activity can be standardized across households on the basis of thermal efficiency of the cooking technology and practices that are used for providing the thermal energy for cooking events;

(d) In fulfilment of paragraph 61(d), peer-reviewed literature[6] demonstrates that, across broad geographies, activities with a better performance have a higher likelihood of additionality, for example, improved cookstoves where the fuel is fuelwood or charcoal in low-income households in rural areas. Reports by multilateral agencies (e.g., International Energy Agency (IEA et al. 2025) and peer-reviewed literature (Stoner et al. 2021) confirm that there continues to be lack

[5] Wilson et al. 2016.

[6] Gill-Wiehl et al. 2026., Berkouwer and Dean (under review).

of access to clean cooking and dominance of solid biomass fuels in rural areas, that lack of access to clean cooking correlates with poverty, and that several countries in Sub-Saharan Africa and Southern Asia, in particular, have seen only marginal progress in access to clean cooking and have growing population lacking access;

(e) In fulfilment of paragraph 61(e), robust and representative data from academic literature[7] are available on the performance of household cooking technologies using fuelwood or charcoal fuel in rural, low-income households, providing the service of thermal energy for meal preparation for residents. Lab-based data are also available for improved cookstoves (ICS), e.g., Jetter et al. 2012, Still et al. 2015.

6. Following an approach modelled on version 01.0 of the baseline standard for baseline determination following paragraph 36 (ii), performance thresholds for thermal efficiencies of 16.6 per cent for fuelwood fired stoves and 27.4 per cent for charcoal fired stoves are identified. These efficiencies are applied as the threshold for the performance-based approach for additionality, in fulfilment of paragraph 63 of the additionality standard.

7. Since these conditions are fulfilled, the mechanism methodology defines the performance-based approach as threshold thermal efficiencies of cooking technologies and practices using fuelwood and charcoal (two thresholds).

(a) Thresholds can be identified by combining data from academic studies with conservative assumptions that apply to the locations that fulfil the applicability conditions of this mechanism methodology, i.e., rural, low economic development, where the solid biomass fuels fuelwood and charcoal dominate household cooking energy.

(b) Interpreting Gill-Wiehl et al. 2026, 1.54 per cent per year of households in contexts like those complying with the applicability conditions of this mechanism methodology and passing the regulatory analysis test may be expected to adopt an ICS, as a conservative assumption. Over a period of three years, 4.6 per cent of cookstoves may have the performance level of an ICS (conservatively assumed as 32.72 per cent for fuelwood ICS based on Jetter et al. 2012, and 45 per cent for charcoal ICS based on Still et al. 2015), while 95.5 per cent would have average performance level for unimproved cookstoves (11.8 per cent for fuelwood, 22.1 per cent for charcoal based on Urban et al. 2025). The top 20 per cent of the performance is selected[8], recognizing the wide variability in cookstove performance in the field, and this would give a weighting of 76.9 per cent with the performance of an unimproved cookstove and 23.1 per cent with the performance of an ICS.

[7] e.g., Quantifying the Efficiency and Fuel Consumption of Cooking with Traditional Wood and Charcoal Stoves in Malawi, Ghana, and Kenya-Urban et al. 2025.

[8] The top 20% (the top quintile) is a common method for defining high performance or efficient households in energy benchmarking. It isolates true out-performers, not just slightly above-average households and avoids including the middle of the distribution, which may be influenced by normal variability. This aligns with how other benchmarking bodies define performance tiers e.g., ENERGY STAR frequently uses percentile-based groupings to segment building or household energy performance into statistically meaningful slices.

(c) The Jetter et al. 2012 and Still et al. 2015 methods are based on laboratory tests, meaning they likely overestimate the efficiency of the ICS compared to field conditions, which is conservative for the purposes of a performance threshold for additionality.

8. Applying the weighting set above, this gives a threshold efficiency of 16.6 per cent for fuelwood fired stoves and 27.4 per cent for charcoal fired stoves. These efficiencies are applied as the threshold for the performance-based approach for additionality.

9. Each threshold ensures that the Article 6.4 activity is very likely (at least 90 per cent probability) to be additional. The likelihood is based on a combination of the findings of Gill-Wiehl et al. 2026 and the further conditions of this mechanism methodology in the regulatory analysis section of the additionality demonstration, which require that no subsidy is being provided by public sector finance for cleaner cooking, or that any support provided is insufficient to render the activity financially viable. The academic study used a combination of review of published studies and primary data collection and found that 4.2 per cent per year of households in contexts similar to those of the applicability conditions of this mechanism methodology obtained an improved cookstove; however, this weighted average value was influenced by one particular case in which a national government implemented a subsidy for liquified petroleum gas (LPG) stoves during the time of the measurements. By eliminating cases where subsidies are present through the condition in the regulatory analysis of this mechanism methodology, the average non-additionality rate per year (autonomous adoption) would be closer to 1.5 per cent and the likelihood of additionality may be considered above 90 per cent.

10. The validity of the thresholds shall be the same as the validity of this mechanism methodology (31 December 2030), given the slow pace of change in the areas where lack of access to clean cooking is dominant (IEA 2025, Stoner et al. 2021), since locations that fulfil the applicability conditions of this mechanism methodology are generally consistent with the characteristics of those areas. Once the validity of these thresholds ends, the thresholds shall be re-evaluated based on up-to-date data and information on the autonomous adoption of improved cook stoves (ICS) in locations that fulfil the applicability conditions of this mechanism methodology and on the thermal efficiency of baseline and ICS devices.

3. Setting an ambitious benchmark for the baseline

11. The ambitious benchmark approach is selected since reliable data on the performance of comparable activities providing similar outputs, as well as on the best performing comparable activities, can be obtained. An activity-specific procedure is provided for determining the energy efficiency value to input to the ambitious benchmark to determine the indicator in fuel *i* per person per year in units of TJ / (person x year).

12. The type of activity provides the service of thermal energy for cooking events for residents of the household and can be standardized on the basis of the energy demand for the meals for a single person. The emissions per unit output depend on multiple factors including, primarily, the efficiency of the technologies used for cooking, the fuel type(s), and the cooking practices.

13. The ambitious benchmark is identified as the average emissions or removals level of the best performing comparable activities that provide similar outputs in the project activity or component project circumstances.

14. The ambitious benchmark is identified using an activity-specific procedure prescribed in the mechanism methodology that determines the ambitious benchmark efficiency for the activity and combines this with the default useful energy delivered and the average net calorific value of fuelwood or charcoal.

15. A backstop to the activity-specific ambitious benchmark is provided by combining the performance threshold efficiencies with the default useful energy delivered and the average net calorific value of fuelwood and charcoal, and this results in a backstop value of 0.49 tonnes of fuelwood per person per year (0.0077 TJ per person per year) for households using wood as the primary fuel, and 0.14 tonnes of charcoal per person per year (0.0040 TJ per person per year) for households using charcoal as the primary fuel.

16. For the baseline emissions determination, the efficiency benchmark is combined with the useful energy required for satisfying basic human needs related to meal preparation. An assumption is applied of 3.5 MJ per person per day (fuelwood) 3 MJ per person per day (charcoal) of delivered energy for cooking. These values are supported by empirical data that households primarily using charcoal tend to have a lower final energy consumption than those primarily using fuelwood, as reflected in the PMM004 submission. It is also consistent with the review presented in Gill-Wiehl, et al. 2024 that cites a reasonable range of 2–4 MJ delivered per person per day and is consistent with the threshold value for useful energy delivered for cooking and heating up to 2.1 GJ per person per year (equivalent to 5.75 MJ per person per day) included in the “Standard: Addressing Suppressed Demand in mechanism methodologies”.

17. The validity of the ambitious benchmarks shall be the same as the validity of this mechanism methodology (31 December 2030), given the slow pace of change in the areas where lack of access to clean cooking is dominant (IEA et al. 2025) and the stability of useful energy required for satisfying basic human needs related to meal preparation.

4. Exemption from downward adjustment

18. No downward adjustment is determined in the calendar year of the start date of the first crediting period since the ambitious benchmark approach (paragraph 36(ii) of the RMPs) is applied.

19. In line with paragraphs 65 and 66 of version 01.0 of the “Standard: Setting the baseline in mechanism methodologies” (A6.4-STAN-METH-004), the mechanism methodology applies an exemption from the downward adjustment in subsequent years. While the standard notes that economic viability could be a consideration for exemptions, the standard does not preclude other considerations.

20. Here the exemption is provided on the grounds that this mechanism methodology provides significant benefits to communities with the lowest income. Efficient cookstoves reduce fuel costs and the time spent for collecting firewood, benefiting low-income households that often devote a large share of their income and labour to cooking energy, in many cases particularly women. They also may reduce exposure to indoor air pollution, which disproportionately affects women, children, and vulnerable communities who spend significant time near traditional stoves. These communities are often also particularly affected by the impacts of climate change and have contributed the least to global greenhouse gas (GHG) emissions. Based on these considerations, the exemption from a downward adjustment aims to facilitate the implementation of this project type.

5. Calculation of baseline and activity emissions

21. The concept of Ψ, the per cent of activity households with the project cookstove present that qualify as **user households**, is applied to calculate baseline and activity emissions. The mechanism methodology includes a tentative requirement for what constitutes a user: A user is defined as an activity household with a functioning project cookstove that is in use five time or more per week during a given monitoring period, confirmed through both self-reporting (annual usage surveys) and visual inspection and through SUMs measurement (optional during a transition period). This determination indicates whether the household can be included in the emission reductions calculations and is not used to calculate fuel consumption for that household. This is combined with the sum of the number of days for which project cookstoves are available (at each activity household, within the activity boundary, and functioning) of a given monitoring period.

22. A minimum threshold requiring cookstoves to be in use **at least** five times per week is established to indicate regular ongoing use and to provide a consistent minimum definition for all Article 6.4 activities under this mechanism methodology. This threshold provides a practical criterion for determining whether a household is included in emission reduction calculations. Importantly, this “user” designation does not affect how much fuel consumption is attributed to the household, but rather, whether baseline fuel consumption is attributed at all. To calculate emission reductions, activities also need to measure the actual activity fuel consumption of included households via KPTs. KPTs directly measure household fuel consumption under real-world usage conditions. Because KPTs reflect actual cookstove use, including the effects of partial adoption and stacking with other technologies, any underutilization of project cookstoves is already accounted for in the fuel consumption estimates. Activity participants thereby have incentives to choose project cookstoves that are highly suitable and desirable for the activity households, so that they will replace the use of their existing cooking devices as much as possible.

23. To adjust for any potential **Hawthorne effect** (i.e. a household may increase their use of the project cookstove when the KPT is being performed due to social desirability bias), the mechanism methodology requires that activities either cap their emission reductions at 75 per cent of what the activity KPT-based estimate would be during a transition period, or measure any effects directly with stove use monitors (SUMs), comparing stove use during the KPT to the month before or after. If a potential Hawthorne effect is measured using SUMs (meaning SUMs don't show sustained project cookstove use), emission reductions will be adjusted proportionally downward. Activity participants cannot increase A6.4 ERs based on SUMs data used to measure the Hawthorne effect. The 75 per cent cap on emission reductions when the Hawthorne effect is not directly measured is conservative based on a review of published and grey literature. This review included one focused study that found a strong Hawthorne effect (Simons et al. 2017), as well as recently released findings from a 2012-13 study by Berkeley Air Monitoring Group that did not find evidence of a strong Hawthorne Effect (BAMG 2025), and others reported in Gill-Wiehl et al. 2024 that did find evidence of the Hawthorne effect. Given the contrasting results and lack of multiple results finding a strong effect, 75 per cent is considered appropriate in the context of the transition period toward direct monitoring.

6. Emission factors

24. Default emission factors are set in the mechanism methodology for direct (point-use) CO_2, CH_4 and N_2O emissions from combusting fuelwood and charcoal in cookstoves in

households in the rural, low-income contexts eligible for this mechanism methodology. The emission factors for fuelwood combustion are the central default values for residential categories from table 2.5 of IPCC 2006. These are considered average for the CO_2 emission factor, and tending toward conservative for the CH_4 and N_2O emission factors, since combustion efficiency in traditional stoves tends to be relatively lower (MacCarty et al. 2010), correlated with higher CH_4 emissions (e.g., Jetter et al. 2012). N_2O emissions have been less studied in this context, but the research on pollutant emissions of charcoal stoves summarized in 4C 2025b found much higher emissions of N_2O from traditional cooking technologies.

25. The CO_2 and CH_4 emission factors for charcoal combustion are drawn from context-specific research that better reflects activity conditions (Akagi et al. 2011, Bertschi et al. 2003, Brocard et al. 1996 and Smith et al. 2000). The CO_2 emission factor is lower than the IPCC 2006 factors (since a larger per cent of the C in charcoal is emitted as CO-included in the emission factor due to short life and oxidation in the atmosphere-, CH_4 and non-methane hydrocarbons (NMHC), instead of CO_2, under these combustion conditions) and is considered conservative. The CH_4 emission factor is the IPCC 2006 central value, which is considered tending toward conservative for this context based on the literature. The N_2O emission factor is the IPCC 2006 upper bound, which is considered conservative for this context, given that it is still 2.5 times lower than the values reported in context-specific research summarized in 4C 2025b.

26. Default emission factors also are set for upstream CO_2, CH_4 and N_2O emissions from the production of artisanal charcoal in kilns. Artisanal charcoal kiln emissions are analysed and emission factors derived from an analysis of data from Bertschi et al. 2003, Smith et al. 1999, Pennise et al. 2001, and three other peer-reviewed studies with measurements from low- to middle-income settings in Sub-Saharan Africa, Asia, and the Americas. The average conversion rate from the studies is 3.5 tonnes of oven-dry wood per tonne of charcoal; however, those studies were conducted under controlled conditions that tend to yield higher conversion efficiencies than those typically observed in field conditions. Therefore, the CO_2 and CH_4 emission factors from the studies are adjusted to reflect a higher wood-to-charcoal conversion factor. Wood-to-charcoal conversion factors are reported in Urban et al. 2026 and reviewed and discussed in 4C 2025a. The review found that the individual measurements in the studies focused on conversion efficiency have mean and median values around 17 per cent (5.8:1). Further, Urban et al. 2026 undertook field studies of earth mound kilns prepared, operated and harvested by kiln operators in Ghana and Malawi and found an overall weighted average of 7.1:1 and variable performance across kilns. With this, a conversion factor of 5:1 is considered conservative, as are the resulting emission factors for CO_2 and CH_4 applying this conversion factor. The N_2O emission factor is also taken from the context-specific research and is considered an average value (4C 2025b). When compared with the emission factors for charcoal production from table 4.3.3 of IPCC 2019, the default emission factors in this methodology fall in the range between the average and upper bound default emission factors, and the IPCC 2019 ranges do not consider conversion efficiencies other than those directly reported in the studies of controlled conditions.

7. Determination of a conservative BAU scenario

27. The business as usual (BAU) scenario is standardized at the methodological level considering that locations that fulfil the applicability conditions of this mechanism methodology are generally consistent with the characteristics of areas where lack of access to clean cooking is dominant and a slow pace of change in access has persisted for decades (IEA et al. 2025, Stoner et al. 2021). This IEA report confirms that lack of access to clean cooking correlates with poverty, and that several countries in Sub-Saharan Africa and Southern Asia, in particular, have seen only marginal progress in access to clean cooking, and that many in Sub-Saharan Africa have growing population lacking access; in other words, in these contexts, there is a trend toward equal or more people using equally inefficient cooking methods, rather than a trend toward improved cooking methods consistent with clean cooking. Therefore, the BAU scenario is selected as the continuation of the historical situation (pre-activity scenario).

28. Since the activity is not a greenfield activity, this mechanism methodology considers the historical intensity of use of cooking fuels prior to the implementation of the activity, without any trends toward improving performance, since these are not evidenced for the areas targeted by this mechanism methodology. In the same line of reasoning, the mechanism methodology assumes that if a baseline cookstove reaches the end of its lifetime during the crediting period, the household, in the absence of the activity, would replace it with a cookstove of the same type and performance, since without targeted support, households are unlikely to transition to improved or cleaner cookstoves due to persistent affordability and access barriers, in the absence of legal requirements or comprehensive government subsidies, which are addressed in the additionality demonstration and would result in the ineligibility of an activity under this mechanism methodology.

29. The mechanism methodology includes a step to identify and incorporate any policies, legal requirements, or targets relevant to quantifying the BAU in the steps for quantifying the BAU emissions.

30. The basis for identifying the conservative BAU baseline is paragraph 77(b) of version 01.0 of the baseline standard which allows using another approach than the approach set out in paragraph 77(a) provided that it ensures that the selected crediting baseline is below BAU, considering the minimum discount described in the method contained in paragraph 77(a) of version 01.0 of the baseline standard.

31. The purpose of determining a conservative BAU baseline in the baseline standard is ensuring that the crediting baseline is below BAU, considering the minimum discount. In the context of this mechanism methodology several parameters used in the calculation of baseline emissions and BAU emissions are identical, including delivered energy for cooking, net calorific value (NCV) of fuels, emission factors of fuels, and fNRB values of fuels. Therefore, in the specific context of this mechanism methodology, the uncertainty associated with these parameters does not need to be considered when determining the conservative BAU baseline and comparing it to the crediting baseline. In this mechanism methodology, the crediting baseline is below the BAU baseline if the energy consumption in the baseline scenario is below the energy consumption in the BAU baseline. Therefore, this alternative approach focuses on comparing the energy consumption.

32. The energy consumption depends on the thermal efficiency of the baseline cookstove. For the BAU scenario, data from academic research on the thermal efficiency of baseline cooking is used.

33. This research found the mean thermal efficiency for wood-based cooking across all identified studies is 11.87 per cent, as detailed in Table 3 below:

Table 1. Thermal efficiency for traditional wood-based stoves

Source	**Central value** (per cent)	**Setting**
Urban et al. — *Quantifying the Efficiency and Fuel Consumption of Cooking Technologies in Carbon Crediting Frameworks (2025)*	11.80	Field testing
Destaw et al. (2025)	13.0	*Laboratory (WBT)*
Sutar et al. (2018)	10.0	*Laboratory*
Jagger et al. (2017)	12.0	*Laboratory (WBT)*
MacCarty, Still & Ogle – *Fuel use and emissions performance of 50 cooking stoves (2010)*	12.0	*Laboratory benchmark testing*
MacCarty et al. – *Laboratory comparison of biomass cookstoves (2008)*	13.0	*Laboratory*
Smith et al. combustion synthesis (2000)	12.5	*Laboratory synthesis*
Aprovecho Research Center / Dean Still (Various)	12.5	*Mixed lab + field experimental*
Engineering review papers (2025)	10.0	*Literature synthesis*
- Results -		
n: Population (number of studies considered)	9	
Mean (per cent)	11.87	
Median (per cent)	12.00	
Maximum (per cent)	13.0	

34. Similarly, various authors found the mean thermal efficiency for traditional charcoal-based cooking technologies. The mean thermal efficiency across all identified studies is 21.27 per cent, as detailed in Table 2 below.

Table 2. Thermal efficiency for traditional charcoal stoves

Source	**Central value** (per cent)	**Setting**
Urban et al. *Quantifying the Efficiency and Fuel Consumption of Cooking Technologies in Carbon Crediting Frameworks (2025)*	22.10	*Field testing*
MacCarty, *Still & Ogle – Fuel use and emissions performance of 50 cooking stoves (2010)*	22.50	*Laboratory benchmark testing*
Adeyemi et al. – *Thermal Performance of Improved Charcoal Stove…(2017)*	15.00	*Laboratory testing*
Zhang et al. – *Assessment of pollutant emissions and energy efficiency of charcoal stoves (2018)*	21.00	*Laboratory testing*
Sultane – *Studies of energy efficiency and market access of domestic charcoal stoves*	22.00	*Laboratory testing*
Clean Cooking Alliance testing databases (various)	25.00	*Literature synthesis*
- Results -		
n: Population *(number of studies considered)*	6	

Source	**Central value** (per cent)	**Setting**
Mean *(per cent)*	21.27	
Median *(per cent)*	22.05	
Maximum *(per cent)*	25.00	

35. For conservativeness, the maximum value of the identified studies is selected as the conservative BAU efficiency.

8. Leakage

36. Potential sources of leakage are addressed in accordance with the "Standard: Addressing leakage in mechanism methodologies".

8.1. Identification of leakage

37. The following potential sources of leakage are identified and analysed.

38. Activity households may always continue to make **use of pre-activity technologies** to ensure they maintain an equal or better level of service during the activity as in the baseline, if they find the activity technology does not suit 100 per cent of their needs. Such simultaneous stove use will be captured in the activity emissions calculations and does not constitute leakage. The Article 6.4 activities are incentivized to select technologies and fuels that meet the cooking needs of the target population to substitute the level of service provided in the baseline in the most effective way possible, since the most effective substitutes will achieve the highest emission reductions.

39. **Baseline equipment transfer** is not relevant, since baseline equipment may be maintained; or, if it is replaced completely, it does not present a value for third parties, or if its components are re-used, it can be assumed that this is because it replaces more GHG-intensive alternatives, since otherwise it would not offer any benefits for a third-party user.

40. The Article 6.4 activity reduces the consumption of the same resource used in the baseline (i.e., harvested biomass in the form of fuelwood or charcoal) and therefore avoids **resource diversion**.

41. One theoretical source of negative leakage is if the **reduction in harvested biomass means that more is available for other users, and these other users utilize the same biomass that was reduced by the Article 6.4 activit**y. However, no leakage emissions are estimated from this potential source to be consistent with Gill-Wiehl et al. (under review), which found that in the context of interventions in households that reduce harvested biomass use, neighbouring households generally experience no change in, or also decrease, their own harvested biomass use.

42. Leakage may occur associated with the **project cookstoves, including their materials, manufacture, and transportation**.

43. Potential sources of positive leakage are also identified. First, when efficient cooking activities such as those eligible under this mechanism methodology are successful, they reduce the demand for fuelwood or charcoal. At sufficient scale, this may impact the fNRB of the activity's location, meaning that **the harvested biomass consumed as fuel**

becomes more renewable, reducing the net emissions of both the activity households and the neighbouring households. Such impacts are not captured in this mechanism methodology and could lead to positive leakage. Second, sustained, reduced harvesting of biomass may permit the standing trees and landscapes to regrow beyond the levels that were obtained in the pre-activity situation. Any such additional carbon storage in biomass is not captured in this mechanism methodology and could lead to positive leakage. Omission of these two potential sources of positive leakage is conservative.

8.2. Avoidance or minimisation of leakage

44. No sources of leakage were identified that need to be avoided or minimized.

8.3. Calculation and subtraction of leakage

45. Leakage associated with the project cookstoves, including their materials, manufacture, and transportation, shall be calculated and estimated. An estimate of the potential emissions from these sources for industrially manufactured, imported cookstoves was developed based on assumptions about cookstove materials (steel), mass (about 5 kg), and locations of manufacturing and use (China and east Africa, respectively), using emission factors from the World Steel Association and the Global Logistics Emissions Council, to derive an estimate of related leakage emissions of 0.0128 t CO_2eq/unit. As a simplification, locally produced stoves are assumed to have about half those upstream emissions. The calculation for these potential leakage emissions is included in the methodology. Activity participants may instead use the results of a verified Life Cycle Analysis (LCA) study for the project cookstoves, if available, to provide an activity-specific value.

9. Uncertainty assessment

46. Uncertainty analysis was carried out at the mechanism methodology level through a Monte Carlo simulation of key parameters. The simulation compared scenarios considering variation in the values of per person energy use, household size, usage rate, fNRB, point- and upstream-emission factors, baseline stove efficiency, project stove efficiency and Hawthorne effect.

47. For each of these parameters, a central value plus an uncertainty range and a normal distribution were used as the source to draw the combinations used in the simulations. As an example, for the purpose of determining the baseline fuel energy use, the central value for baseline stove efficiency corresponded to the most likely BAU value (and not one of the baseline approaches eligible under the RMPs), and the baseline stove efficiency input values for fuelwood fired stoves were 0.118 as the central value, and anchoring values for the uncertainty range of 0.065 and 0.171.

48. The simulation applied a variety of rules, constraints and screenings to seek to reflect real-life conditions in a reasonable way. A variety of hard, physical constraints were reflected in the simulation, such as ensuring that combinations of emission factors did not violate the carbon-content limit of the underlying fuel. Also, value-picking was constrained for parameters that are expected to be the same in the baseline and activity (e.g., fNRB) so that the same value was applied to both parameters. However, from simulation to simulation, the selection of values for parameters that are independent was not constrained (e.g., any value of per person energy use could be combined with any value

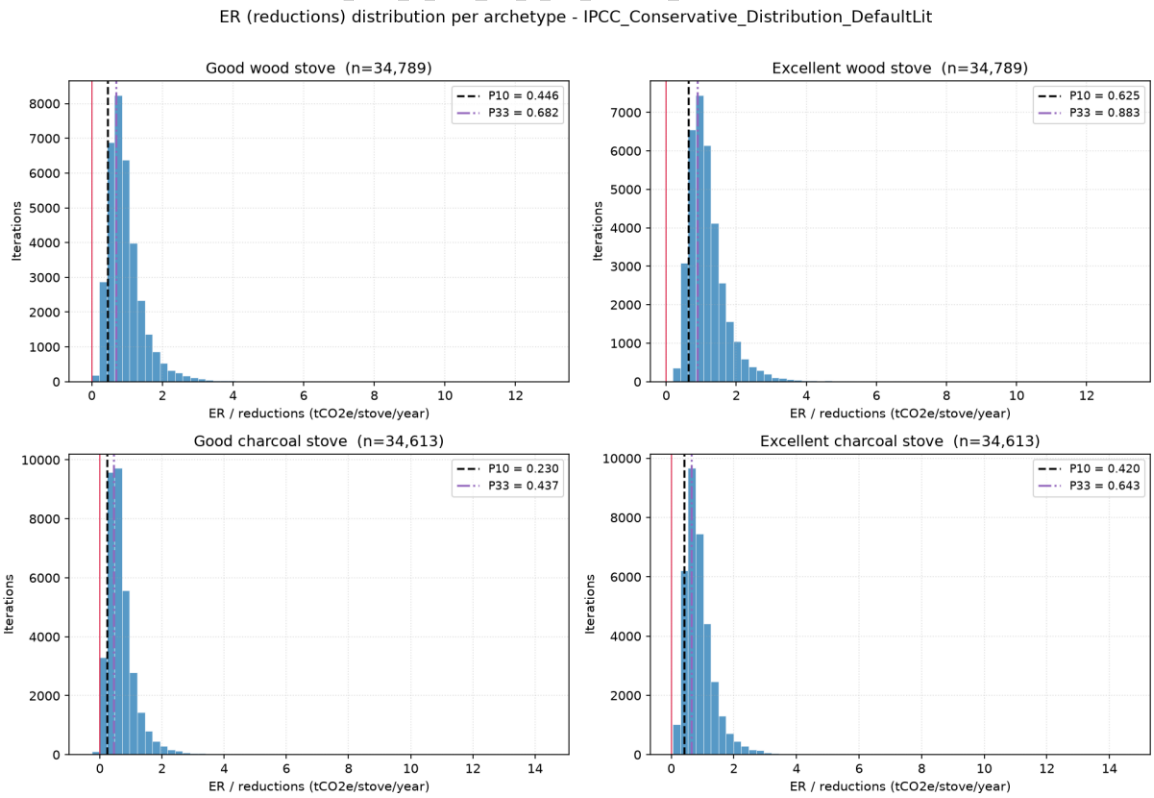
of usage rate). Four main activity scenarios were evaluated based on project cookstove efficiencies of 25 per cent and 35 per cent as a central value for wood stoves, and 35 per cent and 45 per cent as a central value for charcoal stoves.

49. Table 3 below displays the numerical results of the Monte Carlo simulation (rows in bold) as tCO_2eq emission reductions per household and compares to single estimations following the requirements in the mechanism methodology.

Table 3. Comparison of results of the Monte Carlo simulation (t CO2eq per house-hold)

Scenario	Wood stove (25%)	Wood stove (35%)	Charcoal stove (35%)	Charcoal stove (45%)
MEP013 methodology proposal	0.338	0.551	0.110	0.377
MEP014 methodology proposal	0.389	0.613	0.141	0.487
Simulation Approach A at P10	**0.446**	**0.625**	**0.230**	**0.420**
Final: Mean ER (Monte Carlo)	**0.950**	**1.173**	**0.678**	**0.909**
P10 as % of central	**46.9%**	**53.3%**	**33.9%**	**46.2%**

Figure. Results of the Monte Carlo simulation (tCO2eq per household) indicating P10 and P33



50. Paragraph 13 of the appendix to version 01.0 of the Baseline Standard requires that emission reductions be "very unlikely to be overestimated, taking into account the overall uncertainty." In IPCC AR5 calibrated uncertainty language, "very unlikely" means below 10 per cent probability (e.g., AR5 WG1 Technical Summary (TS), Box TS.1). In analysing the results of the Monte Carlo simulation of emission reduction results, paragraph 13 aligns with a one-sided test since it concerns overestimation, not underestimation. Hence, the 10^{th} percentile of the results (P10) implements "very unlikely to be overestimated" because there is a 90% probability that the true emission reductions exceed the P10 value.

51. The P10 of the results of the Monte Carlo simulation were found to be in the range of, or higher than, the quantification resulting from the methods and parameter values included in this mechanism methodology. Therefore, the MEP concluded that the emissions reductions calculated using this mechanism methodology are very unlikely to be overestimated and concluded that it is not required for individual A6.4 activities to undertake uncertainty analysis.

10. Non-permanence

10.1. Demonstration of eligibility to propose alternative approaches

52. Paragraph 13 of version 01.0 of the Reversals Standard provides that mechanism methodologies may propose alternative approaches to certain elements of the Removals Standard, provided that all of the following conditions are met:

(a) That activity participants using the mechanism methodology have no control over the GHG reservoir;

(b) That the GHG reservoir is not in the same location as where the mitigation activity is implemented; and

(c) That changes observed in the GHG reservoir cannot be attributed to the mitigation activity.

53. This methodology satisfies the requirements referenced in paragraph 52 because:

(a) Activity participants affect, but do not have control over, the GHG reservoirs listed in Table 2;

(b) The physical, geographical sites where the project cookstoves operate (paragraph 18(a)) are always distinct from the location(s) from which fuels are produced or collected in the baseline and activity scenarios (paragraph 17(b)), which location(s) correspond to the GHG reservoirs listed in Table 2 and which are defined at a subnational, national, or multi-national level for each applicable fuel (paragraph 23); and

(c) Energy efficiency measures in household cooking reduce the consumption of non-renewable biomass and associated loss of carbon stocks but are just one of many factors that affect carbon stocks in the greenhouse gas reservoirs listed in table 2. As a result, observed changes in carbon stocks in these reservoirs at the subnational, national, or multinational level(s) cannot be directly attributed to energy efficiency measures in household cooking.

10.2. Selection and justification of alternative approaches

54. Paragraph 15 of the Reversals Standard allows mechanism methodologies that meet the conditions referenced in paragraph 52 to propose alternatives to the following provisions of version 01.0 of the Removals Standard:

(a) General requirements for the identification and quantification of reversals (section 7.1 of version 01.0 of the Reversals Standard);

(b) Frequency of submitting monitoring reports (section 7.2 of version 01.0 of the Reversals Standard);

(c) Monitoring and reporting in the post-crediting period (section 7.4 of version 01.0 of the Reversals Standard).

(d) Reversal-related notifications and reports (section 2 of version 01.0 of the "Information note: Elements related to non-permanence and reversals for inclusion in relevant regulatory documents" (A6.4-SBM018-A14)[9] (hereinafter referred to as “Information Note”).

(e) Post-crediting period monitoring and reporting (section 4 of the Information Note); and

(f) Post-reversal actions (section 5 of the Information Note).

55. This methodology adopts an alternative approach as follows:

(a) The methodology exempts activity participants from all of the provisions listed in paragraph 54. The practical effect of these alternative approaches is that activity participants will not monitor or report on the GHG reservoirs listed in Table 2, either during the crediting period or in the post-crediting monitoring period; will not produce any reversal-related notifications or reporting for any reversals that may or have occurred; and will not perform any post-reversal actions; and

(b) The methodology requires that when A6.4ERs are contributed to the reversal risk buffer pool account, they are immediately cancelled to remediate any potential reversals that may occur in the future (see paragraph 114).

56. When a mechanism methodology proposes alternative approaches, paragraph 13 of version 01.0 of the Reversals Standard requires:

(a) That the alternative approaches ensure, with a high level of confidence, that reversals from Article 6.4 activities are fully remediated in the crediting period and post-crediting monitoring period; and

(b) That the alternative approaches do not cause instances of moral hazard.

57. This methodology satisfies the requirements referenced in paragraph 56 because:

(a) All A6.4ERs that are contributed to the reversal risk buffer pool account are immediately cancelled to account for potential reversals in the crediting period and in the post-crediting monitoring period. Because the number of A6.4ERs

[9] See https://unfccc.int/sites/default/files/resource/A6.4-INFO-METH-002.pdf.

contributed to the reversal risk buffer pool account is determined using the "Methodological tool: Reversal risk assessment" (A6.4-AMT-0XX)[10], which calculates the 100-year reversal risk rating for the GHG reservoirs listed in Table 2 of the methodology, these alternative provisions remediate any reversals that may occur in the future.

(b) Moral hazard requires that activity participants have the ability and interest to cause reversals or increase the risk of reversals through their own actions. Here, activity participants do not have any control over the GHG reservoirs listed in Table 2 of the mechanism methodology, which categorically limits the potential for moral hazard. Furthermore, activity participants' interests are directly aligned with reducing any risk of reversal over which they have control or influence. Because the number of A6.4ERs issued to activity participants is based on the use of efficient project cookstoves that reduce the consumption of fuelwood or charcoal, and therefore that reduce emissions from the GHG reservoirs listed in Table 2 of the mechanism methodology, activity participants have a direct economic interest only in actions that reduce emissions from the reservoir (rather than increase them).

10.3. Consistency with the Reversals Standard

58. Paragraph 18 of version 01.0 of the Reversals Standard requires that mechanism methodologies quantify emission reductions and net removals "consistent with the equations" in section 6 of version 01.0 of the Reversals Standard. This mechanism methodology complies with this requirement for the reasons provided Table 4

Table 4. Comparison of equations in the Reversals Standard and this methodology

Reversal Standard	This methodology	Rationale
Equation (1)	Equation (9)	Consistent because the application of the fNRB tool calculates changes in the quantities of storage the GHG reservoirs Table 2; see the definitions of "Harvested biomass" and "Fraction of non-renewable biomass" in paragraph 6 of version 01.0 of the fNRB Tool
Equation (2)	Not applicable	Not applicable because activity participants would not be required to monitor or report reversals in the post-crediting monitoring period (see section 10.1 of the mechanism methodology)
Equation (3)	Equation (35)	Consistent because the calculation of the net change in the emission of GHG is fully accounted for in the mechanism methodology
Equation (4)	Equation (35)	Consistent because the application of the fNRB Tool is consistent with equation (1) of version 01.0 of the Reversals Standard and the crediting

[10] This draft methodological tool is still under development and is yet to be approved by the supervisory Body. The methodology will be revised to reflect any changes to the adopted version of the draft methodological tool.

Reversal Standard	This methodology	Rationale
		deficit is not applicable, as discussed in this table below
Equation (5) Equation (6) Equation (7)	Not applicable	Not applicable. There cannot be a crediting deficit because (a) all default values in the fNRB Tool are equal to or greater than zero and (b) activity participants would not be required to monitor or report reversals in the post-crediting monitoring period (see sections 10.1 and 10.2 of this appendix)
Equation (8)	Equation (34)	Consistent because the methodology applies the parameter $F_{buffer,i,t}$ to credited changes in forest carbon storage
Equation (9) Equation (10)	Mandated externally	Contributions of A6.4ERs to the Adaptation Fund and cancellation of A6.4ERs for the purpose of overall mitigation of global emissions are addressed by the “Procedure: Article 6.4 mechanism registry” (A6.4-PROC-REGS-001
Equation (11)	Equation (36)	Consistent because there are no substantive differences between the equations

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Document information

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01.0	24 April 2026	MEP 013, Annex 2. A call for input on this document will be issued following the conclusion of the MEP 013 meeting. The input received will be considered by the MEP for the further development of this document at a future meeting. This draft mechanism methodology is developed based on CDM methodology AMS-II.G.

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