Gold Standard for the Global Goals

Climate Security & Sustainable Development

METHODOLOGY

GS4GG PAA M400-08

SDG 13

REDUCED EMISSIONS FROM COOKING AND HEATING (RECH)

FORMERLY TECHNOLOGIES AND PRACTICES TO DISPLACE DECENTRALIZED THERMAL ENERGY CONSUMPTION (TPDDTEC)

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SUMMARY

This methodology is applicable to activities that introduce technologies and/or practices that reduce or displace greenhouse gas (GHG) emissions from the thermal energy consumption of households and/or residential, institutional, industrial, or commercial facilities. It is an updated version of the Technologies and Practices to Displace Decentralized Thermal Energy Consumption (TPDDTEC) methodology V4.0, incorporating new eligibility criteria and alignment with Gold Standard for the Global Goals (GS4GG) Article 6 requirements.

This methodology shall be used in conjunction with the GHG Emissions Reduction & Sequestration Product Requirements and activities and programmes applying this methodology may be issued with GSVERs.

Key Methodological Components:

- This methodology applies to non-metered thermal energy technologies where fuel consumption is estimated through sampling and field measurements. Activities involving metered energy cooking devices are covered under the Metered & Measured Energy Cooking Devices (MECD) methodology.
- Emission reductions are quantified using field-based measurements, through Kitchen Performance Tests (KPT) and supporting monitoring surveys, to

capture total household fuel consumption under real-world conditions, including the effects of stove stacking and behavioural responses.

- Emission reductions from biomass fuel savings are determined using the fraction of non-renewable biomass (fNRB). Values may be derived using approved standardized tools or robust activity-specific assessments, subject to validation.
- The methodology includes upstream emissions from fuel production and processing, including charcoal production emissions using a Wood-to-Charcoal Conversion Factor (WCCF).
- Baseline fuel consumption is constrained using Minimum Service Level assumptions and per-capita fuel consumption caps to prevent over-estimation of baseline demand and ensure conservative crediting.
- To increase mitigation ambition over time and align with national decarbonization pathways, baseline emissions are adjusted using a fixed Downward Adjustment Factor (DAF) determined using the GS4GG Methodology Tool 05 - Downward Adjustment Factor Determination.

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1| KEY INFORMATION

1.1.1 | The following table describes the key information for the application of the methodology.

Table 1. Key information

Term	Description
Activity summary	The activity (also referred to as project or project activity) involves the introduction of technologies and/or practices (e.g., improved cookstoves, water heaters, space heaters, ovens, dryers) that reduce or displace greenhouse gas (GHG) emissions from the thermal energy consumption of households, residential, institutional, industrial, or commercial facilities.
Mitigation type	☒ Emission reductions
Applicable activity scale	☒ Micro scale (e.g., ≤10,000 tCO_2e per year) ☒ Small scale (≤ 180GWh_{th}/yr energy savings) ☒ Large scale (> 180GWh_{th}/yr energy savings)
Sectoral Scope	3. Energy demand
Activity Requirement	Community Services
Activity start date	The start date is the date of implementation of the first unit under the mitigation activity.
Crediting Period start date	The date of the start of use of the first device distributed/installed or a maximum of two years prior to the date of activity design certification, whichever occurs later. For phased distribution, the crediting period start date is the operations start date of the first distributed/installed unit within the activity boundary. Subsequent units generate emission reductions from their respective operations start dates.
Crediting period length	The maximum crediting period is five years, renewable twice (total of 15 years). The crediting period shall not exceed the technical lifetime of the activity technology unless measures for replacement or maintenance are in place.
Geographical applicability	Global
Limitations	No additional limitations beyond the applicability criteria

2| DEFINITIONS

2.1.1 | The definitions outlined in the Glossary of Gold Standard for the Global Goals, Activity Requirements, and the referenced standards and tools shall apply, in addition to those outlined below:

Table 2. Terms and definitions

TERM	DEFINITION
Artisanal cookstoves	Cookstoves produced by small-scale manufacturing processes that can result in variations in dimensions; generally made by hand by skilled workers, rather than mass-produced in factories.
Batch	The population of cooking devices of the same type commissioned during a specific period (e.g., month or quarter) in a calendar year. The latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch.
Clean Thermal Energy Cooking (CTEC)	A universally applied acronym referring to modern, metered energy cooking devices - that record fuel or energy use directly, or through a supplementary meter, with the ability to record the amount of energy or fuel used for cooking over time. Examples include induction cookstoves, electric pressure cookers (EPCs), solar electric cookers, and metered LPG, biogas, and ethanol cookers. This also includes scenarios where fuel sales records (e.g., for pellets, LPG, ethanol) provide a complete accounting of fuel consumed by activity devices.
Continuous useful energy output	Energy transferred to the contents of a cooking vessel, including the sensible heat that raises the temperature of the contents of the cooking vessel and the latent heat of evaporation of water from the cooking vessel, divided by the time of the operation of the cooking task.
Downward Adjustment Factor (DAF)	A numerical coefficient applied to crediting baselines to ensure the encouragement of ambition by setting crediting baselines below Business-As-Usual (BAU) levels and increasing the ambition of crediting baselines over time. Refer to GS4GG Methodology Tool 05: Downward Adjustment Factor Determination (hereafter GS4GG MT 05), for further details on classification and default DAF.
Stove stacking	The use of multiple stoves or cooking devices concurrently or interchangeably by the same end user. Activity beneficiaries continue to use traditional or other stoves alongside the improved stove, rather than exclusively using a single stove.

Stove Use Monitor (SUM)	Device that quantifies cookstove usage through direct measurements of physical or chemical parameters (e.g., temperature, heat flow) of cookstoves.
Technical life	Average time for which the activity technology may continue to be operated for an extended period in a safe manner and with minimal loss of performance. The technical life shall be as per manufacturer's specification or independent study report.
Technology	The single or multiple technologies and/or practices applied in the activity that result in emission reduction. Throughout the methodology, the term 'technology' should be read as including 'practices'.
Traditional stove	A three-stone fire, or a conventional system with no improved combustion air supply or flue gas ventilation system, i.e. without a grate or chimney.
Wood-to-charcoal conversion factor (WCCF)	A factor expressing the amount of wood required to produce a standard quantity of charcoal - typically expressed as a ratio of the mass of air-dry wood input per mass of charcoal output. Activity developers shall apply a stratified default approach: • **Sub-Saharan Africa (SSA) and Least Developed Countries (LDCs):** A default WCCF ratio of 6:1 (approx. 17% kiln efficiency) may be applied, reflecting the dominance of traditional earth-mound kilns. • **Industrialized or High-Efficiency Regions:** A conservative default WCCF ratio of 4:1 (approx. 25% kiln efficiency) shall be applied. • **Optional conservative application:** Activity developers may apply the conservative default WCCF ratio of 4:1 irrespective of the geographic region, including SSA and LDC contexts. Activity-specific overrides for upstream charcoal emission factors are not permitted.

3| SCOPE, APPLICABILITY, AND ENTRY INTO FORCE

3.1 | Scope

3.1.1 | This methodology is applicable to activities that introduce technologies and/or practices that reduce or displace greenhouse gas (GHG) emissions from the thermal energy consumption of households and/or residential, institutional, industrial, or commercial facilities.

3.1.2 | Examples of applicable technologies, practices, and the corresponding emission reduction calculation methods (detailed in Section 7|) are provided in Table 3.

Table 3. Examples of applicable technologies and practices

Technology/Practice	Intervention Type and Baseline Approach
Improved biomass cookstoves	Type A, Type B
Ovens, dryers, space heaters (non-solar)	Type A or Type C
Water heaters (non-solar)	Type A or Type C
Heat retention cookers	Type A or Type C
Solar technologies (Ovens, dryers, space heaters, water heaters, cookers)	Type C
Improved application of technologies (e.g., improved storage and drying of fuels leading to better efficiency)	Type A
Improved solid, liquid, or gaseous fossil fuel cookstoves*	Type C
Practice: The improved application of the technologies in the above rows, for example improved storage and drying of fuels leading to better efficiency of cookstoves due to lower humidity fuels.	Type A

**Note: Applicable only to activities submitted for Design Certification prior to 07/10/2021. Existing registered activities may continue using this methodology until the end of their current crediting period. New activities involving these technologies are not eligible under this methodology and shall apply another applicable methodology.*

3.1.3 | This methodology excludes activity types covered by the Metered & Measured Energy Cooking Devices (e.g., electric cooking technology, biogas stoves, where fuel use is metered). Electric cooking devices (e.g., induction) shall remain excluded and transition to the MECD methodology. Biomass technologies incorporating auxiliary electronic components (e.g., draft fans) where the primary thermal output or fuel consumption cannot be directly metered shall remain eligible under this methodology.

3.1.4 | Where the activity claims emission reductions exclusively from improved practices (without the installation of improved devices), the activity developer shall provide a detailed description of the monitoring approach demonstrating that quantified emission reductions result exclusively from the introduced practices.

3.1.5 | The activity may involve progressive distribution of technology where implementation occurs gradually over the crediting period.

3.1.6 | This methodology may be implemented together with the Methodology Tool 7-D-SMART as an optional MRV add-on. Where applied, the requirements of

this methodology continue to apply unless explicitly replaced by the dMRV tool requirements.

3.2 | Applicability

The methodology is applicable under the following conditions:

3.2.1 | **Technology Specifications:** The activity developer shall choose a technology design with predictable performance, proven to be efficient and durable under field conditions.

3.2.1.1 | All biomass-burning activity cookstove models shall be tested for thermal efficiency using the latest version of ISO Standard 19867-1 or an equivalent national standard or the Water Boiling Test (WBT) protocol. For artisanal cookstoves, at least three randomly-selected samples of each model shall be tested to ensure representative performance.

3.2.1.2 | Minimum thermal efficiency thresholds:

a. Wood-burning technologies that use a griddle surface (e.g., plancha cookstoves): 20% or higher.

b. All other wood cookstoves: 25% or higher.

c. Charcoal cookstoves: 30% or higher.

3.2.2 | **Transition Period:** Technology units distributed on or before 31 December 2027 under activities submitted for design certification prior to the publication date of Version 5.0 are exempt from the minimum thermal efficiency thresholds of V5.0 and shall comply with the thresholds in their registered PDD. All technology units distributed on or after 01 January 2028 shall demonstrably meet the minimum thermal efficiency thresholds defined in this section.

3.2.2.1 | The technology shall have a continuous useful energy output of less than 150kW per unit.

3.2.3 | **Implementation Structure**

3.2.3.1 | Individual households and institutions may be represented collectively (e.g., by community organizations) but do not individually act as activity participants.

3.2.4 | **Baseline Technology Displacement**

3.2.4.1 | The activity developer should implement mechanism(s) (e.g., user agreements, trade-in conditional subsidies, or verified awareness campaigns) to encourage the displacement of baseline technologies. Recognizing that permanent decommissioning of traditional open fires is often unverifiable and stove-stacking is common, the activity shall rigorously account for this via Kitchen Performance Test (KPT) integration. The activity specific - Project KPT (P-KPT) shall capture the total fuel consumption across all primary and secondary cooking devices in the household.

3.2.5 | **Fuel and Biomass Requirements**

3.2.5.1 | **Fossil Fuels:** For activities introducing or utilizing fossil fuels in the activity scenario (e.g., a switch to LPG), only emission reductions from the energy efficiency improvement are eligible. To isolate energy efficiency improvements, the emission factor of the activity fossil fuel (e.g., LPG) shall be used to calculate both the baseline emissions and the activity emissions.

3.2.5.2 | **Biomass Feedstock:** Activities introducing a new solid biomass feedstock (e.g., renewable biomass briquettes or pellets) shall comply with the specific requirements for biomass-related activities, as defined in the Community Services Activity Requirements.

3.2.6 | **Technical life and Replacement:**

3.2.6.1 | If the expected technical life of the technology (Parameter ICS 6) is shorter than the crediting period, the activity developer shall describe measures to provide replacement technology of comparable quality at the end of the technical life or retrofit essential parts with a performance guarantee. No emission reductions shall be claimed after the technical life ends unless these replacement/retrofit measures are documented and verified. Emission reductions for retrofitted/repaired devices may be claimed only if documented and demonstrated through a warranty, guarantee, or standardized durability test (See Parameter ICS 6 for details).

3.2.7 | **Avoidance of Double Counting:**

3.2.7.1 | To avoid double-counting of emission reductions, the activity developer shall:

a. Explain the distribution method in the PDD/VPA-DD;

b. Ensure activity devices are identified with a unique physical identifier or a robust digital identifier and tracked in a relational database (See Parameter ICS 18). To comply with data privacy regulations, geographic tracking may be logged at the lowest permissible administrative unit (e.g., village/ward level) rather than precise household GPS, provided unique product IDs prevent double counting;

c. Communicate ownership rights and intention to claim the emission reductions to all other activity participants, technology manufacturers, and retailers of the activity technology or fuel (See Parameter ICS 2). *Note: Manufacturers of raw, tier-2 components or discrete stove parts are exempt from this requirement*;

d. Obtain and document Informed Consent from the end-users, ensuring transaction records (whether paper or digital) contain a verified assertion in an accessible local language that the user was informed of the carbon title waiver (See Parameter ICS 18);

e. Exclude any devices already included in another voluntary market or PACM/CDM activity/PoA and strive not to displace the cooking devices of another activity/PoA (See Parameter ICS 3).

3.2.7.2 | **Safe Water Supply (SWS) Overlap:** When an improved cookstove (ICS) activity and a safe water supply (SWS) intervention (such as water purification that eliminates the need for boiling), overlap in the same area or households, the activity design shall include measures to prevent double-counting of emission reductions**.**

a. The SWS activity shall calculate its baseline fuel consumption for water boiling by assuming the use of an efficient ICS device. Both activities cannot claim the same fuel savings.

b. To ensure compliance with data privacy regulations, activity developers may utilize GDPR-compliant data-sharing alternatives (e.g., anonymized third-party registry checks) to verify non-duplication across different activity developers.

3.2.7.3 | **Overlap with Jurisdictional REDD+ Programs:** Where the activity boundary overlaps with an implemented Jurisdictional REDD+ (J-REDD+) program or a similar national or sub-national scheme for forestry, the activity developer shall demonstrate that the emission reductions are not subject to double issuance risk.

a. Overlap risk shall be considered immaterial unless the Host Country's Jurisdictional REDD+ FREL/FRL baseline explicitly incorporates and accounts for subsistence household fuelwood consumption as a qualified driver of deforestation. The activity developer shall submit a Declaration of Non-Overlap, which the VVB shall verify against publicly available J-REDD+ registry documents. Absent explicit inclusion of subsistence fuelwood in the J-REDD+ baseline, the emission sources are considered distinct, and no further action shall be required.

b. If a direct conflict exists, the activity developer shall demonstrate that the activity specific reductions are not subject to double issuance risk by providing valid documentation for one of the following options:

i. **Option 1: Accounting Exclusion:** Documentation demonstrating that the jurisdictional program’s Forest Reference Emission Level, Forest Reference Level, or accounting methodology explicitly excludes the specific emission sources (e.g., degradation from wood fuel harvesting) or activity classes (e.g., clean cooking/thermal energy) addressed by the activity; OR

ii. **Option 2: Attribution Agreement**: A formal statement, or Letter of No Objection from the relevant authority (e.g., National, sub-national or authorized authorised program administrator) confirming that the specific emission

reductions generated by the activity are attributed to the activity and will be deducted from (or not claimed by) the jurisdictional program to prevent double issuance.

3.2.8 | **Indoor Air Pollution (IAP) and Safety**

3.2.8.1 | Adequate evidence shall be supplied to demonstrate that IAP levels (PM 2.5 and CO) do not worsen compared to the baseline (See Parameter ICS 4).

3.2.8.2 | Furthermore, for activities where the technology moves from outdoor to indoor or where the activity technology reduces ventilation (e.g., changing from a stove with a chimney to an improved stove with no chimney), IAP levels, including PM 2.5 and carbon monoxide (CO) emissions, shall not worsen in the activity compared to the baseline. Standard ISO laboratory test reports (e.g., ISO 19867-1 emissions tiers) are sufficient to satisfy this requirement. Bespoke field emissions monitoring is not required unless the activity transitions users to a totally unventilated technology.

3.2.8.3 | To issue ADALYs, the activity developer may apply the Methodology to Estimate and Verify ADALYS from Clean Household Air. Activities may claim standard observational SDG 3.9.1 impact claims in their monitoring reports based on basic usage and indoor air quality safeguards.

3.2.9 | **Mandatory Compliance and Safeguards**

3.2.9.1 | **GS4GG Requirements:** The activity shall adhere to the Principles And Requirements, Safeguarding Principles and Requirements, and the Community Services Activity Requirements.

3.2.9.2 | **Regulatory Compliance:** The activity shall not undermine or conflict with any national, sub-national, or local regulations or guidance for thermal energy supply, devices, or fuel supply/use. (Parameter ICS 5).

3.2.9.3 | **Health and Safety:** Activities shall comply with health and safety requirements at both the organization level and for end-users, in line with Principle 3 of the Safeguarding Principles and Requirements.

3.2.9.4 | **Contractual Obligation:** The activity developer shall, by means of direct ownership, contractual agreement, or other such arrangement, establish access to all required monitoring data and supporting documentation.

3.3 | Entry into force

3.3.1 | The date of entry into force is 90 days from the publication date of this methodology.

4| NORMATIVE REFERENCES

4.1.1 | The following standards, methodologies, tools, and guidelines are normative references for the application of this methodology. Activity developers shall apply the latest valid version of these documents.

4.1.2 | References to CDM tools are valid until equivalent tools are published under Gold Standard (GS4GG) or the Article 6.4 Mechanism (A6.4)/Paris Agreement Crediting Mechanism (PACM).

4.1.2.1 | GS4GG Standards and Requirements

a. Principles And Requirements
b. Safeguarding Principles and Requirements
c. Community Services Activity Requirements

4.1.2.2 | GS4GG Methodologies, Standards, and Tools

a. Methodology Standard: Requirements for Additionality Demonstration
b. Methodology Standard: Requirements for Baseline Determination in Methodologies
c. Tool 05: Downward Adjustment Factor Determination
d. Tool 06 – Common Practice Analysis
e. Tool - Analysis of lock-in risk [Latest Approved Version]
f. Tool - Technical lifetime [Latest Approved Version]
g. Requirements and Guidelines: Cookstove Usage Rate Guidelines
h. Methodology: Methodology for Metered & Measured Energy Cooking Devices (Referenced for scope exclusion)
i. Tool 07 - Digital Stove Monitoring, Analysis and Reporting Tool (D-SMART)

4.1.2.3 | UNFCCC/A6.4 Tools and Standards:

a. A6.4-AMT-002: Investment analysis
b. A6.4 MEP012-A04: Methodological tool: Fraction of non-renewable biomass [Latest Approved Version]
c. A6.4-AMT-006: Determination of the technical lifetime of equipment
d. CDM Standard: Sampling and surveys for CDM project activities and programme of activities (or equivalent A6.4/PACM standard).

4.1.2.4 | Other Sources:

a. MoFuSS
b. ISO 19867-1: Clean cookstoves and clean cooking solutions -- Harmonized laboratory test protocols
c. Kitchen Performance Test (KPT) Protocol (Latest recognized version, e.g., Clean Cooking Alliance protocol).
d. Water Boiling Test (WBT) Protocol (Latest recognised version).

5| ACTIVITY BOUNDARY AND GHG SOURCES/SINKS

5.1 | Activity boundary

5.1.1 | The activity boundary encompasses all anthropogenic sources of GHGs that are under the control of the activity developer, are related to the activity, or are significantly affected by the activity. The activity developer shall clearly identify the physical boundary, target area, and fuel production and collection area following the definitions below.

5.1.1.1 | **Physical and Geographical Boundary:** The physical, geographical site(s) where the activity technologies/practices are implemented (e.g., households, institutional, commercial, or industrial facilities).

5.1.1.2 | **Fuel Production and Collection Area:** The boundary includes the areas associated with fuel sourcing and production:

a. **Woody Biomass:** Where the baseline or activity fuel is woody biomass (including charcoal), the boundary includes the area within which this woody biomass is grown and collected.

b. **Processed Fuels:** For activities using processed fuels, the boundary includes the baseline and activity fuel production facilities (e.g., charcoal kilns, plant oil processing) and any associated solid waste and effluent disposal or treatment facilities.

c. **New Biomass Feedstock:** In cases where the activity introduces the use of a new biomass feedstock, the boundary includes the area within which this new biomass is produced, collected, and supplied.

5.1.2 | **Upstream Emissions (Manufacturing/Transport):** The upstream cradle-to–gate emissions associated with the manufacture and transport of activity devices shall be accounted for as leakage.

5.1.3 | **Target Area:** The target area is the region(s) (e.g., village(s) or town(s)) where the considered baseline scenario(s) are deemed to be uniform. The target area provides an outer limit to the activity boundary in which the activity has a target population.

5.2 | GHG Sources

5.2.1 | Emissions from fuels can occur during fuel production, transport, and consumption (delivery of thermal energy).

5.2.2 | **Materiality and Simplification Rules:** The following rules shall apply regarding the inclusion of emission sources:

a. **Baseline Simplification:** Baseline emissions of CH_4 and N_2O may be omitted for simplification, provided this results in a conservative estimate of emission reductions (i.e., total baseline emissions are not overestimated).

b. **Activity Emission Completeness:** All activity emissions (CO_2, CH_4 and N_2O) shall be accounted for unless demonstrably negligible or not applicable to the individual activity.

c. **Fuel Transportation Emissions:** Activity emissions from the transportation of fuel/biomass (including long-distance and home delivery transport) shall be accounted for if the total transportation distance exceeds 200 km; otherwise, they may be neglected. If baseline fuel transportation emissions are included, activity fuel transportation emissions shall also be included, regardless of distance, to ensure consistency.

d. **Device Manufacturing/Transport** (**Embodied Emissions):** Indirect GHG emissions associated with the production, processing, and transport of inputs (cradle-to-gate embodied emissions of the activity devices) shall be accounted for exclusively as Leakage Emissions (See Section 9|).

5.3 | Baseline Emissions

5.3.1 | The following table details the GHGs included in, or excluded from, the baseline scenario(s).

Table 4. Sources of Baseline Emissions

SOURCE	DESCRIPTION	GAS	INCLUDED?	JUSTIFICATION
Delivery of thermal energy	Combustion of fuel in the baseline technology.	CO_2	Yes	Major source of emissions. Only CO_2 from the fNRB is included.
		CH_4	Yes	Important source of emissions from incomplete combustion. May be omitted if conservative (See 5.2.2 |).
		N_2O	Yes	Can be significant for some fuels. May be omitted if conservative (See 5.2.2 |).
Production of fuel, transport of fuel	Emissions are associated with production (e.g., charcoal production and transport of the baseline fuel.)	CO_2	Yes	Important lifecycle emissions. Included if the emission factor used incorporates these sources or if transport is significant.
		CH_4	Yes	
		N_2O	Yes	

5.4 | Activity Emissions

5.4.1 | The following table details the GHGs included in, or excluded from, the activity scenario(s).

Table 5. Sources of Activity Emissions

SOURCE	DESCRIPTION	GAS	INCLUDED?	JUSTIFICATION
Delivery of thermal energy	Combustion of fuel in the activity scenario, including continued use of baseline technologies.	CO_2	Yes	Major source of emissions. For biomass, only CO_2 from the fNRB is included (subject to fossil fuel applicability in Section 3.2.4.1 |.
		CH_4	Yes	Important source of emissions. Shall be included unless negligible (See Section 5.2.2 |).
		N_2O	Yes	
Production of fuel, transport of fuel	Emissions associated with the production and transport of the fuel used in the activity scenario.	CO_2	Yes	Important lifecycle emissions. Fuel transport emissions shall be included if the distance exceeds 200 km or if baseline transport emissions are included (See Section 5.2.2 |).
		CH_4	Yes	
		N_2O	Yes	

5.5 | Leakage emissions

5.5.1 | Leakage is the net change of GHG emissions occurring outside the activity boundary, attributable to the activity. The following table details the potential sources of leakage emissions that shall be assessed.

Table 6: Sources of Leakage Emissions

SOURCE	DESCRIPTION	GAS	INCLUDED?	JUSTIFICATION
Embodied Emissions (Upstream)	Cradle-to-gate emissions associated with the manufacturing and transport of the activity devices.	CO_{2e}	Yes	Mandatory Inclusion. Shall be accounted for using conservative defaults (See Section 9|).
Reuse of Baseline Equipment	The displaced baseline technologies are reused outside the activity boundary	CO_{2e}	Yes	Potential source of leakage. Assessed via monitoring or

	in place of lower emitting technology or with a higher intensity than would have occurred otherwise.			default factor (Section 9|).
Market Effects (Fuel Availability)	Non-participants who previously used lower emitting energy sources switch to the non-renewable biomass or fossil fuels saved by the project activity.	CO_{2e}	Yes	Potential source of leakage. Assessed via monitoring or default factor (Section 9|).
Market Effects (Technology Adoption)	Promotion and marketing of the new efficient technology stimulates its adoption by households who commonly used a technology with relatively lower emissions (adverse selection).	CO_{2e}	Yes	Potential source of market leakage. Assessed via monitoring or default factor (Section 9|).

6| DEMONSTRATION OF ADDITIONALITY

6.1 | Requirements

6.1.1 | The activity developer shall demonstrate that the activity would not have occurred in the absence of the incentives provided by the carbon revenues. The demonstration of additionality shall be conducted in accordance with the latest version of the *GS4GG Standard:* Requirements for Additionality Demonstration.

Note: The performance-based analysis pathway is not an eligible option under this methodology.

6.2 | Additionality Approach Selection

6.2.1 | The activity developer shall demonstrate additionality by conforming to the requirements of one of the options below:

a. **Positive List (Deemed Additionality):** The activity is deemed additional if it meets the geographic, scale, and policy criteria established in Annex -4|Methodology-Level Additionality and Barrier Analysis for Decentralized Thermal Energy Activities. This methodology-level analysis is valid for a period of five (5) years from the date of publication, justified by the multi-year update cycles of the underlying international surveys and academic data.

b. **Activity-Specific Assessment:** If the activity does not qualify for a Positive List of Annex -4| (e.g., large-scale activities, or activities operating in urban centers of middle-income countries), additionality shall be demonstrated through a detailed activity specific assessment as described in this section.

6.2.2 | All activities, regardless of the approach selected (Positive List or Activity-Specific Assessment), shall successfully complete the following mandatory analyses:

i. Regulatory Surplus Analysis (Section 6.3 |);

ii. Lock-In Risk Analysis (Section 6.4 |);

iii. Common Practice Analysis (Section 6.7 |).

6.2.3 | If the Activity-Specific Assessment pathway is used, the activity developer shall complete the Investment Analysis (Section 6.5 |) and/or Barrier Analysis (Section 6.6 |).

6.3 | Regulatory Surplus Analysis

6.3.1 | The activity developer shall demonstrate that the emission reductions achieved by the activity are regulatory surplus. This means the activity and its resulting emission reductions are not required by any existing laws, regulations, or mandates (legal requirements), or obligations within the host Country's jurisdiction.

6.3.2 | **Exemptions:** The activity developer may submit credible, authoritative, and up-to-date evidence (e.g., independent market surveys, government implementation reports) demonstrating that the *de facto* market conditions involve systemic non-compliance with the regulation (e.g. widespread continued use of traditional fuels despite formal restrictions), or that a government scheme lacks the operational funding, institutional capacity or enforcement mechanisms to achieve its targets independently of carbon finance. For high-income countries, all legal requirements shall be deemed to be fully enforced, and this *de facto* non-enforcement exemption shall not apply.

6.3.3 | The analysis shall verify that legal requirements do not:

a. Directly mandate the implementation of the mitigation activity.

b. Indirectly mandate the implementation of the mitigation activity by requiring a certain technological, performance, or management action, or by preventing alternative scenarios; or

c. Establish a support scheme (e.g., subsidy program) designed to achieve a quantitative target for the relevant technologies that would likely result in the same amount of emission reductions if the activity were not implemented.

6.3.4 | The assessment shall be conducted at the start of the 1st crediting period[1] and reassessed at each renewal of the crediting period (See Section 17|).

6.3.5 | **Host Country Eligibility (Article 6 Negative List Assessment):** The activity developer shall demonstrate that the mitigation activity type is not excluded by the Host Country from participating in carbon market mechanisms. The activity developer shall verify that the activity technology (e.g., biomass cookstove, clean fuel distribution) or measure is not included in any publicly available negative list or regulatory exclusion issued by the Host Country.

6.3.6 | **Demonstration of Compliance:** Compliance with this requirement shall be demonstrated through one of the following, as applicable, at the time of Validation (including PAA-Alignment Design Change validation for existing activities) and Crediting Period Renewal:

a. **Official List Review:** A citation of the Host Country's most recent official Article 6 policy framework, decrees, or public eligibility lists (e.g., a "Negative List" or "Ineligible Activity List") published by the Designated National Authority (DNA) or Article 6 Focal Point, confirming the activity is not excluded.

b. **Explicit Authorization:** Provision of a Letter of Authorization (LoA) or No Objection from the Host Country's DNA that explicitly authorizes the mitigation activity type or sector.

c. **Confirmation of No Exclusion (Default):** In the absence of a published negative list, positive list, or specific regulatory exclusion, the activity developer shall provide a formal declaration confirming that no official communication or regulation has been issued by the Host Country identifying the specific technology as ineligible for carbon crediting.

6.4 | Lock-In Risk Analysis

6.4.1 | The activity developer shall assess the risk that the activity may lead to a lock-in of GHG emissions, technologies, or carbon-intensive practices

[1] The VVB shall verify the status of the activity against the latest available eligibility criteria published by the Host Country's DNA at the time of Design Certification.

inconsistent with the achievement of the host Party's NDC or the long-term goals of the Paris Agreement.

6.4.2 | **Assessment Framework and Exemption:** The assessment shall follow GS4GG Methodology Tool - Analysis of lock-in risk.

a. For decentralized thermal energy technologies (e.g., household cookstoves, small water heaters, residential space heaters) where the technical or operational lifetime is demonstrably less than 10 years, it may be assumed that no significant lock-in risk exists, provided the activity aligns with the host country's sustainable energy strategies.

b. **2030 Sunset Clause:** The validity of the 10-year exemption is limited to activities submitted for Design Certification on or before 31 December 2030.

c. **Assessment:** Technologies with lifetimes exceeding 10 years and/or submitted for Design Certification after the sunset clause, shall undergo an assessment following GS4GG Methodology Tool – Lock in Risk Analysis.

6.4.3 | **Methodology-Level Determinations and Exemption Conditions:** Based on GS4GG Standard: Requirements for Additionality Demonstration, the following criteria apply to the applicable technologies in Table 3. Activities may be exempted from further activity-level lock-in risk assessment if they meet these specific conditions:

6.4.3.1 | **Full Exemption (Zero-Emission Technologies):** For solar technologies (e.g., Solar Cookers, Solar Water Heaters), although their lifespan may exceed 10 years, they pass the full Assessment as zero-emission technologies fully compatible with net-zero pathways.

6.4.3.2 | **Conditional Exemption:** For improved biomass cookstoves (ICS) and other decentralized thermal technologies (e.g., Heat Retention Cookers), lifespans are variable (typically 3-10 years). Exemption is granted only if the activity developer provides verifiable evidence (e.g., manufacturer specifications, standardized durability tests) demonstrating that the specific model(s) being deployed have a technical or operational lifetime of 10 years or less (See Parameter ICS 6); and

6.4.3.3 | **Conditional Exemption (High Risk Technologies - Fossil Fuels):** Fossil fuel technologies (e.g., LPG Stoves) (applicable only to grandfathered activities per Section 3.1.2 |). These technologies typically exceed the 10-year lifespan and present a high lock-in risk. Exemption from further assessment is granted only if the activity demonstrates BOTH of the following:

a. The host country's official Long-Term Low-Emission Development Strategy (LT-LEDS) or NDC explicitly identifies the specific fossil fuel (e.g., LPG) as a necessary transitional fuel strategy; AND

b. The activity relies only on existing infrastructure and does not finance or incentivize new, long-lived (>10 year) fossil-fuel infrastructure (e.g., import terminals, storage facilities).

6.4.4 | **Requirements for Full Lock-In Risk Assessment:** If the technology deployed does not meet the criteria for full or conditional exemption listed above in 6.4.3, the activity developer shall conduct a Lock-In Risk Assessment following GS4GG Methodology Tool – Lock in Risk Analysis.

6.5 | Investment/Financial Analysis

6.5.1 | The activity developer shall demonstrate that the mitigation activity is not financially viable without carbon credit revenue (Investment Analysis) OR that implementation would be prevented by significant barriers that carbon revenue helps overcome (Barrier Analysis).

6.5.2 | **Selection of Analysis Type:** The appropriate analysis type depends on the scale and context of the activity:

6.5.2.1 | **Investment Analysis:** This approach shall be used for: i. Large-scale activities. ii. Activities implemented in industrial or large commercial/institutional facilities where standard financial investment appraisal is the norm.

6.5.2.2 | **Barrier Analysis:** This approach may be used for: i. Micro-scale and Small-scale activities. ii. Activities implemented at individual households or small entities (e.g., schools, small enterprises) that typically do not have access to commercial or public third-party finance, or where non-financial barriers are the primary deterrent.

6.5.2.3 | **Combined Analysis:** For Large-scale activities, Barrier Analysis may only be used in combination with Investment Analysis, with justification provided as to why the investment analysis alone is insufficient.

6.5.3 | **Requirements for Investment Analysis:** If Investment Analysis is selected, the activity developer shall conduct a Simple Cost Analysis, Benchmark Analysis, or Investment Comparison Analysis in conformity with the requirements of the A6.4-AMT-002: Investment analysis. The analysis shall demonstrate that:

a. The activity is not financially viable (e.g., fails to meet the required benchmark or is less attractive than alternatives) without carbon credit revenues; and

b. With carbon credit revenues, the activity becomes financially viable or the most attractive option.

6.6 | Barrier Analysis (optional alternative):

6.6.1 | If a standard investment analysis cannot be applied, the activity developer may undertake a barrier analysis to demonstrate that significant barriers (e.g. technological, institutional, cultural or other barriers) would prevent

the implementation of the clean cooking activity in the absence of carbon finance. At least one barrier shall be substantiated with verifiable evidence.

6.7 | Common Practice Analysis:

6.7.1 | All activities, including those on the Positive List, shall evaluate common practice in accordance with the GS4GG Methodology Tool: Common Practice Analysis (MT400-06).

6.7.2 | The activity developer shall assess the market penetration of equivalent technologies (i.e., those providing a similar or better level of service with comparable or improved efficiency and fuel types) in the applicable geographic area, applying the following mandatory parameters:

a. **Assessment Approach and Indicator (P):** The Stock-Based Approach (assessing cumulative diffusion) shall be applied using a Count-based indicator (number of households/facilities).

b. **Data Vintage:** Data utilized shall be the most recent authoritative data available and shall not be older than five years prior to the submission of the PDD for Validation.

c. **Applicable Geographical Area (AGA):** The AGA shall be the Host Country. Sub-national or district-level AGA assessment (e.g., defining the boundary at the district or similar administrative level) is permissible if justified by localized market conditions or infrastructure divides between urban, peri-urban, and rural areas or if the activity developer can justify that the target demographic's market conditions, access, and affordability differ materially from national averages.

d. **Target Market Size** (P_{all})**:** Shall be defined strictly on technical applicability and regulatory boundaries. Socioeconomic segmentation is permitted if affordability is a rigorously justified primary structural barrier defining the accessible market.

e. **Similar Activities (P_{sim}) & Attribute Matrix:** Similarity shall be defined using the Attribute Matrix below. Factors related to scale (capacity/output), market conditions, policy incentives, or investment costs shall not be used as differentiating attributes. Activities substantially supported by international climate finance, ODA, or previously registered carbon market schemes shall be explicitly excluded from P_{sim}.

Table 7. Attribute Matrix for Improved Biomass Efficiency

Attribute	Description	Required for Similarity (Yes/No)
Primary Energy Source	Biomass (Wood, Charcoal, or Agri-residues).	Yes

Application	Used as a primary device for cooking/heating.	Yes
Efficiency Requirement	Meets or exceeds the minimum TPDDTEC requirement (e.g., Rated thermal efficiency ≥ 25%) or applicable local Minimum Energy Performance Standards (MEPS). Where the activity device is permitted below the minimum thresholds with justification, comparisons shall be made against technologies of comparable efficiency.	Yes
Exclusion of Carbon Finance	Technologies distributed, subsidized, or maintained via voluntary, or compliance carbon market mechanisms shall be explicitly excluded from the count when calculating the common practice penetration rate.	Yes
Specific Technology Design	e.g., Rocket stove, gasifier, heat retention cooker.	No

Table 8. Attribute Matrix Solar Thermal Technologies

Attribute	Description	Required for Similarity (Yes/No)
Primary Energy Source	Solar radiation.	Yes
Technology Principle	Solar thermal energy capture and utilization.	Yes
Application	Water heating, cooking, drying, or space heating.	Yes
Exclusion of Carbon Finance	Technologies distributed, subsidized, or maintained via voluntary, or compliance carbon market mechanisms shall be explicitly excluded from the count when calculating the common practice penetration rate.	Yes
Specific Technology Design	e.g., Flat plate vs. evacuated tube; Parabolic vs. box cooker.	No

6.7.3 | **Determination of the Common Practice Threshold (F_{max}):**

6.7.3.1 | Using the Stock-Based Approach, a uniform Common Practice Threshold (F_{max}) of 25% shall be applied across all regions and technology types.

6.7.3.2 | If the calculated Common Practice Factor $F = \frac{P_{sim}}{P_{all}}$ is ≥ F_{max}, the activity is common practice and not additional.

6.8 | Ongoing Financial Need

6.8.1 | At renewal of the crediting period, the additionality of the activity shall be reassessed in line with Gold Standard requirements.

6.8.2 | **Positive List Exemption:** Activities that qualified for and remain eligible under a recognized GS4GG Positive List (Deemed Additionality) are exempt from the Ongoing Financial Need (OFN) demonstration at crediting period renewal.

6.8.3 | **Demonstration of OFN[2]:** For all other activities (those that transition from earlier versions or apply Activity-Specific Assessments), the developer shall demonstrate Ongoing Financial Need (OFN). This involves providing evidence (e.g. an updated financial analysis or funding assessment) that the activity still requires income from carbon credits to remain operational and sustainable in the renewed period.

7| BASELINE SCENARIO

7.1 | Baseline Determination (Stepwise Approach)

7.1.1 | The crediting baseline emissions (BE_y), shall be determined following the stepwise approach mandated by the Methodology Standard: Requirements for Baseline Determination in Methodologies:

a. Step 1: Selection and Justification of the Baseline Approach (Section 7.2 |).
b. Step 2: Application of the selected approach prior to downward adjustment (Section 7.3 |).
c. Step 3: Application of the Downward Adjustment (Uncertainty and Ambition) (Section 7.4 |).
d. Step 4: Identification of a conservative Business-as-Usual (BAU) baseline (Section 7.5 |).

[2] Impact of Methodology Updates: Reductions in crediting volume resulting directly from mandatory methodology updates (e.g., the application of the Downward Adjustment Factor or revised fNRB rules) shall be recognized as a valid quantitative justification for demonstrating Ongoing Financial Need.

e. Step 5: Comparison and selection of the final Crediting Baseline (BE_y) (Section 7.6 |).

7.2 | Step 1: Selection of and Justification of the Baseline Approach

7.2.1 | This methodology utilizes approach (c) from paragraph 5.6.2 of the Methodology Standard: Requirements for Baseline Determination in Methodologies: An approach based on existing actual or historical emissions, adjusted downwards.

7.2.2 | The selection of approach (c) is justified as follows:

a. **Appropriateness to Activity Context:** Emissions savings from decentralized thermal energy activities are highly dependent on site-specific factors (e.g., user behaviour, fuel characteristics, climate). Direct measurement via field tests (e.g., KPTs) is required to accurately capture the difference between historical consumption patterns and activity performance.
b. **Ensuring Conservativeness:** The calculated emission reductions are adjusted downwards by:
    i. Applying statistical conservativeness (e.g., 90/10 rule) to account for measurement and sampling uncertainty.
    ii. Applying the Downward Adjustment Factor (DAF) to encourage ambition over time.

7.3 | Step 2: Application of the Selected Approach (Prior to Downward Adjustment)

7.3.1 | Identification and Justification of the Baseline Scenario

7.3.1.1 | The baseline scenario is defined as the existing technology/practice use and fuel consumption patterns for the type of service provided by the activity technology in the target population.

7.3.1.2 | The identification and description of the baseline scenario shall be informed by an ex-ante Baseline Scenario Survey (See Parameter ICS 7).The selection shall account for all technologies that may be replaced by the activity, including the presence and usage practices of multiple baseline technologies ("stove-stacking"). It is not legitimate to compare the activity only to the most inefficient technology being used.

7.3.1.3 | Activity developers shall identify distinct baseline scenarios (b) when the activity targets populations with significantly different fuel consumption patterns or baseline technologies (e.g., rural wood users vs. urban charcoal users).

7.3.1.4 | When the activity includes different activity technology types (p), the developer shall analyse whether these technologies relate to different baseline scenarios. Multiple activity scenarios can be credited against the same baseline scenario if applicable.

7.3.2 | **Consistency Check between Baseline Scenario and Activity Households:** The activity developer shall verify that the fuel mix and household characteristics determined for the baseline scenario (via ICS 7) remain representative of the actual households recruited into the activity.

7.3.2.1 | **Standardized Retrospective Survey:** This assessment shall be carried out using retrospective questions asked of activity households during the first usage survey conducted for each household after its inclusion in the activity. The survey shall utilize standardized retrospective questions encompassing the following minimum parameters and the recall period for these questions shall be standardized across the activity as "the typical cooking habits during the 30 days prior to receiving the activity stove.

a. Number of individuals utilizing the cooking/heating service (Household Size).

b. Primary baseline fuel type.

c. Secondary baseline fuel type(s).

7.3.2.2 | **Assessment of Material Discrepancy:** A material discrepancy occurs if the actual field population presents a "cleaner" or smaller emitting profile than the ex-ante assumptions, defined as:

a. The actual proportion of cooking events utilizing the primary high-emitting fuel type is lower than the baseline scenario estimate, where the difference results in higher ex-ante baseline emissions; AND/OR

b. The actual average household size is smaller than the baseline scenario estimate.

7.3.2.3 | **Resolutions:** Where a material discrepancy occurs, the activity developer shall resolve it by applying the following threshold-based approach:

a. **Cluster Separations:** Activity developers may utilize cluster separations (e.g., stratifying the population strictly by primary single-fuel users vs. mixed-fuel users) to resolve apparent discrepancies and improve demographic matching prior to applying adjustments. However, any cluster separations utilized shall be based on objective stratifications explicitly defined ex-ante in the registered PDD or Baseline Scenario Survey.

b. **Deviations below the Validity Threshold (≤ 20%):** If the absolute deviation between the baseline estimate and the actual deployed population is 20% or less, the activity developer shall apply a conservative adjustment to the baseline emission calculations. The calculations shall be adjusted to match the empirically observed, lower-emitting household profile to prevent over-crediting.

c. **Deviations exceeding the Validity Threshold (> 20%):** If the deviation exceeds 20%, the shift is deemed a fundamental

divergence from the target demographic. The original Baseline Scenario is statistically invalid for that specific cohort, and the activity developer shall formally redefine the baseline scenario via a new Baseline KPT and survey.

d. **Prohibition on Exclusion:** Activity developers shall not arbitrarily exclude non-conforming, lower-emitting households from the monitoring sample solely to artificially force compliance with an aggressively high baseline.

7.3.3 | **Baseline Duration and Updates**

7.3.3.1 | **Non-industrial Applications:** For households, residential, institutional, and commercial applications, the baseline is considered fixed for the duration of the 5-year crediting period. It shall be reassessed at the renewal of the crediting period (See Section 17|).In the event of a contradiction regarding baseline reassessment schedules, the requirements of this methodology shall explicitly supersede the exemptions provided in the overarching Community Services Activity Requirements.

7.3.3.2 | **Industrial Applications:** For industrial applications, a fixed baseline can only be considered for the expected remaining lifetime of the baseline devices, as determined by the A6.4-AMT-006: Determination of the technical lifetime of equipment & GS4GG Tool – Technical lifetime analysis. The baseline shall be reassessed if emission reductions are claimed beyond this lifetime.

7.3.4 | **Cross-Effects**: In activities targeting multiple distributed technologies (e.g., improved cookstoves and safe water supply), cross-effects shall be accounted for. The baseline scenario shall be defined such that baseline fuel use is divided appropriately between the technologies without double counting.

7.3.5 | **Suppressed Demand Assessment**

7.3.5.1 | The methodology allows for the baseline scenario to account for suppressed demand if the pre-activity energy consumption is below the level required to meet basic human needs due to constraints such as poverty.

a. **Limitations:** Large-scale activities and commercial or industrial premises are not allowed to claim a suppressed demand baseline.

b. **Demonstration:** The activity developer shall provide verifiable evidence that the target population is deprived of a humanely acceptable benchmark regarding energy access for cooking. Evidence may include official poverty statistics, baseline surveys. See Parameter ICS 7) documenting unmet basic cooking needs, or credible published literature for the activity area. If demonstrated, the baseline consumption is set at the Minimum Service Level (MSL) (ICS 14, 15).

7.3.6 | Overview of Intervention Types and Baseline Approaches

7.3.6.1 | Activities are categorized based on the intervention strategy and the baseline approach used to determine the baseline (Section 7.3.6).

a. **Type A: Efficiency Improvement (KPT Baseline):** Identical baseline and activity fuels; efficiency gains only. Baseline determined via B-KPT (Option A).

b. **Type B: Efficiency Improvement (Default/MSL Baseline):** Identical baseline and activity fuels (woody biomass); efficiency gains only. Baseline determined via Default (Option B) or MSL (Option C). (Micro- or Small-scale only).

c. **Type C: Fuel Switch (KPT Baseline):** Different baseline and activity fuels; fuel switch and/or efficiency gains. Baseline determined via B-KPT (Option A).

7.3.7 | Determination of Mean Baseline Fuel Consumption ($P_{b,mean}$)

7.3.7.1 | The Mean Baseline Fuel Consumption ($P_{b,mean}$) per unit (e.g., household, facility per day) shall be determined using one of the following options:

a. **OPTION A:** Historical Consumption (B-KPT): $P_{b,mean}$ is determined ex-ante via a statistically representative B-KPT (ICS 15). (Corresponds to Type A and C).

b. **OPTION B:** Default Consumption: Applicable only to Micro- or Small-scale activities using woody biomass. $P_{b,mean}$ is based on the conservative default (ICS 15). (Corresponds to Type B).

c. **OPTION C:** Suppressed Demand (MSL): $P_{b,mean}$ is set equal to the Minimum Service Level (P_{MSL}).

7.3.7.2 | Household Size Integration: Because KPT results ($P_{b,mean}$) are typically measured in fuel mass per household per day, but methodological caps are evaluated in tonnes per person per year, the average baseline household size (HN_b) shall be explicitly applied as the denominator to convert household-level fuel consumption into per-capita fuel consumption for verification against the caps $P_{b,person,yr} = (P_{b,mean} \times 365)/HN_b$, where $P_{b,mean}$ is the measured baseline fuel consumption in tonnes/household/day, and HN_b is the average baseline household size).

7.3.7.3 | The determined value of $P_{b,mean}$ is fixed for the 5-year crediting period, except for industrial applications where it is fixed only for the remaining lifetime of the baseline equipment (as determined by A6.4-AMT-006).

7.3.8 | Calculation of Unadjusted Baseline Emissions ($BE_{unadj,y}$)

7.3.8.1 | The Unadjusted Baseline Emissions ($BE_{unadj,y}$) are calculated using the mean baseline fuel consumption ($P_{b,mean}$), prior to the downward adjustments.

$$BE_{unadj,y} = \sum_{b,p}\left(N_{b,p,y} \times U_{p,y} \times P_{b,mean} \times NCV_{b,fuel} \times (EF_{b,f,CO2} \times fNRB_{b,y} + EF_{b,f,non-CO2})\right) \quad \text{Eq. 1}$$

Where:

$BE_{unadj,y}$	=	Unadjusted baseline emission in year y (tCO_2e/yr)
b,p	=	Sum over all relevant baseline b/activity p scenario pairs
$N_{b,p,y}$	=	Number of activity technology-days for baseline b/activity p pair (days) in year y
$U_{p,y}$	=	Cumulative Usage rate for technologies in activity scenario p in year y (fraction)
$P_{b,mean}$	=	Mean quantity of fuel consumed in baseline scenario b, tonnes/day
$NCV_{b,fuel}$	=	Net calorific value of the baseline fuel(s) (TJ/mass or volume units)
$EF_{b,f,CO2}$	=	CO_2 emission factor from use of fuel *f* (tCO_2/TJ)
$fNRB_{b,y}$	=	Fraction of non-renewable biomass (Baseline) (See ICS 20). Note: fNRB is only applied when the fuel is biomass. When the fuel is fossil fuel, fNRB = 1.
$EF_{b,f,nonCO2}$	=	Non-CO_2 emission factor of baseline fuel *f* (tCO_2e/TJ).

7.4 | Step 3: Application of the Downward Adjustment

7.4.1 | **Adjustment for Uncertainty** ($P_{b,adj}$): The baseline fuel consumption shall be adjusted downwards to account for statistical uncertainty before applying the DAF.

7.4.2 | **OPTION A: Historical Consumption (B-KPT)**: The uncertainty associated with associated with the B-KPT sampling results ($P_{b,mean}$) shall be addressed using the statistical rules defined below. The required statistical precision for the B-KPT sampling results ($P_{b,mean}$) shall meet a confidence level and a precision of 10% (90/10). The precision requirements shall apply whether paired independent or single sampling approaches are used. Paired sampling may be used to reduce the required sample size to achieve the 90/10 requirement.

7.4.2.1 | **Statistical Adjustment:** The statistically adjusted value ($P_{b,stat}$) shall be determined as follows:

a. If the 90/10 Rule is met, the mean value for fuel consumption shall be used.

$$P_{b,stat} = P_{b,mean} \quad \text{Eq.2}$$

Where:

$P_{b,stat}$ = Statistically adjusted mean quantity of fuel consumed in baseline scenario b (tonnes/household/day)

$P_{b,mean}$ = Measured mean quantity of fuel consumed in baseline scenario b (tonnes/household/day)

b. If the (90/10 Rule is NOT met, activity developer may undertake additional sampling to achieve precision. Activities undergoing mid-crediting period PAA validation are explicitly permitted to conduct supplementary B-KPT sampling to achieve this. If precision remains unmet, the lower bound of the one-sided 90% confidence interval of the fuel consumption shall be used.

$$P_{b,stat} = P_{b,LB90} \quad \text{Eq.3}$$

Where:

$P_{b,stat}$ = Statistically adjusted mean quantity of fuel consumed in baseline scenario b (tonnes/household/day)

$P_{b,LB90}$ = Lower Bound of the one-sided 90% confidence interval of the measured baseline fuel consumption (tonnes/household/day)

7.4.2.2 | **Capping (Conservativeness):** To prevent the over-crediting of historical inefficiencies or statistical outliers, the statistically adjusted baseline consumption, $P_{b,stat}$ shall be capped if it exceeds established thresholds (See ICS 16).

7.4.2.3 | **Threshold and Cap Values:**

a. **Primary Fuelwood Users** (≥75% of cooking events with wood):

a. Threshold value: 0.75 tonnes/person/year of air-dried wood (or equivalent energy). If exceeded, substantiation by independent third-party studies is required.

b. Cap value (P_{CAP}): 1.25 tonnes/person/year of fuelwood (or equivalent energy).

b. **Primary Charcoal Users or Mixed Baselines:**

i. Threshold value: 0.20 tonnes/person/year of charcoal (or equivalent energy).

ii. Cap Value (P_{CAP}): 0.40 tonnes/person/year of charcoal (or equivalent energy).

7.4.2.4 | **Justification Requirement:** If $P_{b,stat}$ exceeds the Threshold, the activity developer shall provide robust, context-specific justification in the PDD/VPA-DD explaining why a higher baseline is realistic.

7.4.2.5 | The final adjusted baseline fuel consumption ($P_{b,adj}$) shall be determined by taking the lesser value between the statistically adjusted field

measurement ($P_{b,stat}$) and the absolute maximum methodological cap (P_{CAP}), converting the per-capita cap to a daily household equivalent.

$$P_{b,adj} = MIN\left[P_{b,stat}, \left(P_{CAP} \times \frac{HN_b}{365}\right)\right] \quad \text{Eq.4}$$

Where:

$P_{b,adj}$	=	Final uncertainty-adjusted mean quantity of fuel consumed in baseline scenario $\boldsymbol{b}$ (tonnes/household/day)
$P_{b,stat}$	=	Statistically adjusted mean quantity of fuel consumed in baseline scenario $\boldsymbol{b}$ (tonnes/household/day)
P_{CAP}	=	Maximum allowable baseline fuel consumption cap for the respective fuel (tonnes/person/year)
HN_b	=	Number of individuals per household in the baseline scenario (persons)
365	=	Number of days in a year (days/year)

7.4.3 | OPTION B: Default Consumption

7.4.3.1 | No statistical adjustment is required as the value is a pre-calculated conservative default.

$$P_{b,adj} = P_{b,mean} \quad \text{Eq.5}$$

Where:

$P_{b,adj}$	=	Final uncertainty-adjusted mean quantity of fuel consumed in baseline scenario b (tonnes/household/day)
$P_{b,mean}$	=	Default mean quantity of fuel consumed in baseline scenario b (tonnes/household/day)

7.4.4 | OPTION C: Suppressed Demand (MSL)

7.4.4.1 | A mandatory 5% deduction shall be applied to the Minimum Service Level (MSL) to ensure conservativeness.

$$P_{b,adj} = P_{MSL,hh} \times 0.95 \quad \text{Eq.6}$$

Where:

$P_{b,adj}$	=	Final uncertainty-adjusted mean quantity of fuel consumed in baseline scenario b (tonnes/household/day)
$P_{MSL,hh}$	=	Household Minimum Service Level fuel consumption (tonnes/household/day)
0.95	=	Mandatory 5% conservativeness discount factor (fraction)

7.4.4.2 | **Minimum Service Level (MSL) Calculation:** The household MSL ($P_{MSL,hh}$) is calculated as:

$$P_{MSL,hh} = \frac{P_{MSL,capita} \times HN_b}{365} \qquad \text{Eq.7}$$

Where:

$P_{MSL,hh}$	=	Household Minimum Service Level fuel consumption (tonnes/household/day)
$P_{MSL,capita}$	=	Per capita MSL default value from Parameter ICS 14 (tonnes/person/year)
HN_b	=	Number of individuals per household in the baseline scenario (persons)
365	=	Number of days in a year (days/year)

7.4.5 | **Calculation of Uncertainty-Adjusted Baseline Emissions ($BE_{unc,y}$)**

7.4.5.1 | The Baseline Emissions adjusted for uncertainty ($BE_{unc,y}$) are calculated by replacing $P_{b,mean}$ with the fully capped and adjusted $P_{b,adj}$.

$$BE_{unc,y} = \sum_{b,p}\left(N_{b,p,y} \times U_{p,y} \times P_{b,adj} \times NCV_{b,fuel} \times (EF_{b,f,CO2} \times fNRB_{b,y} + EF_{b,f,non-CO2})\right) \qquad \text{Eq. 8}$$

Where:

$BE_{unc,y}$	=	Uncertainty-adjusted baseline emissions in year (tCO_2e/yr)
b,p	=	Sum over all relevant baseline b/activity p scenario pairs
$N_{b,p,y}$	=	Number of activity technology-days for baseline b/activity p pair (days) in year y
$U_{p,y}$	=	Cumulative Usage rate for technologies in activity scenario p in year y (fraction)
$P_{b,adj}$	=	Final uncertainty-adjusted mean quantity of fuel consumed in baseline scenario b (tonnes/household/day)
$NCV_{b,fuel}$	=	Net calorific value of the baseline fuel(s) (TJ/mass or volume units)
$EF_{b,f,CO2}$	=	CO_2 emission factor from use of fuel *f* (tCO_2/TJ)
$fNRB_{b,y}$	=	Fraction of non-renewable biomass (Baseline) (See Parameter ICS 20). Note: fNRB is only applied when the fuel is biomass. When the fuel is fossil fuel, fNRB = 1.
$EF_{b,f,nonCO2}$	=	Non-CO_2 emission factor of baseline fuel *f* (tCO_2e/TJ).

7.4.6 | **Adjustment For Ambition (DAF)**

7.4.6.1 | The Downward Adjustment Factor ($DAF_{NetZero}$): To encourage ambition over time and align the activity with the host country's long-term decarbonization pathway, the $DAF_{NetZero}$ shall be applied to the Uncertainty-Adjusted Baseline Emissions. This factor remains fixed and shall be sourced from the GS4GG Tool 05 corresponding to the host country and the calendar year of the monitoring period (Year y).

7.4.6.2 | Calculation of Downward Adjusted Baseline Emissions ($BE_{adj,y}$)

$$BE_{adj,y} = BE_{unc,y} \times (1 - DAF_{NetZero}) \qquad \text{Eq. 9}$$

Where:

$BE_{adj,y}$	=	Downward Adjusted Baseline Emissions in year y (tCO_2e/yr)
$BE_{unc,y}$	=	Uncertainty-adjusted baseline emissions in year y (tCO_2e/yr)
$DAF_{NetZero}$	=	Downward Adjustment Factor for the host country and corresponding vintage, sourced from the GS4GG Tool 05 (fraction)

7.5 | Step 4: Identification and Calculation of the Conservative BAU Scenario

7.5.1 | The conservative Business-as-Usual (BAU) scenario accounts for uncertainty but excludes the Adjustment for Ambition (DAF).

$$BAU_y = BE_{unc,y} \qquad \text{Eq. 10}$$

7.6 | Step 5: Comparison and Selection of the Crediting Baseline (BE_y)

7.6.1 | The final Crediting Baseline (BE_y) shall be the lower value between the Downward Adjusted Emission Reductions ($BE_{adj,y}$) and the Conservative BAU (BAU_y).

$$BE_y = MIN(BE_{adj,y}, BAU_y) \qquad \text{Eq. 11}$$

Where:

BE_y	=	Crediting Baseline Emissions in year y (tCO_2e/yr)
$BE_{adj,y}$	=	Downward Adjusted Baseline Emissions in year y (tCO_2e/yr)
BAU_y	=	Conservative Business-as-Usual emissions in year y (tCO_2e/yr)

7.7 | Quantification of the Difference between BAU and Crediting Baseline

7.7.1 | The difference between the Conservative BAU emissions (BAU_y) and the final Crediting Baseline Emissions (BE_y) shall be quantified and reported transparently in the monitoring report. The activity developer shall sequentially report the Unadjusted Emissions ($BE_{unadj,y}$), the Uncertainty-Adjusted Emissions ($BE_{unc,y}$), $BE_{adj,y}$, $BAU_{y,}$and Crediting Baseline (BE_y),

7.7.2 | The difference represents the emissions excluded from crediting due to the application of the DAF for ambition.

$$\Delta_y = BAU_y - BE_y > 0 \qquad \text{Eq. 12}$$

Where:

Δ_y	=	Emissions excluded from the crediting baseline due to ambition adjustment (DAF) in year y
BAU_y	=	Conservative Business-as-Usual emissions in year y
BE_y	=	Crediting Baseline Emissions in year y

8| ACTIVITY EMISSIONS

8.1 | Identification of the Activity Scenario

8.1.1 | The activity scenario (project scenario) is defined by the adoption of the activity technology and the resulting fuel consumption patterns of the end-users within the target population.

8.1.2 | When different technologies are included in an activity, the activity developer shall analyse whether multiple activity scenarios (p) shall be identified.

8.1.3 | Activity technologies with similar design and performance characteristics may be included under a single activity scenario. Similarity is defined as technologies based on the same fundamental technology (e.g., combustion principle) whose respective thermal efficiencies or specific consumptions do not differ by more than +/-5% in absolute terms from the design implemented most frequently.

8.1.4 | Technologies with significantly different performance characteristics (differing by more than +/-5%) shall be treated as independent activity scenarios and monitored and calculated separately.

8.2 | Calculation of Activity Emissions

8.2.1 | Activity emissions (AE_y) are all anthropogenic emissions of GHGs occurring within the activity boundary that are attributable to the activity.

8.2.2 | Determination of Mean Activity Fuel Consumption ($P_{p,mean}$)

8.2.2.1 | The mean activity fuel consumption ($P_{p,mean}$) per unit shall be determined via a statistically representative Activity KPT (P-KPT) (ICS 21).

8.2.2.2 | **Stratification and Weighting:** To account for potential performance degradation over time, the P-KPT sampling shall be stratified across technology ages (cohorts) to ensure the results are representative of the average performance of the operational stove population. The overall $P_{p,mean}$ shall be calculated as the weighted average of the fuel consumption across the sampled age cohorts, weighted by the proportion of the total operational stove population within each respective age cohort.

8.2.2.3 | **Timing and Seasonality of P-KPTs:** P-KPTs shall be conducted biennially (every two years). The P-KPT may be conducted at any representative time within the monitoring period to adequately capture seasonal variations. If seasonal variations (e.g., wet vs. dry seasons) materially impact fuel use, the KPT sampling shall be staggered or mathematically weighted to accurately account for both seasons. To ensure precise demographic and weather matching, the initial Project KPT may be conducted concurrently with the Baseline KPT (B-KPT) prior to the first verification.

8.2.2.4 | **Internalization of Rebound Effects and Stove Stacking**: Activity emissions shall account for the total relevant fuel consumed by the end-user to meet the energy needs covered by the activity scope. This includes fuel used to compensate for lost co-benefits (e.g., space heating) of the baseline technology (the "rebound effect").

a. **Stacking with Baseline Devices:** The P-KPT shall physically measure the fuel used in the activity technology AND any continued use of the baseline technology operating in parallel. Because the total fuel consumed by stacked baseline devices is fully captured and integrated into the physical P-KPT measurement, the stove stacking fraction calculated from Usage Surveys (Parameter ICS 23) shall NOT be applied as a secondary mathematical discount factor in the emission reduction equations, preventing double-penalizing the activity.

b. **Stacking with Non-Activity Improved Devices:** If the household has acquired a new improved cooking device (not attributable to the project activity) since the baseline was established, the energy consumed by this non-activity device shall be measured or conservatively estimated. To prevent free-riding and double-claiming of emission reductions generated by external interventions, the baseline fuel equivalent of the energy consumed by the non-activity device shall be mathematically added to the Activity Emissions (AE_y) for that household, OR used to proportionally adjust the household's Baseline Emissions (BE_y) downward. It shall not simply be excluded

and treated as a zero-emission event attributable to the project activity.

8.2.2.5 | These effects are internal activity effects, not external leakage. They shall be fully captured during activity monitoring (e.g., P-KPT) and internalized in the calculation of Activity Emissions. Failure to adequately monitor and internalize these effects shall result in the application of a penalty under Leakage (See Section b, Option 2).

8.2.3 | **Calculation of Unadjusted Activity Emissions** $AE_{unadj,y}$

8.2.3.1 | The unadjusted activity emissions ($AE_{unadj,y}$) are calculated using the mean activity fuel consumption ($P_{p,mean}$), prior to the adjustment for uncertainty.

$$AE_{unadj,y} = \sum_{b,p}\left(N_{b,p,y} \times U_{p,y} \times P_{p,mean} \times NCV_{p,fuel} \times (EF_{p,f,CO2} \times fNRB_{adj,p,y} + EF_{p,f,non-CO2})\right) \quad \text{Eq. 13}$$

Where:

$AE_{unadj,y}$	=	Unadjusted activity emission in year y (tCO_2e/yr)
b,p	=	Sum over all relevant baseline b/activity p scenario pairs
$N_{b,p,y}$	=	Number of activity technology-days for baseline b/activity p pair (days) in year y
$U_{p,y}$	=	Cumulative Usage rate for technologies in activity scenario p in year y (fraction)
$P_{p,mean}$	=	Measured mean quantity of fuel consumed in activity scenario p, tonnes/household/day
$NCV_{p,fuel}$	=	Net calorific value of the activity fuel(s) (TJ/mass or volume units)
$EF_{p,f,CO2}$	=	CO_2 emission factor from use of activity fuel f (tCO_2/TJ). Note: If the activity introduces or utilizes fossil fuels, the baseline emission factor $EF_{b,f,CO2}$ shall be used in place of the activity emission factor ($EF_{p,f,CO2}$)
$fNRB_{adj,b,y}$	=	Adjusted Fraction of non-renewable biomass (Baseline) (See ICS 20). Note: If the activity scenario involves biomass, $fNRB_{adj,b,y}$ is equal to the baseline $fNRB_{b,y}$; If the activity scenario involves fossil fuels, $fNRB_{adj,b,y}$ = 1
$EF_{p,f,nonCO2}$	=	Non- CO_2 emission factor of activity fuel f (tCO_2e/TJ).

8.2.4 | **Adjustment for Uncertainty ($P_{p,adj}$).**

8.2.4.1 | The statistical uncertainty adjustments associated with P- KPT sampling results ($P_{p,mean}$) shall be addressed by applying a 90% confidence level and 10% margin of error target (90/10 Rule) for all Efficiency Improvement for Efficiency Improvement (Types A & B) or 90/10 rule and

Fuel Switch (Type C) projects. The adjusted activity Fuel Consumption ($P_{p,adj}$) is determined as follows:

a. If the 90/10 rule is met, the mean value shall be used:

$$P_{p,adj} = P_{p,mean} \qquad \text{Eq. 14}$$

Where:

$P_{p,adj}$ = Statistically adjusted mean quantity of fuel consumed in activity scenario p (tonnes/household/day)

$P_{p,mean}$ = Measured mean quantity of fuel consumed in activity scenario p (tonnes/household/day)

b. If the 90/10 rule is NOT met, the activity developer may conduct supplementary sampling. If precision remains unmet, the Upper Bound of the one-sided 90% confidence interval shall be used to guarantee conservativeness (preventing under-estimation of activity emissions):

$$P_{p,adj} = P_{p,UB90} \qquad \text{Eq. 15}$$

Where:

$P_{p,adj}$ = Statistically adjusted mean quantity of fuel consumed in activity scenario p (tonnes/household/day)

$P_{p,UB90}$ = Upper Bound of the one-sided 90% confidence interval of the measured activity fuel consumption (tonnes/household/day)

8.2.5 | Calculation of Final Activity Emissions (AE_y)

8.2.5.1 | The final Activity Emissions (AE_y) are calculated by replacing $P_{p,mean}$ with $P_{p,adj}$ in Eq. 13.

$$AE_{,y} = \sum_{b,p}\left(N_{b,p,y} \times U_{p,y} \times P_{p,adj} \times NCV_{p,fuel} \times (EF_{p,f,CO2} \times fNRB_{adj,p,y} + EF_{p,f,non-CO2})\right) \qquad \text{Eq. 16}$$

Where:

$AE_{,y}$ = Final statistically adjusted Activity Emissions in year y (tCO_2e/yr)

b,p = Sum over all relevant baseline b/activity p scenario pairs

$N_{b,p,y}$ = Number of activity technology-days for baseline b/activity p pair (days) in year y

$U_{p,y}$ = Cumulative Usage rate for technologies in activity scenario p in year y (fraction)

$P_{p,adj}$	=	Statistically adjusted mean quantity of fuel consumed in activity scenario p (tonnes/household/day)
$NCV_{p,fuel}$	=	Net calorific value of the activity fuel(s) (TJ/mass or volume units)
$EF_{p,f,CO2}$	=	CO_2 emission factor from use of activity fuel f (tCO_2/TJ). Note: If the activity introduces or utilizes fossil fuels, the baseline emission factor $EF_{b,f,CO2}$ shall be used in place of the activity emission factor ($EF_{p,f,CO2}$)
$fNRB_{adj,b,y}$	=	Adjusted Fraction of non-renewable biomass (Baseline) (See ICS 20). Note: If the activity scenario involves biomass, $fNRB_{adj,b,y}$ is equal to the baseline $fNRB_{b,y}$; If the activity scenario involves fossil fuels, $fNRB_{adj,b,y} = 1$
$EF_{p,f,nonCO2}$	=	Non- CO_2 emission factor of activity fuel f (tCO_2e/TJ).

9| LEAKAGE EMISSIONS

9.1 | Identification of Leakage Emission Sources

9.1.1 | Leakage (LE_y) refers to the net change of anthropogenic GHG emissions occurring outside the activity boundary that are attributable to the activity.

9.1.2 | This methodology identifies two primary categories of leakage that shall be accounted for:

a. **Embodied Emissions (Upstream)** (Section 9.2 |).

b. **Market and Behavioural Leakage** (Section b).

$$LE_y = LE_{Embodied,y} + LE_{Market,y} \quad \text{Eq. 17}$$

Where,

LE_y	=	Total Leakage Emissions in year y (tCO_2e/yr)
$LE_{Embodied,y}$	=	Leakage due to embodied emissions of the activity technology in year y (tCO_2e/yr)
$LE_{Market,y}$	=	Leakage due to market and behavioural effects in year y (tCO_2e/yr)

9.2 | Embodied Emissions ($LE_{Embodied,y}$)

9.2.1 | Embodied emissions associated with the manufacturing and transport of the activity devices shall be accounted for leakage.

9.2.2 | **Standardized Default Deduction:** A standardized default deduction of **17.0 kg CO_2e per unit** (0.017 tCO_2e/unit)[3] may be applied to account for the cradle-to-gate embodied emissions for all decentralized thermal energy technologies covered by this methodology. Alternatively, the activity developer may conduct their own lifecycle assessment to determine activity-specific embodied emissions using standard methodologies, subject to VVB validation.

9.2.3 | **Calculation and Amortization of Embodied Emissions**

9.2.3.1 | The activity developer shall apply one of two pathways for the deduction of embodied emissions, contingent upon the verifiable technical lifetime of the activity device (as established via options listed under Parameter ICS 6):

a. **Short-Lived Technologies (Technical Lifetime < 5 years/ Optional for others):** For artisanal clay stoves, low-cost portable metal stoves, or temporary transitional devices, or durable technologies where the activity developer prefers a simplified one-time deduction the total default embodied emissions shall be deducted entirely upfront from the credits issued during the first monitoring period for that specific unit.

$$LE_{Embodied,y} = N_{disseminated,y} \times EM_{EF} \qquad \text{Eq. 18}$$

Where,

$LE_{Embodied,y}$	=	Leakage due to embodied emissions in year y (tCO_2e/yr)
$N_{disseminated,y}$	=	Number of new activity technology units disseminated in year y
EM_{EF}	=	Embodied emission factor per device (0.017 tCO_2e/unit default, or activity specific technology embodied emission factor value) (tCO_2e/unit)

b. **Durable Technologies (Technical Lifetime ≥5 years)**: The total embodied emissions shall be amortized (distributed evenly) over the duration of the First Crediting Period (5 years). The annual deduction per operational unit is

$$LE_{Embodied,y} = N_{disseminated,y} \times \left(\frac{EM_{EF}}{5}\right) \qquad \text{Eq. 19}$$

Where,

[3] Note: This default value represents a conservative, standardized proxy derived from aggregated global lifecycle assessments of household stoves, officially applied to eliminate the requirement for developers to conduct bespoke LCAs.

$LE_{Embodied,y}$	=	Leakage due to embodied emissions in year y (tCO_2e/yr)
$N_{disseminated,y}$	=	Number of new activity technology units disseminated in year y
EM_{EF}	=	Embodied emission factor per device (0.017 tCO_2e/unit default, or activity specific technology embodied emission factor value) (tCO_2e/unit)
5	=	Duration of 1st crediting period over which emissions are amortized (years)

9.2.3.2 | **Mandatory True-Up Provision:** If an activity utilizing approach b ceases verification or permanently terminates prior to the completion of the 5-year 1st Crediting Period, the activity developer shall conduct a true-up calculation at the final issuance event. Any remaining unaccounted embodied emissions for the active device fleet shall be deducted in full, from the final issuance request.

9.3 | Market and Behavioural Leakage ($LE_{Market,y}$)

9.3.1 | This category addresses potential leakage sources such as the reuse of baseline equipment outside the boundary, market effects on fuel availability, and adverse technology selection.

9.3.2 | **Assessment Options**: The activity developer shall determine Market Leakage ($LE_{Market,y}$) following one of the three options below. The chosen option shall be documented in the PDD/VPA-DD.

9.3.2.1 | **Option 1: Negligible Leakage (De Minimis)**: The activity developer may justify the application of $LE_{Market,y}$ = 0, only if both of the following conditions are verifiably demonstrated to the satisfaction of the VVB:

a. **Condition 1 (Addressing Equipment Transfer):** The activity documentation provides a credible, evidence-based justification that the transfer and reuse of functional baseline equipment outside the activity boundary is negligible or does not result in negative leakage. This shall be supported by the implementation of effective baseline stove displacement mechanisms and monitoring data (e.g., usage surveys).
b. **Condition 2 (Internalizing Rebound Effects):** The activity's monitoring plan (e.g., P-KPT) has been robustly designed and verifiably implemented to capture all relevant end-user fuel consumption, including "stove stacking," thereby fully internalizing the rebound effect into Activity Emissions (See Section 8.2.2 |).

9.3.2.2 | **Option 2: Conservative Default** If the conditions for Option 1 cannot be verifiably met (e.g., the P-KPT failed to adequately capture parallel baseline stove use), and the developer does not choose Option 3, a conservative default adjustment shall be applied. This serves as a default

deduction for failing to conduct a complete assessment or internalize all emission sources (rebound). A mandatory 2% deduction (0.02) shall be applied to the net emission reductions prior to leakage.

$$LE_{Market,y} = \left(BE_y - AE_y\right) \times 0.02 \qquad \text{Eq. 20}$$

Where,

$LE_{Market,y}$	=	Leakage due to market and behavioural effects in year y (tCO_2e/yr)
BE_y	=	Final Crediting Baseline Emissions in year y (tCO_2e/yr)
AE_y	=	Final statistically adjusted Activity Emissions in year y (tCO_2e/yr)
0.02	=	Mandatory 2% conservative default leakage penalty factor (fraction)

9.3.2.3 | **Option 3: Detailed Assessment:** The activity developer may opt to conduct a detailed, quantitative assessment of all potential market leakage sources. The activity documentation shall include an evidence-based description and quantification of each potential source. A leakage investigation survey shall be conducted every two years. Leakage risks deemed demonstrably negligible (de minimis) can be ignored, provided the case for their insignificance is substantiated with evidence.

9.3.2.4 | The potential sources of leakage ($LE_{source,y}$) shall be assessed in the context of suppressed demand (Annex 1).

$$LE_{Market,y} = \sum LE_{source,y} \qquad \text{Eq. 21}$$

Where,

$LE_{Market,y}$	=	Total leakage due to market and behavioural effects in year y (tCO_2e/yr)
$LE_{source,y}$	=	Quantified leakage emissions from each specific individually assessed market/behavioural source in year y (tCO_2e/yr)

10| NET GHG EMISSION REDUCTIONS

10.1 | Calculation of net GHG emission reductions

10.1.1 |The Net Emission Reductions (ER_y) are the final result of the quantification process.

$$ER_y = ((BE_y - AE_y) \times HE_{ind}) - LE_y \qquad \text{Eq. 22}$$

Where,

ER_y	=	Net Emission Reductions in monitoring period y (tCO_2e/yr)

BE_y = Final Crediting Baseline Emissions in monitoring period y (tCO_2e/yr)

AE_y = Final statistically adjusted Activity Emissions in monitoring period y (tCO_2e/yr)

HE_{ind} = Adjustment index for the Hawthorne Effect (fraction)

LE_y = Total Leakage Emissions in monitoring period y (tCO_2e/yr)

10.1.2 | **Adjustment for Hawthorne Effect** (HE_{ind}): To account for the potential observer bias - where end-users may temporarily alter or artificially inflate their clean stove usage behaviours during the P-KPT observation period or manual surveys (the Hawthorne Effect or Social Desirability Bias), an adjustment index (HE_{ind}) shall be applied to the calculation of emission reductions.

10.1.2.1 | **Phased implementation and review mechanism:** The application of the Hawthorne Effect adjustment index follows a phased implementation schedule designed to encourage the market's transition toward objective digital monitoring. The default values listed in Table 9 shall be apply for each respective phase.

Table 9. Phased Default Adjustment Factors for Hawthorne Effect

Phase	Applicable Vintage	Default Factor ($HE_{default}$)
Phase 1	2026 & 2027	0.90
Phase 2	2028 & 2029	0.85
Phase 3	2030 or after	0.75

10.1.2.2 | **Condition for Revision[4]:** The scheduled escalations to Phase 2 and Phase 3 represent conservative safeguards. The Secretariat shall conduct a formal review of the latest peer-reviewed empirical evidence (e.g., paired continuous monitor vs. manual survey studies) by June 2027, prior to the activation of Phase 2. If definitive scientific consensus demonstrates a lower magnitude of observer bias in modern contexts, the default factors shall be adjusted accordingly via a methodology update. Absent such peer-reviewed consensus, the scheduled defaults in Table 9 shall automatically apply.

[4] The Secretariat invites activity developers, researchers, and stakeholders to submit actual observation data (e.g., paired studies using SUMs and KPTs) and peer-reviewed literature regarding the magnitude of the Hawthorne effect. The Secretariat invites interest from activity developers for discussion on such studies during Phase 1.

10.1.2.3 | **Determination of HE_{ind}:** The activity developer shall determine the HE_{ind} using one of the following three options:

a. **Option 1: Default Adjustment:** If the activity quantifies usage and fuel consumption primarily through manual P-KPTs and in-person usage surveys (without continuous electronic monitors), the default adjustment index corresponding to the vintage Phase (as defined in Table 9) shall be strictly applied.

$$HE_{ind} = HE_{default} \quad \text{Eq. 23}$$

b. **Option 2: SUMs-based Adjustment:** If the activity complements P-KPTs with continuous Stove Use Monitors (SUMs) to empirically quantify the magnitude of the Hawthorne Effect for their specific user base, the adjustment index is calculated based on the ratio of usage during a normal monitoring period compared to usage during the P-KPT period. Rigorous protocols for SUMs deployment and data analysis (meeting 90/10 precision) shall be followed.

$$HE_{ind} = \text{MIN}(1, PTC_m / PTC_{KPT}) \quad \text{Eq. 24}$$

Where,

HE_{ind} = Empirically derived adjustment index for the Hawthorne Effect (fraction)

1 = Mathematical cap to ensure the index cannot exceed 1.0 (preventing artificial inflation if $PTC_m > PTC_{KPT}$

PTC_m = Average number of activity technology cooking events per day measured over a normal 1-month unobserved period utilizing continuous SUMs data (events/day). This 30-day period shall be collected contiguous to (immediately before, after, or overlapping) the P-KPT period to ensure seasonal comparability, but shall strictly exclude the specific days enumerators were physically present.

PTC_{KPT} = Average number of activity technology cooking events per day measured concurrently during the physical P-KPT observation period (events/day).

c. **Option 3: Digital MRV / Continuous Sensor Exemption:** Activities quantifying long-term usage via Continuous Stove Monitors (SUMs) or robust Digital MRV (dMRV) systems are exempt from the Hawthorne Effect penalty (HE_{ind} = 1.0). This exemption applies ONLY IF the continuous monitoring covers a statistically representative sample (meeting the 90/10 rule) and is deployed contiguous to, and directly overlapping with, the physical P-KPT measurement period, or if the activity relies entirely on continuous monitoring for crediting.

11| MEETING METHODOLOGICAL PRINCIPLES

11.1 | Encouraging ambition over time

11.1.1 |The methodology ensures that credited emission reductions exceed business-as-usual and encourage increasing ambition through:

a. **Mandatory Downward Adjustment Factor (DAF):** The application of the DAF ensures that the crediting baseline (BE_y) is lowered annually, based on the host country's long-term Net-Zero trajectory or the established Ambition Floor.

b. **Dynamic Performance Monitoring:** Biennial Activity KPTs (P-KPTs) ensure actual field performance (including degradation) is accurately captured, incentivizing the continuous maintenance or replacement of technologies.

11.2 | Equitable sharing of mitigation benefits

11.2.1 |The methodology promotes the equitable sharing of benefits by operating under the GS4GG Community Services Activity (CSA) *Requirements*. Adherence to the Safeguarding Principles & Requirements and mandatory Stakeholder Consultation Requirements ensures end-user rights and interests of local stakeholders are protected.

11.2.2 |The activity itself provides direct co-benefits to households, including improved health through reduced Indoor Air Pollution (IAP) and time or monetary savings related to fuel acquisition.

11.3 | Avoidance of double counting

11.3.1 |The methodology includes explicit requirements to mitigate the risk of double counting (double issuance, double use, and double claiming). This includes mandatory contractual ownership assertions, explicit end-user informed consent regarding carbon waivers, unique database tracking for all devices (Section 14|), and registry-level checks against overlapping Safe Water Supply (SWS) activities and Jurisdictional REDD+ programs.

11.4 | Aligning with NDC and LT-LEDS

11.4.1 |The mitigation activity inherently aligns with national climate goals. The mandatory Lock-In Risk Analysis (Section 6.4 |) ensures the activity accelerates the transition away from inefficient technologies without creating infrastructural path dependencies. Furthermore, the mandatory DAF structurally links the activity's baseline trajectory to the host country’s published NDCs or Long-Term Low-Emission Development Strategies (LT-LEDS).

11.5 | Encouraging Broad Participation

11.5.1 |The methodology accommodates diverse implementation environments by providing distinct calculation pathways applicable to Micro, Small, and Large-scale activities. It utilizes standardized approaches for complex parameters (e.g., fNRB, Embodied Emissions defaults) to materially reduce transaction costs and allows for seamless aggregation under Programmes of Activities (PoA) (Section 16|).

11.6 | Including Data Sources, Accounting for Uncertainty, and Monitoring

11.6.1 |The methodology ensures robustness in data use, uncertainty management, and monitoring:

a. **Data Sources:** Mandates high-quality data. Core performance parameters shall be determined via direct field measurement (KPTs). Other parameters (fNRB, NCV, EFs) shall use recognized sources (IPCC, standardized tools) or validated activity-specific data.

b. **Uncertainty management**: Uncertainty is explicitly addressed and quantified (Section 17). Mandatory statistical conservatism (Lower/Upper Bounds via the 90/10 rule) is automatically applied if strict precision targets are not met.

c. **Rigorous Monitoring**: A rigorous monitoring plan is required (Section 14|), including biennial performance testing (internalizing rebound/stacking) and annual cohort-based usage surveys.

11.7 | Taking into Account Policies, Measures, and Relevant Circumstances

11.7.1 |The methodology continuously accounts for the *de facto* policy environment. The mandatory Regulatory Surplus Analysis (Section 6.3 |) guarantees the activity is genuinely additional to existing laws and enforced mandates. The baseline determination relies strictly on empirical local realities, utilizing the B-KPT to capture the exact cooking practices, fuel availability, and socio-economic circumstances specific to the target population.

12| REVERSALS

12.1 | Assessment of Reversal Risks

12.1.1 |The activity generates GHG emission reductions by avoiding the combustion of non-renewable biomass, thereby relieving pressure on existing carbon stocks in the relevant greenhouse gas reservoirs (forests and woodlands). The methodology does not generate credits for quantified carbon stock sequestered or its avoided loss.

12.1.2 | While the avoidance of the specific combustion event is immediate and permanent, the biomass stocks preserved by the activity remain subject to potential future depletion due to natural disturbances (e.g., fires, pests) or anthropogenic drivers (e.g., land clearance).

12.1.3 | In the context of decentralized thermal energy service activities, the activity developer operates the technology distribution and data management infrastructure but possesses no legal control, land tenure, or management authority over the physical greenhouse gas reservoir (the forest or land area). Consequently, the activity is formally classified under the "No Control" exemption regarding the carbon reservoir. Non-permanence buffer pool deductions are therefore fundamentally inappropriate for avoidance activities applying this methodology and shall not be required.

12.2 | Mitigation and Management of Reversal Risks

12.2.1 | Pursuant to the "No Control" status of the activity developer over the reservoir, this methodology applies an alternative approach to address non-permanence risk through dynamic monitoring replacing the requirement for Reversal Risk Buffer Pools.

12.2.2 | The non-permanence risk to the biomass reservoir shall be mitigated and managed through the mandatory periodic updating of the fNRB parameter and the baseline fuel scenario, subject to the following safeguards at the time of crediting period renewal (Section 17|):

a. **Dynamic fNRB Updating:** The fNRB parameter shall be periodically updated utilizing the latest versions of approved standardized science-based tools (e.g., MoFuSS or A6.4 fNRB Tool – default values) to accurately reflect the current physical reality of the biomass reservoir. The updated fNRB value shall be applied to the subsequent crediting period. If the updated fNRB value decreases, the lower value shall be applied without further justification. If the updated fNRB value increases, the activity developer shall justify the continued use of the higher value by demonstrating that users still source wood from the same area.

b. **Catastrophic Disturbance & Biomass Availability Check:** The activity developer shall conduct a qualitative assessment of the biomass supply area using available evidence (e.g., satellite imagery, government forestry reports). If a catastrophic disturbance event (e.g., severe wildfires or rapid mass land-use conversion to agriculture/urbanization) has effectively depleted the historic biomass reservoir, OR if the updated fNRB calculates a mathematically higher fraction of non-renewability than the previous crediting period, the Baseline Fuel Scenario (Section 7.3.1) shall be formally re-evaluated.

c. **Baseline Validation:** If the assessment confirms that the historic woody biomass resource is no longer physically available or accessible to the target population due to severe depletion, the

activity developer shall empirically demonstrate (via an updated baseline survey) the actual alternative fuels the population has been forced to adopt (e.g., renewable agricultural residues, dung, or fossil fuels). The baseline scenario shall be formally updated to reflect these alternative fuels, thereby organically adjusting the crediting baseline to match post-disturbance realities and preventing over-crediting for non-existent resources

12.3 | Addressing Reversals

12.3.1 |Because the mitigation outcome is generated via avoidance (not sequestration), and the risk of macro-level non-permanence is addressed ex-ante for future crediting periods via the dynamic updating of the fNRB and baseline fuel scenario, retrospective cancellation of credits or contributions to a Reversal Risk Buffer Pool are not required.

13| UNCERTAINTY QUANTIFICATION

13.1 | Approach to Uncertainty Management

13.1.1 |This methodology establishes a structured framework to quantify and mitigate uncertainty, ensuring the calculated Net GHG Emission Reductions remain strictly conservative. This approach combines methodological standardization for minor parameters with mandatory statistical quantification for core empirical parameters. [Note: The management of statistical and measurement uncertainty detailed in this section is structurally distinct from, and applied prior to, the Downward Adjustment Factor (DAF). Uncertainty adjustments correct for empirical sampling variance, whereas the DAF addresses macroeconomic policy ambition].

13.1.1.1 |**Standardization and Defaults:** Uncertainty for non-measured parameters (e.g., Net Calorific Value (NCV), Emission Factors (EFs), Embodied Emissions, Leakage) is managed using conservative IPCC defaults or methodology approved standardized proxies. For fNRB, uncertainty is managed through conservativeness embedded within the approved modelling tools (e.g. MoFuSS).

13.1.1.2 |**Statistical Conservativeness:** Uncertainty for core parameters derived from sampling (e.g., Baseline Fuel Consumption, Activity Fuel Consumption, Usage Rate) is managed by applying mandatory statistical adjustments if the required precision targets (90/10) are not met (Section 7.4.1 & Section 8.2.5|). This rule requires utilizing the Lower Bound of the one-sided 90% CI for baseline/savings parameters to prevent over-estimation, and the Upper Bound of the one-sided 90% CI for activity consumption parameters to prevent under-estimation.

13.2 | Sources of Uncertainty and Mitigation

13.2.1 |Key uncertainty sources and their mandated mitigation measures are summarized in the following table. This matrix shall serve as the normative reference for Validation and Verification Bodies (VVBs) when auditing uncertainty.

Table 10. Key uncertainty sources and mitigation measures

Source of Uncertainty	Parameter(s) Affected	Mandatory Mitigation Measure(s)
Measurement and Sampling Uncertainty (KPTs)		
Variability in user behaviour, fuel characteristics, sampling error, and measurement precision during KPTs.	$P_{b,mean}$ (Baseline Fuel Consumption), $P_{p,mean}$ (Activity Fuel Consumption)	1. Robust sampling: Strict adherence to sampling requirements and minimum sample sizes (Section 14.5 |). 2. Mandatory application of statistical conservativeness (Lower/Upper Bounds) if precision targets (90/10) are not met.
Parameter Uncertainty (Usage Rate)		
Potential overestimation of usage due to survey bias or recall error, and uncertainty in determining cohort drop-off rates.	$U_{P,y}$ (Usage Rate)	1. **Cohort Sampling:** Mandatory cohort sampling to accurately capture adoption curves over time (Section 14.5 |). 3. Application of statistical conservatism (Lower Bound) if 90/10 precision is not met.
Parameter Uncertainty (Defaults)		
Uncertainty in the values of standardized macro-parameters.	fNRB, NCV, EFs, Embodied Emissions	Standardization: Mandatory use of approved standardized tools (e.g., MoFuSS for fNRB) or conservative IPCC/methodology default values.
Behavioural Uncertainty (Rebound/Stacking)		
Changes in user behaviour (e.g., stove stacking, compensation for lost co-benefits) that increase activity emissions.	Activity Emissions (AE_y) Market Leakage ($LEMarket,y$)	Internalization via Monitoring Design: Mandatory requirement that P-KPTs measure total relevant fuel consumption to internalize these effects (Section 8.2 |).

14| MONITORING METHODOLOGY

14.1 | Requirements

14.1.1 |**Monitoring Plan:** The activity developer shall develop and implement a Monitoring Plan in the PDD/VPA-DD. The plan shall delineate the procedures for collecting, recording, analysing, and archiving all data required for the quantification of emission reductions and the verification of applicability and safeguard criteria.

14.1.2 |**Measurement Equipment and QA/QC Calibration:** All physical measurement equipment used for monitoring (e.g., hanging scales for Kitchen Performance Tests, moisture meters) shall comply with relevant national or international accuracy standards. To prevent data invalidation due to calibration drift during rugged field deployment, all physical weighing scales shall be verified against a known standard reference check-weight (e.g., a certified 1kg or 5kg mass) immediately prior to and during each monitoring campaign. Calibration logs shall be maintained and made available to the VVB. If a scale is discovered to be out of calibration during a post-test check, the maximum observed error margin shall be applied to the dataset in the most conservative mathematical direction.

14.1.3 |**Digital Monitoring (dMRV) and Data Privacy (GDPR Compliance):** The utilisation of digital monitoring technologies (e.g., continuous Stove Use Monitors [SUMs], Smart Meters, secure cloud databases) is highly encouraged to enhance accuracy and mitigate observer bias. To strictly comply with the General Data Protection Regulation (GDPR) and regional data privacy laws, the activity developer is not required to publish precise household-level GPS coordinates. However such record shall be maintained for validation/verification by VVB. Geographic tracking and database logging shall be recorded at the lowest legally permissible administrative unit, provided that unique device identifiers (e.g., serial numbers, digital IDs) are robustly implemented to securely prevent double counting.

14.1.4 |**Data Archiving:** All monitored data, including raw surveys, KPT measurement logs, calibration records, and dMRV telemetry, shall be archived electronically and retained for the duration of the crediting period plus an additional two (2) years after the final issuance.

14.1.5 |**Accounting for Seasonality and Space Heating:** The monitoring plan shall explicitly detail how the impact of seasonal variation and the use of technologies for space heating (if common in the activity area) are accounted for in the monitoring design (e.g., timing of KPTs and surveys), utilizing data collected during the Baseline Scenario Survey (ICS 7).The activity developer shall justify how the monitoring approach will result in accurate (representative of annual consumption) or conservative baseline and activity fuel use measurements. If space heating is common, the justification shall include an explanation of how fuel consumption for heating

has been differentiated from cooking/thermal application consumption, or how it has otherwise been conservatively addressed.

14.2 | Data and parameters not monitored

14.2.1 |The following parameters shall be determined ex-ante at the time of Design Certification (or crediting period renewal) and shall remain fixed for the duration of the crediting period.

Parameter ID	**ICS 1**
Data/parameter:	Activity technology description and thermal efficiency
Description	The detailed description of the activity technology shall include as a minimum: Manufacturer/retrofitting entity name, product name (if applicable), technology type, capacity characteristics, continuous useful energy output demonstration, and rated thermal efficiency (where applicable, e.g., cookstoves), and the rated technical lifetime. Any performance certifications from recognized standards bodies shall also be provided.
Data unit:	%, kW
Purpose of data:	☒ Baseline emissions ☒ Activity emissions ☒ Applicability
Value(s) applied:	To be determined at activity level
Source of data:	☒ Measured ☒ Other source Manufacturer specifications AND standardized laboratory test reports conducted by an independent authorized testing body. Professional opinion or expert opinion is not accepted as a source for this parameter.
Choice of data or measurement methods and procedures:	For cookstoves, thermal efficiency shall be determined using the ISO 19867-1 or national standard or Water Boiling Test (WBT) protocol – if mandated by national standard. Any of the following sources shall be used for activity technology description: • Manufacturer specifications • Certifications by a national standards body or an appropriate certification party recognized by a national standards body • Commercial guarantee • Technical reports from the installer • For stoves built on-site at the end-user location, reports of Standard WBT by stove manufacturer or installer or independent authorized testing body.
Treatment of uncertainty	N/A
Comments:	• Efficiency values are used to verify applicability criteria (Section 3.2.1 |) and for grouping similar technologies (Section 8.1.3 |).

	• If technical information is unavailable at validation, the VVB shall raise a Forward Action Request (FAR). The developer shall provide this information to the VVB before verification is complete.

Parameter ID	**ICS 2**
Data/parameter:	Avoidance of double counting or double claiming among activity participants
Description	Evidence of avoidance of double counting or double claiming with other parties directly involved with the activity or programme (e.g., manufacturers, retailers).
Data unit:	N/A
Purpose of data:	☒ Applicability
Value(s) applied:	N/A
Source of data:	☐ Measured ☒ Other source
Choice of data or measurement methods and procedures:	Written assertions from the activity developer confirming ownership rights and the intention to sell emission reductions. These assertions shall be directed to or signed with all applicable parties, including: • All other activity participants; • Activity technology producers; and • Retailers of the activity technology or the renewable fuel.
Treatment of uncertainty	N/A
Comments:	The written assertions shall be provided and verified before the first verification.

Parameter ID	**ICS 3**
Data/parameter:	Avoidance of double counting or double claiming with other mitigation actions
Description	Review and analysis of mitigation actions in other national or international voluntary or UNFCCC/compliance mechanisms
Data unit:	N/A
Purpose of data:	☒ Applicability
Value(s) applied:	N/A
Source of data:	☐ Measured ☒ Other source Publicly available information from Gold Standard, other voluntary standards, and CDM/A6.4 databases.

Choice of data or measurement methods and procedures:	**Requirement** • Identify any mitigation actions of similar technology operating in overlapping spatial boundaries. Undertake due diligence to ensure the activity does not include stoves already included in other mitigation actions. • To prevent double-counting and displacement, the activity developer shall conduct a systematic overlap assessment. • The VVB is required to validate this assessment at the initial design review and verify its continued accuracy at every subsequent VPA inclusion review or design change review. **Assessment Procedure** The activity developer shall perform the following, which the VVB shall validate/verify: • Identify and list all mitigation actions of similar technology (i.e., providing the same output and using the same equipment or conversion process) that are operating within overlapping spatial boundaries of the activity. • Use, at a minimum, publicly available information from the following registries: i. Gold Standard ii. Verra iii. UNFCCC CDM / future mechanisms (Project & PoA/VPA databases) iv. Any recognized national or regional standards in the activity location. **Required Timing of Assessment** This assessment and its validation/verification shall be undertaken at: a. The initial design review; b. Each VPA inclusion review; and c. Any design change review, specifically when the project or VPA boundary changes. **Actions Required if Overlap is Identified** If one or more overlapping actions are identified, the activity developer shall document, and the VVB shall approve, the following: • **Quantification Practices:** Practices to ensure the activity quantifies emission reductions only from the technology it has implemented. • **Displacement Avoidance:** A description of the practices to ensure the activity does not displace the technology of other mitigation actions. • **Monitoring & Discounting:** A monitoring approach and method designed to discount emission reductions if the activity is found to displace or operate alongside another mitigation action.
Treatment of uncertainty	N/A

Comments:	N/A

Parameter ID	**ICS 4**
Data/parameter:	Indoor air pollution (IAP) Assessment
Description	Evidence demonstrating that IAP levels (PM 2.5 and CO) are not worsened compared to the baseline.
Data unit:	Qualitative / Quantitative emissions tiers
Purpose of data:	☒ Applicability
Value(s) applied:	N/A
Source of data:	☒ Measured ☒ Other source Manufacturer's test reports (lab or field), independent modelling, or recent (≤5 years old) published literature/reports by independent agencies relevant to the specific technology and context. **Exception:** References older than 5 years may be accepted if the activity developer provides a verifiable declaration that the fundamental design, dimensions, and materials of the technology have remained unchanged since the study was published.
Choice of data or measurement methods and procedures:	**Acceptable Data Sources for IAP Level** 1. **Primary Sources (Activity and Baseline)** The following sources shall be used to determine the IAP level for both the activity technology and the baseline scenario: • Certification resulting from a manufacturer's test; • Report of field testing of the technology; • Report of lab testing of the technology; or • Results of modelling the technology's operation under field conditions. 2. **Additional Sources** • **For Activity Technology:** For stoves built on-site at the end-user location, existing reports of lab or field testing of similar technology are also accepted. • **For Baseline Scenario:** "Expert opinion" is also an acceptable source, provided the expert is a certified or authorized professional qualified to conduct IAP assessments as per the Host Country standard body or applicable energy or air quality testing standard. **3. Fallback Provision** • If no sources from above lists are available for a given technology (activity or baseline), references from published literature or reports by independent agencies may be used.

Treatment of uncertainty	N/A
Comments:	Required to demonstrate compliance with Applicability Criteria 3.2.7.

Parameter ID	**ICS 5**
Data/parameter:	Regulatory framework analysis
Description	Evidence that the activity does not undermine or conflict with any national, sub-national or local regulations or guidance for thermal energy supply/devices or fuel supply or use for household cooking
Data unit:	N/A
Purpose of data:	☒ Applicability
Value(s) applied:	N/A
Source of data:	☐ Measured ☒ Other source Official regulatory documents, government publications.
Choice of data or measurement methods and procedures:	The activity developer shall: • Identify and summarize all national, sub-national, and local regulations and guidance applicable to the thermal energy services or devices. • Describe and demonstrate how the activity complies with applicable the applicable regulatory framework.
Treatment of uncertainty	N/A
Comments:	Used to demonstrate compliance with Safeguard 3.3.2 and the Regulatory Analysis (Section 6.3 |).

Parameter ID	**ICS 6**
Data/parameter:	Expected technical life of activity technology
Description	The expected technical life of an individual activity technology.
Data unit:	Operating hours (e.g., "5,500 hours") or time period (e.g., "five years")
Purpose of data:	☒ Activity emissions ☒ Safeguarding
Value(s) applied:	N/A
Source of data:	☐ Measured ☒ Other source Manufacturer specifications, commercial guarantees, or certification by a recognized national standards body. For on-site built stoves, robust field reports of the average technical life of the same stove type under similar conditions.

Choice of data or measurement methods and procedures:	**Requirement:** The technical life of the activity technology shall be fixed and recorded at the time of design certification or distribution. **Acceptable Data Sources for Technical Life:** Any of the following sources shall be used: • Manufacturer specifications; • Certification by a national standards body (or an appropriate party recognized by one); • Commercial guarantee or a guarantee from the installer; or • For stoves built on-site: Field reports on the average technical life of the same stove type under similar (socioeconomic and cultural) conditions. These reports shall comply with sampling requirements (Section 14.5 |). Simulation modelling may be used in conjunction with such field reports. For artisanal built-on-site stoves, internal longitudinal field monitoring reports generated by the activity developer from previous deployments of the identical stove design are acceptable, subject to VVB verification. **Note:** Professional or expert opinion is **not** accepted as a source for this parameter.
Treatment of uncertainty	N/A
Comments:	This parameter explicitly dictates whether Embodied Emissions shall be deducted entirely upfront (Option 1: <5 years) or amortized over 5 years (Option 2: ≥5 years) as per Section 9.2.2. Used to define the maximum period for claiming emission reductions for a specific unit unless replacement is verified (Section 3.2.9.4 |). **Claiming Reductions for Retrofitted/Repaired Devices** • If the expected technical life is shorter than the crediting period, the activity developer shall describe measures to ensure end-users are provided with replacement technology of comparable or higher quality at the end of the technical life. • The activity developer shall ensure that units are replaced (with comparable or better technology) or retrofitted (with a performance guarantee) at the end of their technical life to continue claiming emission reductions. A new activity cannot be registered for replacement/retrofitted stoves. **Claiming Reductions for Retrofitted/Repaired Devices**

	Emission reductions may be claimed for retrofitted/repaired devices during the extended lifetime only if the following conditions are met: a. **Documentation:** The details of the retrofits/repairs (e.g., parts replaced, specifications, personnel, date) for each device are documented. **AND - One of the following:** • **Warranty/Guarantee:** The extended lifetime is demonstrated through a warranty from the original manufacturer OR a guarantee from an experienced cookstove repair company, assuring performance (efficiency, safety, emissions) comparable to the original device. • **Durability Test:** The extended lifetime or durability of the retrofitted device is demonstrated through a test performed according to ISO 19867-1 requirements or a comparable national standard. Certification based on sample tests specified by the standard is acceptable

Parameter ID	**ICS 7**
Data/parameter:	Baseline Scenario Survey Results
Description	Report detailing the baseline cooking practices, stove types, and fuel mix in the target population.
Data unit:	N/A
Equations referred:	N/A
Purpose of data:	☒ Baseline emissions
Value(s) applied:	N/A
Source of data:	☐ Measured ☒ Other source Ex-ante household surveys conducted in the target area.
Choice of data or measurement methods and procedures:	**Applicability and Timing** • A baseline survey shall be conducted for each distinct baseline scenario identified and included in the activity. • The survey shall be undertaken at the start of the first crediting period. **Methodology** • The survey shall follow a justified sampling approach (e.g. simple random, stratified, cluster or multi-stage sampling approach) selected to ensure representativeness of the target population, and shall meet the required CI and minimum sample size required. • Information collected shall be in accordance with the sample survey questionnaire to be issued together with this methodology.

	• The survey shall collect data on the relative fuel use at different times of the year to address potential seasonal variation (e.g., "Relative to the amount of fuel you used this week, are there other times of the year when you use more/less fuel? If so, when?"). • If space heating is common in the activity area, the survey shall assess the impact of space heating on fuel consumption. **Minimum Sample Size** The minimum sample size is determined by the activity target population for the specific baseline scenario being surveyed: • **Population < 500:** Minimum sample size of 50 • **Population 500 to 1000:** Minimum sample size of 10% of the population • **Population > 1000:** Minimum sample size of 100.
Treatment of uncertainty	N/A
Comments:	N/A

Parameter ID	**ICS 8**
Data/parameter:	$EF_{b,f,CO2}$
Description	CO_2 emission factor arising from use of fuel f in baseline scenario
Data unit:	tCO_2/TJ
Purpose of data:	☒ Baseline emissions ☒ Activity emissions
Value(s) applied:	**Wood:** Methodology default, 112 tCO_2/TJ, IPCC 2019
Source of data:	☐ Measured ☒ Other source
Choice of data or measurement methods and procedures:	For wood and charcoal, the following defaults derived from the IPCC shall be applied: • **Wood:** 112 tCO_2/TJ • **Charcoal:** ○ Default: 112 tCO_2/TJ (combustion only) ○ **WCCF 6:1** – 355.36 tCO_2/TJ (includes charcoal production emissions) ○ **WCCF 4:1** – 236.91 tCO_2/TJ (includes charcoal production emissions)
Treatment of uncertainty	N/A
Comments:	Used to calculate Baseline Emissions (BE_y)

Parameter ID	**ICS 9**
Data/parameter:	$EF_{b,f,non-CO2}$
Description	Non-CO_2 (CH_4 and N_2O) Emission factor of the fuel used in the baseline and activity scenarios, weighted by the applicable GWPs.
Data unit:	tCO_2/TJ
Purpose of data:	☒ Baseline emissions ☒ Activity emissions
Value(s) applied:	For wood and charcoal, the following defaults derived from the IPCC (AR5) shall be applied: • **Wood:** 9.46 tCO_2e/TJ (AR5 GWP) • **Charcoal:** ○ Default: 5.87 tCO_2/TJ (combustion only ○ **WCCF 6:1** – 89.68 tCO_2/TJ (includes charcoal production emissions) ○ **WCCF 4:1** – 61.74 tCO_2/TJ (includes charcoal production emissions)
Source of data:	☐ Measured ☒ Other source
Choice of data or measurement methods and procedures:	IPCC defaults.
Treatment of uncertainty	N/A
Comments:	Used to calculate Baseline Emissions (BE_y)

Parameter ID	**ICS 10**
Data/parameter:	$EF_{p,f,CO2}$
Description	CO_2 emission factor arising from use of fuel f in activity scenario
Data unit:	tCO_2/TJ
Purpose of data:	☐ Baseline emissions ☒ Activity emissions
Value(s) applied:	For wood and charcoal, the following defaults derived from the IPCC shall be applied: • **Wood:** 112 tCO_2/TJ • **Charcoal:** ○ Default: 112 tCO_2/TJ (combustion only) ○ **WCCF 6:1** – 355.36 tCO_2/TJ (includes charcoal production emissions) ○ **WCCF 4:1** – 236.91 tCO_2/TJ (includes charcoal production emissions)
Source of data:	☐ Measured ☒ Other source

Choice of data or measurement methods and procedures:	If activity-specific emission factors are used (including upstream emissions): i. The activity boundary shall include these processes. ii. Avoidance of double counting shall cover all steps. i. The determination shall be fully documented and evidenced in the PDD.
Treatment of uncertainty	N/A
Comments:	Used to calculate Baseline Emissions (BE_y)

Parameter ID	**ICS 11**
Data/parameter:	$EF_{p,f,non-CO2}$
Description	Non-CO_2 (CH_4 and N_2O) Emission factor of the fuel used in the baseline and activity scenarios, weighted by the applicable GWPs.
Data unit:	tCO_2/TJ
Purpose of data:	☐ Baseline emissions ☒ Activity emissions
Value(s) applied:	For wood and charcoal, the following defaults derived from the IPCC shall be applied: • **Wood:** 9.46 tCO_2e/TJ (AR5 GWP) • **Charcoal:** ○ Default: 5.87 tCO_2/TJ (combustion only ○ **WCCF 6:1** – 89.68 tCO_2/TJ (includes charcoal production emissions) ○ **WCCF 4:1** – 61.74 tCO_2/TJ (includes charcoal production emissions))
Source of data:	☐ Measured ☒ Other source
Choice of data or measurement methods and procedures:	Hierarchy for non-standard fuels: i. IPCC defaults. ii. Activity-specific field tests by a qualified/accredited entity. iii. Activity-relevant measurement reports by qualified entities. iv. National defaults. v. Credible published literature for the activity area. If activity-specific/relevant results are used, they shall be cross-checked with IPCC defaults and differences justified. If activity-specific emission factors are used (including upstream emissions), the requirements listed in ICS 9 apply.
Treatment of uncertainty	N/A
Comments:	Used to calculate Baseline Emissions (BE_y)

Parameter ID	**ICS 12**
Data/parameter:	$NCV_{b,fuel}$
Description	The net calorific value of the fuel used in the baseline.
Data unit:	TJ/tons of fuel
Purpose of data:	☒ Baseline emissions ☒ Activity emissions
Value(s) applied:	For wood and charcoal, the following defaults derived from the IPCC shall be applied: • Wood: Methodology default, 0.0156 TJ/ton • Charcoal: Methodology default, 0.0295 TJ/ton • For other fuels, refer to IPCC defaults or activity-specific testing.
Source of data:	☐ Measured ☒ Other source IPCC defaults (latest applicable guidelines) or official national/regional data if demonstrably more conservative.
Choice of data or measurement methods and procedures:	Hierarchy for non-standard fuels: i. IPCC defaults. ii. Activity-specific testing by a qualified/accredited entity. iii. Activity-relevant measurement reports by a qualified entity. If activity-specific/relevant results are used, they shall be cross-checked with IPCC defaults and differences justified.
Treatment of uncertainty	N/A
Comments:	The methodology default emission factor shall be applied when the methodology default NCV is applied.

Parameter ID	**ICS 13**
Data/parameter:	$NCV_{p,fuel}$
Description	The net calorific value of the fuel used in the activity.
Data unit:	TJ/tons of fuel
Purpose of data:	☒ Baseline emissions ☒ Activity emissions
Value(s) applied:	For wood and charcoal, the following defaults derived from the IPCC shall be applied: • Wood: Methodology default, 0.0156 TJ/ton • Charcoal: Methodology default, 0.0295 TJ/ton • For other fuels, refer to IPCC defaults or activity-specific testing.
Source of data:	☐ Measured ☒ Other source

	IPCC defaults or validated activity-specific values (See ICS 12 for defaults).
Choice of data or measurement methods and procedures:	Same procedures as ICS 12
Treatment of uncertainty	N/A
Comments:	The methodology default emission factor shall be applied when the methodology default NCV is applied.

Parameter ID	**ICS 14**
Data/parameter:	HN_b
Description	Average number of individuals per household in the baseline scenario.
Data unit:	Persons/households
Purpose of data:	☒ Baseline emissions ☒ SDG baseline Used to mathematically convert measured household-level KPT fuel consumption data into per-capita data to verify against methodological caps (Eq. 4 and Eq. 7).
Value(s) applied:	To be determined at activity level
Source of data:	☒ Measured ☒ Other source Baseline survey
Choice of data or measurement methods and procedures:	N/A
Treatment of uncertainty	N/A
Comments:	Fixed ex-ante based on the initial baseline survey or official census data matching the target demographic. The ex-ante value shall be structurally validated against the demographic consistency check mandated in Section 7.3.2. Material deviations require downward mathematical adjustment; deviations >20% invalidate the baseline for that cohort.

Parameter ID	**ICS 15**
Data/parameter:	$P_{b,mean}$ (Baseline Fuel Consumption - Input for Type A, B, and C)

	P_{CAP} (Methodological Baseline Cap) The maximum allowable ceiling for unadjusted baseline fuel consumption to prevent over-crediting of historical inefficiencies or statistical KPT outliers.
Description:	Measured or default mean quantity of fuel consumed in baseline scenario b
Data unit:	tonnes/household/day
Purpose of data:	☒ Baseline emissions Calculation of unadjusted Baseline Emissions.
Value(s) applied:	At the start of the crediting period (fixed for 5 years). Mandatory update at CP renewal. (For industrial applications, update based on remaining lifetime assessment)
Source of data:	Determined ex-ante using Option A (B-KPT), Option B (Default), or Option C (MSL) as per Section 7.3.6. The B -KPT shall adhere to standardized KPT protocols. If B-KPT results exceed the threshold value, they shall be substantiated by independent third-party studies (e.g., government publications, WISDOM, FAO, UN). In any case, the value applied shall not exceed the cap value. a. **Primary Fuelwood Users** (≥75% of cooking events with wood): i. Threshold value: 0.75 tonnes/person/year of air-dried wood (or equivalent energy). If exceeded, substantiation by independent third-party studies is required. ii. Cap value (P_{CAP}): 1.25 tonnes/person/year of fuelwood (or equivalent energy). b. **Primary Charcoal Users or Mixed Baselines:** i. Threshold value: 0.20 tonnes/person/year of charcoal (or equivalent energy). ii. Cap Value (PCAP): 0.40 tonnes/person/year of charcoal (or equivalent energy).
Choice of data or measurement methods and procedures:	The choice of data and measurement method shall depend on the applicable option selected in Section 7.3.6: Option A: Baseline KPT (B-KPT), Option B: Default values, or Option C: Minimum Service Level (MSL).
Treatment of uncertainty	Managed via the procedures in Section 7.4.1. For Option A (B-KPT), 90/10 precision is required. If not met, the Lower Bound ($Pb_{,LB90}$) shall be used.

Comments:	The parameters Pb_{stat} Pb_{adj} and Pb_{LB90} are statistical parameters calculated from Pb_{mean} in accordance with the applicable equations.

Parameter ID	**ICS 16**
Data/parameter:	$P_{MSL,capita}$
Description:	Minimum Service Level; Per capita Minimum Service Level (MSL) default value for suppressed demand.
Data unit:	tonnes/person/year
Purpose of data:	☒ Baseline emissions Baseline estimation when unmet basic energy needs are empirically proven (Option C).
Value(s) applied:	Fuelwood: 0.50 t/capita/year. Charcoal: 0.13 t/capita/year.
Source of data:	Value(s) applied
Choice of data or measurement methods and procedures:	-
Treatment of uncertainty	The mandatory 5% downward conservativeness discount shall be applied mathematically via Equation 6.
Comments:	

Parameter ID	**ICS 17**
Data/parameter:	WCCF
Description:	Wood-to-Charcoal Conversion Factor (WCCF); The factor expressing the amount of wood required to produce a standard quantity of charcoal.
Data unit:	Ratio (kg wood per kg charcoal)
Purpose of data:	☒ Baseline emissions Standardized calculation of upstream wood extraction for charcoal-consuming households.
Value(s) applied:	Sub-Saharan Africa/LMICs: 6:1 (approx. 17% kiln efficiency). Industrialized Regions: 4:1 (approx. 25% kiln efficiency). Option to apply 4:1 is allowed.
Source of data:	Value(s) applied
Choice of data or measurement	-

methods and procedures:	
Treatment of uncertainty	-
Comments:	Activity-specific overrides are strictly prohibited to maintain environmental integrity and prevent adverse selection.

14.3 | Data and parameters monitored

14.3.1 |The following parameters shall be monitored during the crediting period.

Parameter ID	**ICS 18**
Data/parameter:	Notification to end-users
Description:	Evidence that end-users have been informed that they have transferred their rights to the carbon credits and cannot claim emission reductions from the activity.
Data unit:	N/A
Purpose of data:	☒ Safeguarding
Measurement and updating frequency	At the time of stove distribution/sale. Spot-checked during verification.
Measurement methods and procedures:	Transaction paperwork, end-user agreements, or recorded assertions during distribution/installation (in verifiable paper, digital or audio form). **Requirement** The activity developer shall provide verifiable evidence that end-users were informed about, and agreed to, the waiving of their carbon rights in exchange for the activity technology (e.g., for discounted pricing below true cost). **Acceptable Forms of Evidence** Evidence includes, but is not limited to, the following (or equivalents): • **Signed Forms:** Carbon title waiver forms or end-user agreements signed by the end-user. • **Transactional Records:** Transaction paperwork or recorded assertions made during distribution/installation confirming the user was notified. • **Digital or Audio Confirmations:** e.g. app-based acceptance, stored in a verifiable form. **VVB Verification** The VVB shall: • **Validate** (at initial review) the developer's proposed system

	for notifying end-users and collecting this evidence. • **Verify** (at each verification) that the system was implemented as validated by: i. Reviewing the collected evidence (e.g., signed forms, leaflets). ii. Cross-checking a sample of this evidence against distribution records and/Read-only monitoring surveys (if applicable) to confirm the notification and waiver process is effective and documented. • **Validate Novel Evidence Types:** If the developer proposes a form of evidence not listed above, the VVB shall validate its use only after confirming it meets all the following criteria: i. **Unambiguous:** The evidence shall clearly and unambiguously demonstrate that the end-user was informed of the waiver *and* provided their consent. ii. **Verifiable:** The evidence shall be auditable and its authenticity ascertainable by the VVB. iii. **Durable:** The evidence shall be recorded and stored in a manner that ensures its integrity and availability for VVB review throughout the crediting period.	
Entity/person responsible for the measurement:	CME/activity developer/Third party contracted by CME/Activity developer	
Measuring instrument(s):	Type of instrument	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	VVB shall verify a sample of the documentation.	
Treatment of uncertainty	N/A	
Comments:	N/A	

Parameter ID	**ICS 19**
Data/parameter:	$N_{b,p,y}$ (Input Data: Total number of operational units)

Description:	Number of activity technology-days included in the activity database for baseline b/activity p pair in year y.	
Data unit:	Days	
Purpose of data:	☒ Baseline emissions ☒ Activity emissions	
Measurement and updating frequency	Continuous (Sales/Distribution Records). Annual (Calculation)	
Measurement methods and procedures:	Calculated based on the Activity Database (derived from Sales/Distribution records). The calculation accounts for the date of commissioning and excludes stoves that have completed their technical life (if not replaced/retrofitted). The data is segmented by baseline/activity scenario pair (b,p) and age group (cohort/batch). To simplify calculations for large-scale deployments, developers may utilize 'Monthly Batching'. Under this approach, all stoves installed within a given calendar month may be treated as commissioned on the last day of that month for emission reduction calculation purposes (a conservative approach), provided the assumption is applied symmetrically across the crediting period.	
Entity/person responsible for the measurement:	CME/activity developer	
Measuring instrument(s):	Type of instrument	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	1. The activity developer shall maintain a complete, accurate, and electronically backed-up sales/distribution record throughout the entire crediting period. 2. The record shall be organized at the household/end-users level. The following information shall be recorded for each transaction: a. **End user Information:** (Required for *all* end-users, e.g., households, and *all* bulk purchasers, e.g., retailers) i. Name ii. Address	

	iii. Telephone number (if available) iv. Type of end-user (household, institutional, commercial) b. **Transaction and Product Details:** i. Date of installation ii. Geographic area of sale iii. Model/type of activity stove(s) sold/distributed iv. Quantity of activity stove(s) sold/distributed c. Unique identification of the product(s) (e.g., serial number) and the end-user's location (GPS coordinates). To comply with data privacy regulations, exact GPS coordinates are optional, provided alternative location descriptors (e.g., village, ward, point-of-sale district) are used alongside unique product identifiers to ensure traceability and prevent double counting. The VVB shall: • **Validate** (at initial review) the activity developer's proposed system for collecting, managing, and backing up the sales and distribution record. • **Verify** (at each verification) that the record is complete, accurate, and maintained as required by: i. Inspecting the sales and distribution record for completeness and compliance with all data points listed in above. ii. Cross-checking a sample of record entries against other evidence (e.g., monitoring data, end-user agreements, distribution reports) to confirm the accuracy and authenticity of the sales data.
Treatment of uncertainty	N/A
Comments:	This parameter is the input for calculating BE_y *and* AE_y. It is adjusted by the Usage Rate ($U_{p,y}$) in the final calculation (See Section 7.3.8 |).

Parameter ID	**ICS 20**
Data/parameter:	$f_{NRB,b,y}$
Description:	Fraction of biomass used in the baseline scenario b that can be established as non-renewable biomass
Data unit:	%
Purpose of data:	☒ Baseline emissions ☒ Activity emissions

Measurement and updating frequency	Determined ex-ante and fixed for the crediting period OR updated biennially. The choice shall be confirmed at Design Certification. (Mandatory update at CP renewal)	
Measurement methods and procedures:	Determined using the latest version of approved standardized tools i.e., MoFuSS, or approved A6.4 fNRB tool. Activity-specific assessments are permitted if conducted rigorously following the guidance of the selected tool.	
Entity/person responsible for the measurement:	CME/activity developer/Third party	
Measuring instrument(s):	Type of instrument	N/A
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	Adherence to the requirements of the selected standardized tool. Transparency in data sources and assumptions. VVB validation of the methodology and input data.	
Treatment of uncertainty	Managed through the conservativeness of the standardized tools or validated activity-specific assessment	
Comments:	This parameter is crucial for calculating ERs when biomass is used.	

Parameter ID	**ICS 21**
Data/parameter:	$P_{p,mean}$ (Activity Fuel Consumption - Input for Type A, B, and C)
Description:	Mean quantity of fuel consumed in activity scenario p during year y.
Data unit:	kg/household-day, kg/person-meal, or other appropriate unit.
Purpose of data:	☒ Activity emissions
Measurement and updating frequency	Biennial (every two years). The results are valid for a maximum of two years from data collection date. If the monitoring period extends beyond 2 years, additional KPT shall be conducted for valid data.
Measurement methods and procedures:	Determined via a statistically representative activity KPT (Section 14.5 |). The P-KPT shall adhere to standardized KPT protocols. The P - KPT measures total relevant fuel consumption, inherently accounting for stove stacking and rebound effects (Section 8.2 |).

Entity/person responsible for the measurement:	CME/activity developer/Third party	
Measuring instrument(s):	Type of instrument	Weighing scales, moisture meters (if applicable)
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	Compliance with sampling requirements (Section 14.5 |), QA/QC (Section 14.4 |), and KPT protocols. Calibration of equipment	
Treatment of uncertainty	Managed via the procedures in Section 8.2.5. 90/10 precision is required. If not met, the Upper Bound ($Pp_{,UB90}$) shall be used. The developer may conduct additional KPTs to ensure compliance as needed.	
Comments:	The parameters $P_{p,stat}$, $P_{p,adj}$, and $P_{p,uB90}$ are statistical parameters calculated from $P_{p,mean}$ in accordance with the applicable equations.	

Parameter ID	**ICS 22**
Data/parameter:	$U_{p,y}$
Description:	Cumulative Usage rate for technologies in activity scenario p in year y, reflecting the adoption rate and drop-off rate.
Data unit:	Fraction (%)
Purpose of data:	☒ Emissions reductions calculation
Measurement and updating frequency	Annual
Measurement methods and procedures:	Determined via Usage Surveys conducted on a representative sample of each age cohort[5]. The survey shall be conducted within a reasonable timeframe (e.g., within 6 months before the end of

[5] The usage survey determines the usage proportion for each age cohort of technologies being credited for each project scenario p. The age cohorts in the survey are established as follows:

- Participants in a usage survey with technologies in the first year of use (age0-1) shall have technologies that have been in use on average at least 0.5 years or longer.

the monitoring period), provided the sample is drawn exclusively from the finalized activity database representing that specific monitoring period.

The usage survey shall be designed to accurately capture the proportion of units still operational and the frequency/intensity of use.

There are three levels to the Usage Monitoring Requirements, each increasing in rigor and maximum claimable usage rates. To apply a higher level of usage rate, all the Monitoring Requirements from the levels beneath shall be followed. For example, if a activity claims up to 90%, the monitoring requirements provided for both the 'mandatory' and 'good practice' levels shall be complied with. The three levels and their applicability are summarized in the table below.

Level	Applicability	Claimable usage rate	Requirements
Mandatory	Mandatory	Up to maximum 75%	• Define use and non-use • In-person household usage survey • Verification of accuracy of results
Good practice	Optional	Up to maximum 90%	• Field team training and supervision • End-user training and follow-ups • Awareness campaign • all required Customer Support Actions
Best practice	Optional	Above 90%	• Continuous use monitoring

For detailed guidelines and requirements, refer to Requirements and Guidelines: Usage Rate Monitoring. Should there be a conflict in this methodology and Requirements and Guidelines: Usage Rate Monitoring, the requirements of this methodology supersede.

- Participants in a usage survey with technologies in the second year of use (age1-2) shall be conducted with technologies that have been in use on average at least 1.5 years, and so on.

Since the parameter of interest is the usage proportion for each age cohort, the sample size is defined for each age cohort shall be minimum of 30 samples for project technologies of each age cohort being credited, except where the age cohort comprises fewer than 30 units, in which case all units shall be sampled.

<table>
<tr><td></td><td colspan="2">For the purpose of this methodology;
a. Usage survey: An in-person usage survey shall be conducted in a randomly selected minimum of 50 households per each age group. The usage survey may be combined with other annual monitoring activities as long as the minimum sample size requirement i.e., 50 households per each age group is complied with.
b. Continuous monitoring: The activity technology use may be monitored in randomly selected representative sample households with temperature-sensing data loggers known as Continuous Stove Monitors (CSMs)[6] or other advanced monitoring devices which can log the operation of the activity stove i.e., recording the situation of the activity stove being used or not during any day ‘d’ of the measurement campaign, in order to determine usage rate. In such cases, how the monitored data will be used to confirm the user or non-user shall be described in the PDD at the time of validation.
The continuous use monitoring shall be conducted for a minimum of 50 households for at least 90 days, with at least 50 samples for activity stove of each age being credited.

Required Customer Support Actions (for 90% Cap):
1. Technology Suitability: Demonstrate that the activity has selected technologies and fuels that meet the cooking needs of the target population (e.g., via baseline analysis or research).
2. Participant Support Materials: Provide evidence of support activities and materials (on operation, troubleshooting, minor repairs) in the appropriate local language(s).
3. Accessible Support Channel: Ensure activity participants can access support through a commonly used, communications channel (e.g. a toll-free number, SMS/WhatsApp service, local agent).</td></tr>
<tr><td>Entity/person responsible for the measurement:</td><td colspan="2">CME/activity developer/Third party</td></tr>
<tr><td rowspan="2">Measuring instrument(s):</td><td>Type of instrument</td><td>Survey instruments, CSMs (if applicable)</td></tr>
<tr><td>Accuracy class</td><td>N/A</td></tr>
</table>

[6] CSM is a generic term for devices that monitor and log stove usage time, usually through tracking stove temperature.

	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	Adherence to recognized survey protocols. Training of enumerators and supervision. Data validation and cross-checks.	
Treatment of uncertainty	Managed through robust sampling design (90/10 precision required for the usage rate).	
Comments:	A usage parameter is derived for each age cohort and weighted to determine the overall $UP_{p,y}$.	

Parameter ID	**ICS 23**	
Data/parameter:	Presence of Stove Stacking	
Description:	Data on the presence and usage practices of baseline and other non-activity technology by activity technology end users.	
Data unit:	Fraction (%)	
Purpose of data:	☒ Activity Emissions ☒ Leakage Emissions	
Measurement and updating frequency	Annual (integrated with Usage Survey)	
Measurement methods and procedures:	Collected during the Usage Survey (ICS 22) through in-person interviews, expert observation, or CSM data. Data collection shall quantify the frequency of usage of both activity and baseline/other devices (e.g., number of meals cooked, hours used).	
Entity/person responsible for the measurement:	CME/activity developer/Third party	
Measuring instrument(s):	Type of instrument	Survey instruments, CSMs (if applicable)
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	Cross-check results with P-KPT findings (ICS 21) to ensure that the total fuel consumption measured in the P-KPT accurately reflects the observed stove stacking practices. Cross-check with independent studies specific to the activity region.	

Treatment of uncertainty	N/A
Comments:	Crucial for verifying the internalization of rebound effects (Section 8.2 |) and informing the Leakage assessment (Section b)

Parameter ID	**ICS 24**	
Data/parameter:	$LE_{Market,y}$	
Description:	Market leakage due to behavioural effects	
Data unit:	tCO_2e/yr	
Purpose of data:	☒ Leakage emissions	
Measurement and updating frequency	Biennial (if option 3 selected).	
Measurement methods and procedures:	Calculated via Option 2 (2% default deduction based on (BEy - AEy)) or monitored via Option 3 (Detailed Assessment) as specified in Section 9.3.	
Entity/person responsible for the measurement:	CME/activity developer	
Measuring instrument(s):	Type of instrument	Survey instruments (if applicable)
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	Data validation and cross-checks with secondary literature where applicable..	
Treatment of uncertainty	Conservatively addressed via defaults or robust sampling.	
Comments:	N/A	

Parameter ID	**ICS 25**
Data/parameter:	$DAF_{NetZero,y}$
Description:	Downward Adjustment Factor for Ambition
Data unit:	Fraction (%)
Purpose of data:	☒ Baseline emissions (Adjustment)

Measurement and updating frequency	Annual (based on the calendar year of the monitoring period).	
Measurement methods and procedures:	Sourced from the latest version of the GS4GG Methodology Tool: 05, corresponding to the host country and the monitoring year.	
Entity/person responsible for the measurement:	CME/activity developer	
Measuring instrument(s):	Type of instrument	NA
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	VVB verification that the correct DAF value has been applied based on the host country and monitoring period year.	
Treatment of uncertainty	N/A	
Comments:	N/A	

Parameter ID	**ICS 26**
Data/parameter:	$HE_{ind/def}$
Description:	Hawthorne effect adjustment factor
Data unit:	Fraction (%)
Purpose of data:	☒ Baseline emissions (Adjustment)
Measurement and updating frequency	Annual (based on the calendar year of the monitoring period).
Measurement methods and procedures:	The applicable value shall be selected according to the monitoring period vintage and Table 9.

Phase	Applicable Vintage	Default Factor ($HE_{default}$)
Phase 1	2026 & 2027	0.90
Phase 2	2028 & 2029	0.85
Phase 3	2030 or after	0.75

Entity/person responsible for	CME/activity developer

the measurement:		
Measuring instrument(s):	Type of instrument	NA
	Accuracy class	N/A
	Calibration requirements	N/A
	Location	N/A
QA/QC procedures:	VVB verification that the correct HE value has been applied based on the monitoring period year.	
Treatment of uncertainty	Uncertainty is conservatively addressed through methodology default values.	
Comments:	N/A	

14.4 | QA/QC and Data Management

14.4.1 | **Data Validation:** The activity developer shall establish procedures for the validation of monitored data, including cross-checking manual survey entries against dMRV telemetry or distribution records, identifying statistical outliers, and investigating logical discrepancies in fuel consumption patterns. Arbitrary exclusion of data points is strictly prohibited.

14.4.2 | **Enumerator Training:** All field staff conducting KPTs or usage surveys shall undergo documented training on standardized weighing protocols, survey neutrality (to minimize social desirability bias), and data privacy compliance. .

14.4.3 | **KPT QA/QC:**

a. **Protocols:** All KPTs shall adhere to standardized, internationally recognized KPT protocols (e.g., Clean Cooking Alliance protocol or equivalent).

b. **Training:** Enumerators conducting KPTs and surveys shall receive rigorous training.

c. **Calibration:** All measurement equipment (e.g., weighing scales, moisture meters) shall be calibrated according to the manufacturer's instructions or relevant standards. Weighing scales shall be checked frequently (at least weekly during field campaigns) using a certified calibration weight. Calibration records shall be maintained and available for verification.

   i. If the calibration check reveals an error of ≤1%, the data is accepted as is.

   ii. If the calibration check reveals an error > 1% but ≤ 5%, the recorded data is not discarded; instead, the measured fuel

weights shall be mathematically corrected by applying the exact percentage of the identified variance in the most conservative direction.

iii. If the error is > 5%, all data collected since the last successful check shall be strictly excluded from the analysis.

d. **Data Cross-Checks:** Procedures for cross-checking data entry and identifying outliers shall be implemented. Outliers (e.g., data points beyond 1.5 times the interquartile range (IQR)) may only be excluded if there is a clear, documented reason (e.g., data entry error, documented unusual event). All excluded data shall be retained with an explanation.

14.4.4 | **Corrective Actions for Data Gaps:** In the event of equipment failure or irretrievable data loss, missing data shall be substituted using the most conservative mathematical approach. For parameters contributing to baseline emissions (e.g., Up,y), a value of zero (0) shall be assumed for the missing period. For parameters contributing to activity emissions (e.g., $Pp,mean$), the highest historically recorded value or the Upper Bound of the confidence interval shall be applied, provided a verifiable valid justification is available for data gap.

14.5 | Sampling requirements

14.5.1 | **General Standards:** All sampling efforts (B-KPT, P-KPT, and Usage Surveys) shall be conducted in accordance with the latest version of the CDM Standard: Sampling and surveys for CDM project activities and programme of activities or the equivalent GS4GG/A6.4 standard if made available. A comprehensive Sampling Plan shall be developed.

14.5.2 | **Confidence and Precision Targets:** A 90/10 confidence/precision level (90% confidence interval, 10% margin of error) is the mandatory requirement for determining mean values ($Pb,mean$, $Pp,mean$, Up,y). If the required precision is not achieved ex-post, the activity developer is explicitly permitted to conduct supplementary sampling; otherwise, the results shall be adjusted conservatively utilizing the lower or upper bound of the confidence interval as specified in Sections 7 and 8.

14.5.3 | **Minimum Sample Size:** A minimum sample size of 50 households is required for sampling of B-KPT, P-KPT, and Usage Surveys.

14.5.4 | **Age-Cohort Stratification:** To accurately account for performance degradation and technology mortality over time, all ex-post sampling (Usage Surveys and P-KPTs) shall be structurally stratified by the age cohort of the device (e.g., Year 1 devices, Year 2 devices). The final parameter values utilized in the emission reduction equations shall be calculated as the weighted average across all operational age cohorts.

14.5.5 | **Digital MRV (dMRV) Sampling Substitution:** If an activity developer utilizes objective, continuous dMRV telemetry (e.g., smart meters, SUMs)

on a statistically representative sample of the operational fleet (meeting the 90/10 rule), the telemetry data shall supersede and replace the requirement to conduct manual annual usage surveys or manually applied Hawthorne Effect adjustments.

15| MONITORING REQUIREMENTS FOR ACTIVITIES WITH REVERSAL RISKS

15.1 | Exemption from Continuous Reversal Monitoring

15.1.1 |As established in Section 12.1 | of this methodology, decentralized thermal energy activities generate mitigation outcomes via the avoidance of emissions (not sequestration) and operate under the "No Control" exemption regarding the physical biomass reservoir. Consequently, the physical reversal of credited mitigation outcomes is structurally impossible. The activity developer is exempt from continuous Reversal Risk monitoring requirements and is not required to contribute to or monitor a Reversal Risk Buffer Pool.

15.2 | Dynamic Baseline Management

15.2.1 |The risk of macro-level non-permanence (depletion of the baseline carbon stock) is managed structurally rather than through continuous ex-post monitoring. The activity developer shall manage this risk exclusively through the mandatory ex-ante reassessment of the baseline fuel scenario, the Catastrophic Disturbance Check, and the updating of the fNRB parameter at each crediting period renewal, in accordance with Section 12.2 | and Section 17 |.

16| APPLICATION TO PROGRAMME OF ACTIVITIES

16.1 | General Requirements

16.1.1 |This methodology is applicable to Programmes of Activities (PoA).

16.1.2 |The CME shall define clear, objective eligibility criteria for the inclusion of VPAs in the PoA Design Document (PoA-DD). These criteria shall ensure that each VPA explicitly meets all Applicability Conditions defined in Section 3.2 |.

16.2 | Additionality and Baselines at the VPA Level

16.2.1 |**Additionality:** Additionality shall be demonstrated at the VPA level. A VPA may utilize the Positive List (Deemed Additionality) defined in Annex 4 provided the VPA explicitly meets all geographic, scale, and policy criteria at the time of its inclusion in the PoA.

16.2.2 |**Baseline Scenarios:** If the PoA encompasses heterogeneous VPAs (e.g., targeting different geographic regions, utilizing different primary baseline fuels, or serving socio-economically distinct demographics), the baseline scenario shall be determined and justified individually for each homogenous VPA grouping in accordance with Section 7 |.

16.3 | Monitoring and Cross-VPA Sampling

16.3.1 |The CME shall establish a comprehensive monitoring system detailing data collection, GDPR-compliant archiving, and verification across all VPAs.

16.3.2 |**Sampling Across VPAs:** Cross-VPA sampling for P-KPTs and Usage Surveys is permitted, provided the CME demonstrates that the sampled population is homogeneous and the sampling plan meets the requirements of Section 14.5 |and the relevant Sampling Standard. A cross-VPA sampling is not allowed across groups larger than 10 VPAs, unless specific justification for homogeneity across a larger group is provided and validated by the VVB.

17| RENEWAL OF CREDITING PERIOD

17.1 | Crediting Period Renewal Requirements

17.1.1 |The renewal of the crediting period (every 5 years) shall be conducted in accordance with the latest GS4GG requirements. At the time of renewal, the activity shall comply with the latest version of this methodology.

17.2 | Reassessment of the Baseline Scenario

17.2.1 |The baseline scenario for all activities applying this methodology shall be formally reassessed at each crediting period renewal. In the event of a contradiction regarding baseline reassessment schedules, the specific requirements of this methodology shall explicitly supersede any exemptions provided in the overarching Community Services Activity Requirements (CSA).

17.3 | Update of Fixed Ex-Ante Parameters

17.3.1 |**Baseline Fuel Consumption (Mandatory):** The baseline fuel consumption parameters shall be re-established. This requires conducting new Baseline KPTs (**ICS 15**) for the subsequent crediting period. If the activity has achieved a high adoption rate within the activity boundary such that a representative internal baseline sample cannot be established, the procedures below shall be followed.

17.3.2 |**Procedures for B-KPT Update in Saturated Activity Areas:** If the project activity has achieved high market penetration (e.g., >95%) or total saturation (100%) within the defined activity boundary (e.g., a specific

commune or village), identifying a representative sample of baseline technology users internally is not feasible.

17.3.3 | In such cases, the baseline fuel consumption shall be updated using the hierarchical approach defined below. The activity developer shall justify the selected approach, and the VVB shall validate its appropriateness.

17.3.4 | **Prohibited Approach:** Reversion Testing. Asking activity participants to revert to using baseline technologies (e.g., reconstructing three-stone fires) for the purpose of the B-KPT is not permitted.

17.3.5 | **Hierarchical Approach for Baseline Update:**

17.3.5.1 | **Preferred Approach: Identification and Testing of a Proxy Control Group**: The activity developer shall identify a proxy Control Group located outside the immediate activity boundary that is statistically comparable to the activity population and continues to use the baseline technologies.

a. **Criteria for Proxy Control Group Selection:** The Proxy Control Group shall be comparable to the activity group in all material aspects that influence fuel consumption patterns. This includes, but is not limited to:

   i. **Socio-economic and demographic characteristics** (e.g., income levels, household size, livelihood activities).

   ii. **Geographic and environmental conditions** (e.g., climate, altitude, agro-ecological zone).

   iii. **Fuel availability and accessibility** (e.g., type of fuel used, distance to source, market cost, reliance on purchased vs. collected fuel).

   iv. **Cooking practices and diet** (e.g., types of meals prepared, cooking frequency).

   v. **Baseline Technology Type** (The technology predominantly used in the proxy group shall be the same as the baseline technology identified for the activity).

   vi. **Absence of Interventions:** The proxy group shall not be significantly impacted by other similar clean cooking interventions or by spillover effects from the activity.

b. **Demonstration of Comparability:** The activity developer shall provide a rigorous, quantitative demonstration that the Proxy Control Group is statistically comparable to the activity population.

c. **Data Comparison:** Comparability shall be established by comparing the key characteristics of the Proxy Control Group (measured currently) against the characteristics of the Activity area measured at the start of the preceding crediting period (e.g., via the previous Baseline Scenario Survey, ICS 7).

d. **Statistical Methods:** A survey shall be conducted in the proposed Proxy Control Group. Statistical analysis shall demonstrate no statistically significant difference between the groups across the key characteristics (i-iv above).

e. **Execution of B-KPT:** Once comparability is validated, the B-KPT shall be conducted within the Proxy Control Group, following all requirements of this methodology (Section 14.5, Annex 2), including the 90/10 precision standard. The results shall establish the updated baseline fuel consumption (Pb_{mean}) for the renewed crediting period.

f. **Validation:** The VVB shall rigorously validate the selection of the Proxy Control Group and the demonstration of comparability. If comparability cannot be demonstrated, this approach cannot be used.

17.3.5.2 | **Fallback Approach: Conservative Carry-Forward with Autonomous Improvement Factor (AIF)**: This approach may only be used if the activity developer provides verifiable evidence that identifying a suitable Proxy Control Group (Approach 1) is infeasible (e.g., due to widespread adoption of improved technologies in surrounding regions, or unique characteristics of the activity area that cannot be matched). The justification for infeasibility shall be validated by the VVB. In this case, the activity developer may carry forward the Adjusted Baseline Fuel Consumption (Pb,adj) established at the start of the previous crediting period. However, this value shall be adjusted by an Autonomous Improvement Factor (AIF) to conservatively account for improvements in energy efficiency or changes in fuel availability that likely would have occurred in the absence of the activity over the preceding 5 years.

a. **Application of Autonomous Improvement Factor (AIF):** A mandatory, conservative AIF of 5% per 5-year crediting period shall be applied.

$$P_{b,mean,renewal} = P_{b,adj\ (Previous\ CP)} \times (1 - AIF)$$

Where AIF = 0.05

17.3.5.3 | This adjusted value $P_{b,mean,renewal}$ shall then be used as the basis for the baseline calculation for the renewed crediting period, subject to the standard uncertainty adjustments (Section 7.4.1).

Note: If the activity utilized the MSL/Default baseline (Option B or C) in the previous crediting period, this fallback approach (AIF) is not applicable, and the activity shall continue to use the MSL/Default baseline for the renewed crediting period.

17.3.6 | **fNRB (Mandatory):** The fNRB value (ICS 20) shall be updated using the latest available data and versions of the approved standardized tools or updated activity-specific assessment.

17.4 | Reassessment of Additionality

17.4.1 |The Regulatory Analysis (Section 6.3 |) shall be updated. If new, fully enforced, and funded legal mandates have come into force that legally require the activity, the crediting period shall not be renewed.

17.4.2 |**Ongoing Financial Need (OFN):** The activity developer shall demonstrate OFN in accordance with Section 6.8 |.

Annex -1| Suppressed Demand and Satisfactory Level of Service

A 1.1| Introduction and Definitions

A 1.1.1| This annex provides the definitions, applicability criteria, and procedures for accounting for suppressed demand in the baseline scenario, as referenced in Section 7.3.5 | of the methodology.

A 1.1.2| **Suppressed Demand:** A situation where the demand for energy services (in this context, thermal energy for cooking, heating, or other uses) is below the level that would be required to meet basic human needs or a satisfactory level of service, due to constraints such as poverty, lack of access to fuel, or affordability.

A 1.1.3| **Minimum Service Quality Standards (MSQS):** A quality threshold for an intervention that surpasses the mere fulfilment of basic human needs (BHN) or minimum service levels (MSLs), ensuring a significant contribution to sustainable, low-carbon development.

A 1.1.4| **Minimum Service Level (MSL):** A service level capable of meeting basic human needs.

A 1.2| Applicability

A 1.2.1| The application of a suppressed demand baseline is strictly limited to:

a. Micro-scale activities.
b. Small-scale activities.

A 1.2.2| Large-scale activities, or activities implemented in large commercial and/or industrial premises, are not permitted to claim suppressed demand under this methodology.

A 1.3| Demonstration of Suppressed Demand

A 1.3.1| To utilize a suppressed demand baseline, the activity developer shall provide verifiable evidence that the target population, or a specific cluster of users within the activity population, is deprived of a Satisfactory Level of Service regarding thermal energy access.

A 1.3.2| Evidence shall demonstrate that the pre-project activity consumption is below the SLS due to identifiable constraints. Acceptable evidence includes:

a. **Socio-economic Data:** Official poverty statistics, income level assessments, or data demonstrating high fuel expenditure relative to income in the target area.
b. **Baseline Surveys:** Data from the Baseline Scenario Survey (ICS 7) documenting unmet basic needs (e.g., insufficient cooked meals, inability to heat water for hygiene, inadequate space heating) directly attributable to energy constraints.

c. **Credible Literature and Reports:** Project activity-relevant reports by qualified entities (e.g., NGOs, academic institutions, multilateral agencies) or credible published literature specific to the activity area documenting energy poverty.

A 1.4| Determination of the Minimum Service Level (MSL)

A 1.4.1| When suppressed demand is demonstrated, the baseline fuel consumption shall be set at the Minimum Service Level (MSL).

A 1.4.2| The MSL shall be based on the following conservative default values (Parameter (ICS 14, 15):

a. Wood: 0.50 tonnes per capita per year.
b. Charcoal: 0.13 tonnes per capita per year.

A 1.4.3| The household/unit level MSL (PM_{SL}) is calculated by multiplying the per capita default by the average baseline household size (HN_b) (Parameter ICS 14).

A 1.5| Procedures for Baseline Setting under Suppressed Demand

A 1.5.1| If suppressed demand is claimed, the Mean Baseline Fuel Consumption ($P_{b,mean}$) used in the calculation of Unadjusted Emission Reductions ($BE_{unadj,y}$) shall be equal to the MSL (PM_{SL}).

A 1.5.2| Requirement for B-KPT: Even when suppressed demand is claimed, a Baseline KPT (B-KPT) shall still be conducted. The B-KPT serves to:

a. Verify the baseline technology and fuel use patterns.
b. Corroborate the evidence of suppressed demand by demonstrating that the measured historical consumption is indeed below the claimed MSL.
c. The B-KPT under suppressed demand shall meet the same sampling requirements as a standard B-KPT (90/10, minimum n ≥ 50 per stratum). Where these requirements cannot be met despite reasonable effort, suppressed demand shall not be claimed and ($P_{b,mean}$) shall be set to measured consumption.

A 1.5.3| Adjustment for Conservativeness: As required by suppressed demand requirements, the baseline is based on the MSL default, a mandatory 5% deduction is applied to ensure conservativeness. The Adjusted Baseline Fuel Consumption ($P_{b,adj}$) is therefore 95% of the MSL.

Annex -2| Complementary Guidelines for Kitchen Performance Testing (KPT)

A 2.1| Introduction and Purpose

A 2.1.1| This annex provides mandatory guidelines for conducting Kitchen Performance Tests (KPTs), referred to in this methodology as Baseline KPTs (B-KPT) and Project KPTs (P-KPT).

A 2.1.2| The purpose of KPTs is to quantify the actual fuel consumption and performance of baseline and activity technologies under real-world field conditions, capturing the influence of local practices, fuel characteristics, and user behaviour. KPTs are mandatory for Intervention Types A, B, and C.

A 2.2| Protocols and Standards

A 2.2.1| KPTs shall be conducted following the latest version of internationally recognized rigorous protocols. The preferred standard is the KPT protocol supported by the Clean Cooking Alliance (CCA) (the most recent version) or equivalent standards aligned with the principles of ISO 19867-3.

A 2.2.2| The specific protocol used shall be documented in the PDD/VPA-DD and the Monitoring Report. Any deviations from the standard protocol shall be justified and validated by the VVB.

A 2.3| KPT Design and Implementation

A 2.3.1| **Representativeness:** The KPT design shall ensure that the measured fuel consumption is representative of typical usage patterns, fuel types, moisture content, and environmental conditions (e.g., seasonality) of the target population. To ensure precise demographic matching, the initial Activity KPT (P-KPT) may be conducted concurrently with the Baseline KPT (B-KPT) prior to the first verification.

A 2.3.2| **Fuel Provision Restrictions:** Providing fuel to households during the KPT can introduce substantial bias and should be avoided in most cases.

In exceptional situations where households normally collect fuel daily and cannot store a full day's fuel in advance, activity developer may provide fuel for the KPT only if this situation applies to a significant portion (e.g., >40%) of the KPT sample, and the following conditions are met:

a. The household shall be clearly identified in the monitoring data.
b. A mandatory 20% discount shall be applied to the fuel consumption measured for that household during the Baseline KPT (B-KPT) to mitigate potential upward bias in fuel consumption
c. The amount of fuel provided shall be reasonable (e.g., not exceeding 30 MJ/person/day) and documented.

d. If fuel is provided for the B-KPT, it shall also be provided consistently for the Project KPT (P-KPT) for that household (if a paired sampling approach is used).

A 2.3.3| **Duration:** The duration of the KPT shall be sufficient to capture typical variations in cooking behaviour and stabilize the results. A minimum duration of 3 days is required, with 5-7 days recommended for higher accuracy. In the event of unavoidable field interruptions (e.g., severe weather or unexpected household travel), non-consecutive measurement days are permitted, provided the total required duration of valid, measured cooking days is ultimately captured.

A 2.3.4| **Sampling:** Sampling for KPTs shall adhere to the requirements detailed in Section 14.5 of the methodology, targeting the required precision levels (90/10 depending on the Intervention Type).

A 2.3.5| **Measurement Procedures:**

a. Fuel consumption shall be measured using calibrated weighing scales.

b. The characteristics of the fuel (type, source) shall be recorded. If wood is used, the moisture content shall be measured using calibrated moisture meters via a random, representative sample (e.g., 3-5 pieces) of the household's daily fuel pile, rather than requiring the measurement of every individual piece of wood.

c. In the event of sudden weather impacts (e.g., unexpected rainfall during the testing period), the affected data shall not be automatically discarded. Activity developers are formally permitted to utilize standard mathematical moisture-content conversions (calculating the dry-wood equivalent mass) based on concurrent field measurements utilizing calibrated moisture meters.

d. The Net Calorific Value (NCV) used in calculations shall be appropriate for the fuel measured (e.g., wet basis or dry basis), consistent with the measurement method. If local fuel moisture content deviates significantly from the assumptions used in IPCC default NCVs, adjustments based on measured moisture content may be necessary, subject to validation.

A 2.3.6| Standardized Seasonal Weighting:

a. When KPTs are conducted across different climatic seasons (e.g., wet and dry seasons, or heating and non-heating seasons) to capture annual variance, the empirical data shall be proportionally weighted to calculate an accurate annualised average. The annualised fuel consumption ($P_{annualised}$) shall be mathematically weighted based on the documented duration (in days) of the respective seasons within the target region.

- Formula: $P_{annualised} = \Sigma (P_{season,i} \times (\text{Days season,i} / 365))$

A 2.4| Internalization of Rebound Effects and Stove Stacking

A 2.4.1| As mandated by Section 8.2 of the methodology, the P-KPT design is critical for internalizing rebound effects and stove stacking (users continuing to use baseline stoves alongside the activity stove).

A 2.4.2| The P-KPT shall monitor the total relevant fuel consumption by the sampled user related to the energy service provided. This includes fuel used in the activity technology AND any parallel use of baseline or other stoves for the same purpose.

A 2.4.3| Failure to design the P-KPT to capture total fuel consumption (i.e., measuring only the fuel used in the activity stove while ignoring parallel use of other stoves) constitutes a failure to internalize the rebound effect, triggering the mandatory leakage deduction (Section 9.3, Option 2) unless Option 3 is rigorously applied.

A 2.5| Paired vs. Unpaired Sampling

A 2.5.1| The activity developer may choose between paired or unpaired sampling approaches. The choice shall be justified in the Sampling Plan (Section 14.5.1).

A 2.5.2| **Paired Sampling:** The same households/units are tested before (B-KPT) and after (P-KPT) the introduction of the activity technology. This approach typically reduces variance and may require smaller sample sizes to achieve the required precision. However, it requires careful management to avoid confounding factors (e.g., seasonal changes between tests).

A 2.5.3| **Unpaired (Independent) Sampling:** The B-KPT and P-KPT are conducted on different, but statistically representative, samples of the target population. This approach is often logistically simpler but typically requires larger sample sizes.

A 2.6| Quality Assurance and Quality Control (QA/QC)

A 2.6.1| Robust QA/QC procedures, as detailed in Section 14.4, shall be implemented during all KPT activities. This includes:

a. **Standard Operating Procedures (SOPs):** Development of detailed SOPs for field teams.
b. **Training:** Comprehensive training for enumerators, with regular supervision and spot checks.
c. **Equipment Calibration:** Activity developers shall verify the accuracy of their digital or mechanical field scales prior to and during the monitoring campaign using universally recognized, standardized reference weights (e.g., standard M1 class test weights). Third-party accredited laboratory calibration is only required periodically for the primary reference weights themselves. Calibration records shall be maintained.
d. **Internal, Auditable QA/QC:** Activity developers may utilize internal QA/QC personnel to oversee testing, provided these

individuals are entirely distinct from the primary field enumerators collecting the data. All internal QA/QC processes shall be highly auditable, requiring the submission of immutable digital evidence, including time-stamped, geo-tagged photographs of the weighing process and scale readouts, to the VVB.

e. **Data Validation:** Use of standardized forms or digital tools with built-in validation checks, and systematic procedures for data cleaning and outlier analysis.

Annex -3| Activity Preparation and Monitoring Schedule

Table A.3.1: The following table summarizes the monitoring schedule for the data and parameters defined in Section 14 of the methodology.

ID	Parameter Description	Minimum Frequency	Stage (Ex-Ante / Ex-Post)	Key References
Data and Parameters Not Monitored (Section 14.2)				
ICS 1	Activity technology description and thermal efficiency	Once	Ex-Ante	Sec 14.2, 3.2.1
ICS 2	Avoidance of double counting (Participants)	Before 1st Verification and on an ongoing basis for subsequent batches during the crediting period	Ex-Ante	Sec 14.2, 3.2.6
ICS 3	Avoidance of double counting (Other Actions)	At Design Certification. (and VPA inclusion/design change)	Ex-Ante	Sec 14.2, 3.2.6
ICS 4	Indoor air pollution (IAP) Assessment	Once	Ex-Ante	Sec 14.2, 3.2.7
ICS 5	Regulatory framework analysis	At Design Certification (and CP renewal)	Ex-Ante	Sec 14.2, 6.3
ICS 6	Expected technical life of activity technology	Once (at registration or distribution)	Ex-Ante	Sec 14.2, 3.2.5
ICS 7	Baseline Scenario Survey Results	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 7.3.1
ICS 8	EFb,f,CO2 (Baseline CO_2 Emission Factor)	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 7.3.7
ICS 9	$EFb,f,non-CO2$ (Baseline non-CO_2 Emission Factor)	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 7.3.7
ICS 10	$EFp,f,CO2$ (Activity CO_2 Emission Factor)	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 8.2.4

ICS 11	$EFp,f,non-CO2$ (Activity non-CO2 Emission Factor)	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 8.2.4
ICS 12	$NCVb,fuel$ (Baseline Net Calorific Value)	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 7.3.7
ICS 13	$NCVp,fuel$ (Activity Net Calorific Value)	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 8.2.4
ICS 14	HNb (Household size baseline)	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 7.4.2
ICS 15	$Pb,mean$ (Baseline Fuel Consumption - B-KPT or Default/MSL)	At Design Cert. (and CP renewal)	Ex-Ante	Sec 14.2, 7.3.6
ICS 16	$PMSL,capita$ (Minimum Service Level Default)	Once (Methodology default)	Ex-Ante	Sec 14.2, 7.4.2
ICS 17	WCCF (Wood-to-Charcoal Conversion Factor)	Once (Methodology default)	Ex-Ante	Sec 14.2, 7.3.7
Data and Parameters Monitored (Section 14.3)				
ICS 18	Notification to end-users	Continuous (spot-checked at verification)	Ex-Post	Sec 14.3, 3.2.6
ICS 19	Nb,p,y (Number of operational technology-days)	Continuous/Annual	Ex-Post	Sec 14.3, 14.1.3
ICS 20	$fNRB,b,y$ (Fraction of Non-Renewable Biomass)	Fixed Ex-Ante OR Biennial (Mandatory at CP renewal)	Ex-Post/Ex-Ante	Sec 14.3, 7.3.7
ICS 21	$Pp,mean$ (Activity Fuel Consumption - P-KPT)	Biennial	Ex-Post	Sec 14.3, 8.2.1
ICS 22	Up,y (Usage Rate)	Annual	Ex-Post	Sec 14.3, 14.5.3
ICS 23	Presence of Stove Stacking	Annual (Integrated with Usage Survey)	Ex-Post	Sec 14.3, 8.2.2
ICS 24	$LEMarket,y$ (Market Leakage)	Biennial (if Option 3 selected)	Ex-Post	Sec 14.3, 9.3
ICS 25	$DAFnetZero,y$ (Downward Adjustment Factor)	Annual (Sourced from Tool)	Ex-Post	Sec 14.3, 7.4.3

ICS 26	$HEind/def$ (Hawthorne effect adjustment factor)	Annual (based on vintage phase)	Ex-Post	Sec 14.3, 10.1

Annex -4| Methodology-Level Additionality and Barrier Analysis for Decentralized Thermal Energy Activities

A 4.1| Objective and Scope of Exemption

A 4.1.1| A comprehensive, methodology-level barrier and additionality analysis has been conducted to evaluate the baseline penetration and autonomous adoption of improved and clean cooking technologies. The analysis demonstrates that for specific decentralized thermal energy activities (e.g., improved cookstoves) operating in highly vulnerable contexts, autonomous implementation is not a credible business-as-usual (BAU) scenario. Based on this robust empirical foundation, project activities that meet all the criteria specified in Section A4.6 of this Annex are deemed automatically additional. Such activities are exempt from the requirement to conduct a separate, activity-specific investment or barrier analysis.

A 4.2| Theoretical Framework for Decentralized Additionality

A 4.2.1| Traditional additionality tools were designed for large, centralized infrastructure where additionality hinges on a singular, upfront investment decision. Conversely, decentralized household energy activities rely on the aggregate adoption behaviours of thousands of individual households. Consequently, additionality for these activities shall be evaluated based on the likelihood of autonomous, household-level procurement of the technology in the absence of carbon-financed subsidization and distribution networks (Gill-Wiehl, Hogan, & Haya, 2026). This methodology-level analysis evaluates the prevailing financial, market, and behavioural barriers to autonomous adoption to establish a standardized Positive List.

A 4.3| Extensive Literature Review: Barriers to Autonomous Adoption (2015–2026)

A 4.3.1| **Empirical Evidence on Autonomous Adoption Rates (The Additionality Baseline):** Recent empirical scholarship provides quantitative evidence isolating the rate at which households adopt efficient stoves without the financial intervention of a carbon offset program. A foundational study by Gill-Wiehl, Hogan, and Haya (2026) conducted a systematic review of randomized control trials (RCTs) published between 1970 and 2023, analysing data from rural areas in Ghana, India, Peru, Senegal, and Uganda, alongside primary stepped-wedge RCT data from rural Tanzania.

A 4.3.2| By specifically examining the control groups—households that did not receive the subsidized intervention but lived in identical socio-economic conditions—the authors quantified the exact baseline rate of autonomous

adoption. The findings were definitive: the average annual rate of non-additionality (i.e., households autonomously procuring an efficient stove) was exceptionally low at **4.2%**, weighted for sample size and normalized for time.

A 4.3.3| A breakdown of the evaluated RCTs highlights the extreme unlikelihood of autonomous adoption in rural contexts absent government intervention:

a. **Senegal:** Bensch and Peters (2015) reported a 0.7% annual non-additionality rate for improved firewood mud stoves.
b. **Peru:** Commodore et al. (2013) observed a 0% non-additionality rate over a 1-year study period.
c. **Uganda:** Guzmán et al. (2020) noted a 3.43% annual rate of control households acquiring an improved stove.
d. **Tanzania:** Primary data collection by Gill-Wiehl et al. (2026) revealed an autonomous adoption rate of approximately 1% among rural households over a one-year period.

A 4.3.4| The significant outlier in this analysis was rural India (Islam et al., 2022), which exhibited a 15.0% annual non-additionality rate. However, the authors noted this higher rate was directly attributable to the presence of the Pradhan Mantri Ujjwala Yojana (PMUY), a massive government policy providing fully subsidized liquid petroleum gas (LPG) connections to below-poverty-line households. Excluding contexts with aggressive, fully funded government subsidies, the empirical data demonstrates that autonomous adoption in rural areas approaches zero.

A 4.4| Financial and Economic Barriers

A 4.4.1| The near-zero organic adoption rate observed in the empirical literature is driven by a profound affordability gap. In rural areas of Least Developed Countries (LDCs) and Lower-Middle-Income Countries (LMICs), traditional biomass (such as deadwood) is typically gathered rather than purchased (Bailis et al., 2015). While the opportunity cost of time is high (often borne by women and children), the direct financial cost of the fuel is zero.

A 4.4.2| Because the health and environmental externalities of open-fire cooking are not priced into the market, there is no purely economic incentive for a household to shift from a "free" gathered fuel to a monetized efficient stove. Without the monetization of fuel savings, the payback period for an efficient stove effectively becomes infinite for a subsistence household. Carbon finance acts as the critical, and often only, mechanism to buy down the capital expenditure (CAPEX) of the stove and establish the required distribution infrastructure.

A 4.4.3| These quantitative findings corroborate earlier political economy research. Purdon (2015) conducted an investigation of carbon finance across Tanzania and Uganda, finding that NGO-led cookstove activities operating in rural areas exhibited high additionality. In the observed villages, there was zero autonomous adoption of improved stoves outside the activity

boundary, and the activities faced immediate closure once carbon funding ceased, proving absolute financial dependency.

A 4.4.4| **The Urban vs. Rural Dichotomy and Supply Chain Barriers:** While the literature robustly defends the additionality of rural interventions, it also highlights elevated non-additionality risks in urban centres and more developed economies.

A 4.4.5| Lambe et al. (2015) and Cames et al. (2016) demonstrated that in urban and peri-urban environments, populations have relatively higher disposable incomes and actively purchase their cooking fuels (e.g., charcoal) in cash-based markets. In these settings, the financial payback period for an improved charcoal stove can be very short, as upfront costs are quickly offset by daily fuel savings. Consequently, commercial business models for improved stoves can occasionally achieve viability independent of carbon finance in urban areas. Furthermore, the supply chain infrastructure to deliver appliances is naturally present in urban centres, whereas establishing "last-mile" distribution in rural LDCs requires massive upfront capital that commercial markets will not provide without guaranteed carbon revenues.

A 4.5| Conclusions and Justification for the Positive List

A 4.5.1| The synthesis of the peer-reviewed literature establishes a clear, empirically validated dichotomy. In rural areas of LDCs and LMICs lacking government subsidies, compounding economic and infrastructural barriers suppress the autonomous adoption of efficient cookstoves to statistically negligible levels (averaging 4.2%). In these contexts, carbon finance is not merely a supplementary revenue stream; it is the fundamental prerequisite for activity viability, meaning implementation is not a credible business-as-usual scenario.

A 4.5.2| Therefore, it is methodologically rigorous and highly conservative to grant automatic additionality (a Positive List) to micro- and small-scale activities operating in highly vulnerable, rural, and LDC contexts. Conversely, activities in urban areas of middle-income countries, large-scale commercial deployments, or regions with active government subsidies face a materially higher risk of non-additionality and shall be subject to strict, activity-specific barrier or investment analyses.

A 4.6| Positive List Criteria for Deemed Additionality

A 4.6.1| An activity is deemed additional and exempt from conducting a activity-specific Investment Analysis or Barrier Analysis if it simultaneously meets all the criteria specified in Table A.4.1 below.

Table A.4.1: Positive List Criteria for Deemed Additionality

Criterion	Requirement	Scientific & Methodological Justification

1. Geographic Location & Socio-Economic Context	The project activity shall be physically located in a country or region that meets one of the following conditions at the time of the activity's first submission for listing: a) Is classified as a Least Developed Country (LDC) or a Small Island Developing State (SIDS);OR b) Is classified as a Lower-Middle-Income Country (LMIC) (as per the most recent World Bank classification) AND the activity targets exclusively rural areas or Special Underdeveloped Zones (SUZ) officially recognized by the national government.	Justification: Aligns with empirical findings (Gill-Wiehl et al., 2026; Purdon, 2015) proving autonomous adoption rates average ≤4.2% in rural/vulnerable contexts. Excludes urban LMIC areas where commercial fuel markets may drive baseline adoption without carbon finance (Lambe et al., 2015).
2. Activity Scale	The project activity shall be classified as Micro-scale (≤10,000 tCO_2e per year) or Small-scale(≤180 GWh_{th}/yr energy savings). Large-scale activities are universally ineligible for this Positive List.	Justification: Ensures that large, well-capitalized commercial operations (which have access to traditional debt/equity markets) are subject to rigorous financial scrutiny, reserving the Positive List for activities facing acute capital access barriers.
3. Regulatory & Subsidy Absence	The activity developer shall demonstrate (via the Regulatory Surplus Analysis, Section 6.3) that the target population is not the recipient of an active, comprehensively funded government clean cooking subsidy program (e.g., full capital cost reimbursement) addressing the same baseline fuel.	Justification: Ensures the activity is not claiming emission reductions that would have otherwise been achieved by host-country policy interventions, such as those observed in India's PMUY program (Islam et al., 2022).

A 4.7| Validity Period

A 4.7.1| This positive list for deemed additionality shall have a validity period of five (5) years from the date of the publication of Version 5.0 of this methodology. Following this period, the criteria and the underlying scientific literature shall be subject to review by the Secretariat to ensure continued empirical relevance against evolving macroeconomic conditions.

A 4.8| References

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Contact Details

The Gold Standard Foundation
International Environment House 2
Chemin de Balexert 7-9
1219 Châtelaine Geneva, Switzerland
Tel +41 22 788 70 80
Email help@goldstandard.org